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FIRST-ORDER LEVELING IN OREGON

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BY

HENRY G. AVERS
Mathematician

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FIRST-ORDER LEVELING IN OREGON

By HENRY G. AVERS, *Mathematician, U. S. Coast and Geodetic Survey*

GENERAL STATEMENT

This volume contains the descriptions and standard elevations of all bench marks in the State of Oregon that were established by first-order leveling. The results of the older work, previously published in Bulletin No. 556 of the United States Geological Survey and in Special Publication No. 18 of the United States Coast and Geodetic Survey, are reprinted here with corrections and additions. There are also included the elevation of the top of the rail in front of the depots where the lines were run along the railroad.

The descriptions and elevations of a few bench marks in adjacent States near the Oregon State line, that have not been printed in any publication of this bureau, are given in this publication for the convenience of engineers working in those localities.

Details in regard to the methods, accuracy, and cost of the work are purposely omitted, as it is desired to make this essentially a field book. Anyone interested in these data for similar work is referred to our Special Publications Nos. 18, 22, and 39, copies of which can be purchased from the Superintendent of Documents, Washington, D. C.

ACKNOWLEDGMENTS

The value of this publication is greatly enhanced through the generous cooperation of Lewis A. McArthur, vice president and general manager of the Pacific Power & Light Co., Portland, Oreg., who by correspondence with engineers and others throughout the State and by personal visits to various localities, settled doubtful points existing in the descriptions of the bench marks. He also arranged for the establishment of additional bench marks and connections with old bench marks that were in the vicinity of those established by the Coast and Geodetic Survey.

S. Murray, assistant chief engineer of the Union Pacific System, Portland, Oreg., and his associates cooperated materially by revising the descriptions of all bench marks along the Union Pacific System.

C. B. McCullough, bridge engineer of the Oregon State Highway Commission, Salem, Oreg., cooperated by revising the descriptions of a number of bench marks and by establishing additional bench marks in permanent highway bridges.

Individuals or organizations who have cooperated by making connections with bench marks not in the original work of the Coast and Geodetic Survey are credited at the end of the description of each bench mark so connected.

THE FIRST-ORDER LEVEL NET OF THE UNITED STATES

Over 50,000 miles of first-order leveling have been run in the United States. Of this amount the Coast and Geodetic Survey has done about 34,000 miles, the remainder having been done by the United States Geological Survey, the Corps of Engineers, United States Army, the Mississippi River Commission, the Missouri River Commission, the United States Lake Survey, the Pennsylvania Railroad, the Baltimore & Ohio Railroad, and the Buffalo, Rochester & Pittsburgh Railway. This vast network of leveling enters all the States of the Union but one and forms over 100 circuits. It is desired ultimately to have the net cover the country in such a way that no place will be more than 50 miles from a standard bench mark.

There have been four general adjustments of the first-order level net of the United States, each succeeding adjustment having become necessary by the addition of new lines to the net. The fourth and last adjustment was made in 1912, the net at that time being composed of about 29,000 miles of leveling.

The successive adjustments necessarily gave different values for the elevations of the bench marks, and the changes in certain sections of the country were of such sizes that the older values could not be held. The last adjustment shows that the net is sufficiently extended and the leveling of such strength and accuracy that the elevations can be considered as standard. So far as surveying and engineering purposes are concerned, they may be held for an indefinite period, or even for all time.

The lines run since the last adjustment have been fitted to the net without in any way disturbing the previously adopted elevations.

From time to time in the future, general adjustments of the level net will no doubt be made to obtain the theoretically best elevations of the junction points, but such adjustments will not disturb the standard elevations, unless they are found to be appreciably in error on account of blunders in the leveling or because of the disturbance of the marks.

THE FIRST-ORDER LEVEL NET IN OREGON

The Oregon portion of the first-order level net comprises the following level lines, totaling 1,980 miles in length and fixing the elevations of 978 permanent bench marks:

- I. Ontario to Biggs, Oreg.
- II. Owyhee, Idaho, to Hunt, Wash. (part).
- III. Kirk, Oreg., to Roseville, Calif. (part).
- IV. Klamath Falls to Ontario, Oreg.
- V. Gap Ranch to Bend, Oreg.
- VI. Weed, Calif., to Portland, Oreg. (part).
- VII. Portland to Astoria, Oreg.
- VIII. Portland, Oreg., to Wallula, Wash. (part).
- IX. Bend to Prineville, Oreg.

The only line of first-order leveling in Oregon that entered the 1912 adjustment of the first-order level net was line II across the

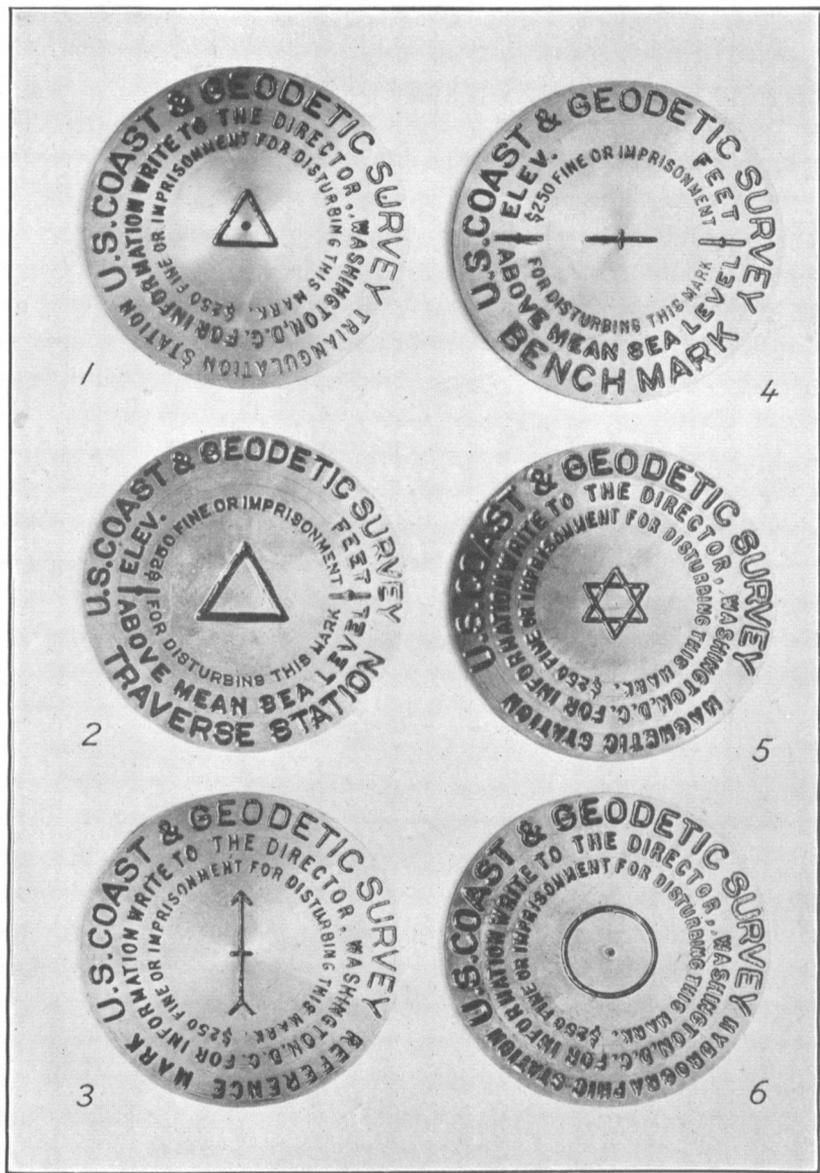


FIG. 1.—STANDARD MARKS OF THE U. S. COAST AND GEODETIC SURVEY

1. Triangulation station mark
2. Traverse station mark
3. Reference mark
4. Bench mark
5. Magnetic station mark
6. Hydrographic station mark

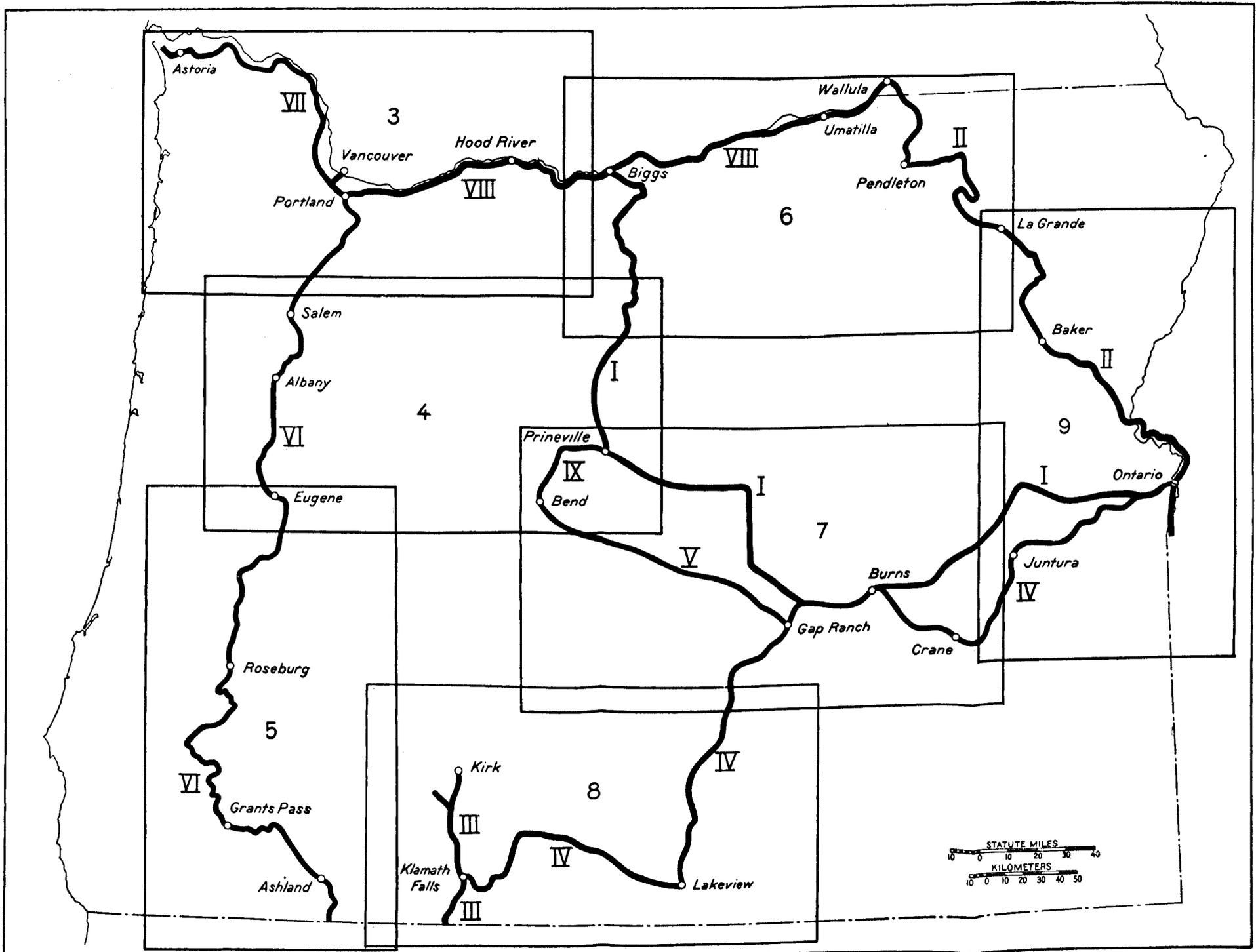


FIG. 2.—Index map of Oregon showing the location of the various first-order level lines and the boundaries of Figures 3 to 9 76039°—26. (Face p. 2.)

northeasten corner of the State. All the elevations along this line have been held at the standard values obtained from the 1912 adjustment as given in Special Publication No. 18. The new leveling has been fitted to the standard elevations at Wallula, Wash., Ontario, Oreg., Roseville, Calif., and mean sea level at Fort Stevens, Oreg.

BENCH MARKS

Various types of bench marks have been used to indicate the point of which the elevation was determined. On the earlier lines bolts and square cuts or outlined squares in masonry were used while a little later the stone post with a square cut in the top was introduced.

The present form of standard bench mark is the regulation brass disk shown in Figure 1. The disk, which is $3\frac{5}{8}$ inches in diameter, with a $2\frac{3}{8}$ -inch tenon upon the back, is set in the walls of substantial buildings, outcropping rocks, masonry structures of all kinds, and in the tops of stone or concrete posts especially constructed for the purpose. In future leveling of this bureau no bench mark is to be considered permanent unless marked by the regulation disk.

All permanent bench marks of this bureau are designated by a capital letter followed by a number. Where the brass disk has been used, the designation and the year in which the mark was established are stamped on it.

Bench marks, established by other organizations, with which connections were made, were in most cases given a United States Coast and Geodetic Survey designation followed by the initials of the organization which established the mark; for example, A 2 (U. S. G. S.). In no case, however, was the designation placed on the mark.

ORTHOMETRIC CORRECTION

The orthometric correction was applied to the results of all the leveling. This correction eliminates from the observed results the effect of the convergence of level surfaces as the poles of the earth are approached and the resulting elevations represent the vertical distances of the points above mean sea level. (See Special Publication No. 18, p. 49.)

MEAN SEA LEVEL

The elevations of all bench marks in the first-order level net of the United States are referred to mean sea level. (See Special Publication No. 41, Use of Mean Sea Level as the Datum for Elevations.)

Mean sea level is the average height of the surface of the sea, all stages of the water considered. It is the surface that the water of the ocean would form were it not disturbed by the attraction of the sun and moon and the force of the wind.

Mean sea level is usually determined from hourly height readings, and it may be established within a very small fraction of a foot by continuous tidal observations extending over at least a year. It is assumed that mean sea level is at the same elevation on the open coasts of the Atlantic Ocean, the Gulf of Mexico, and the Pacific Ocean.

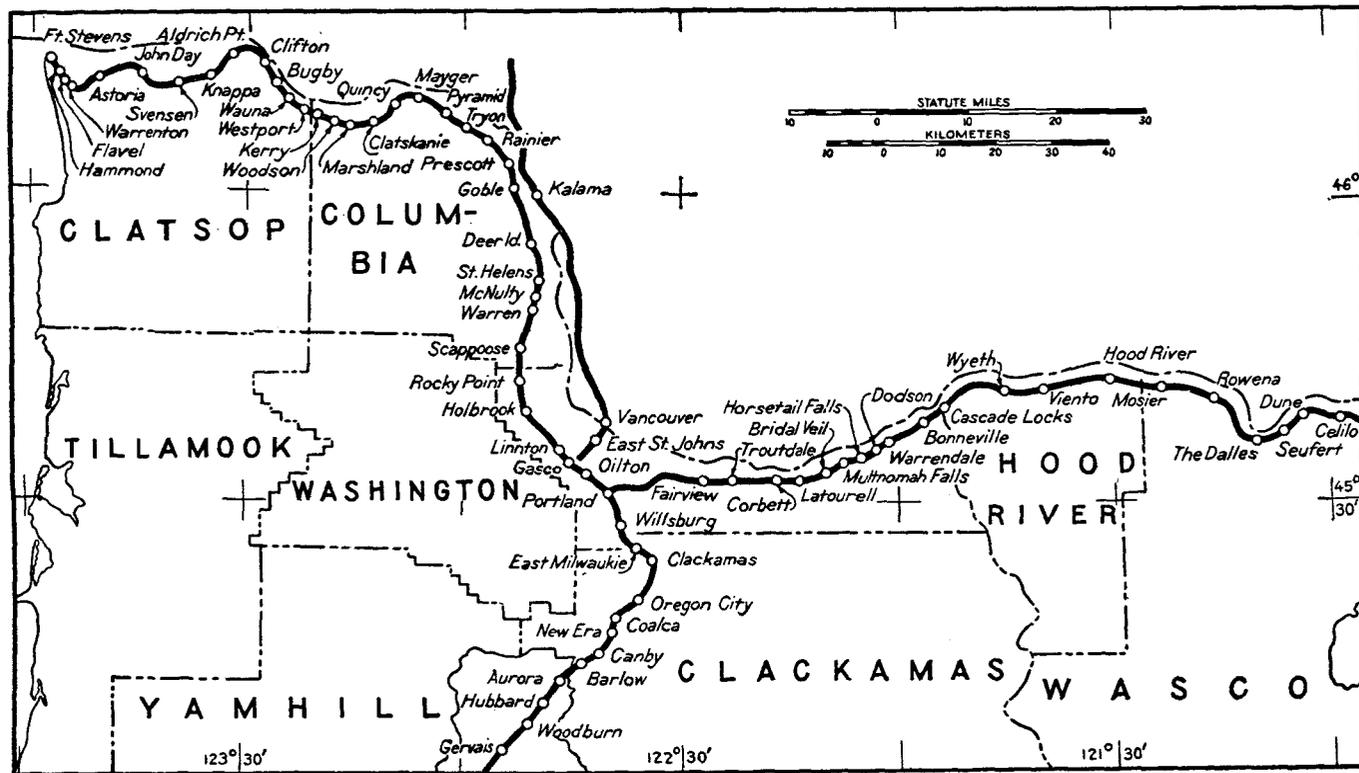


FIG. 3.—Line VII and parts of lines VI and VIII

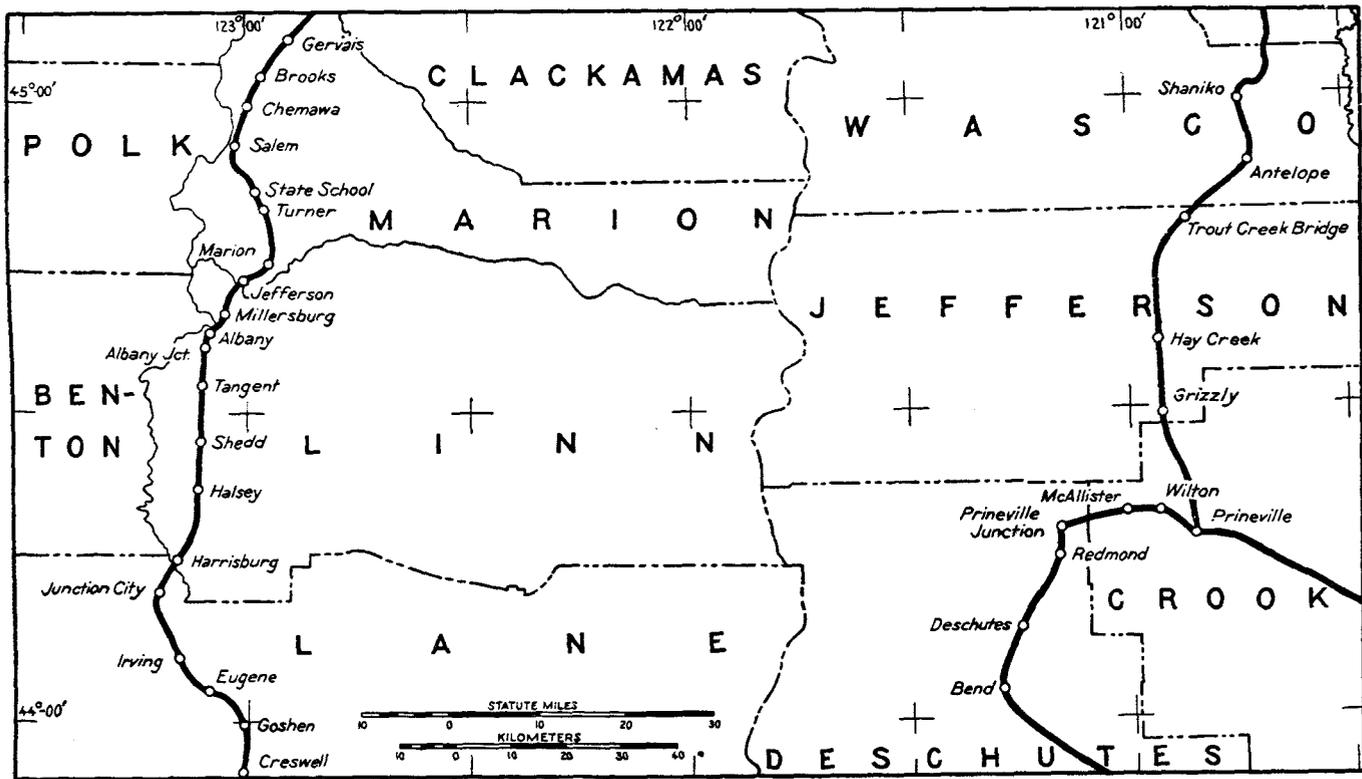


FIG. 4.—Line IX and parts of lines I, V, and VI

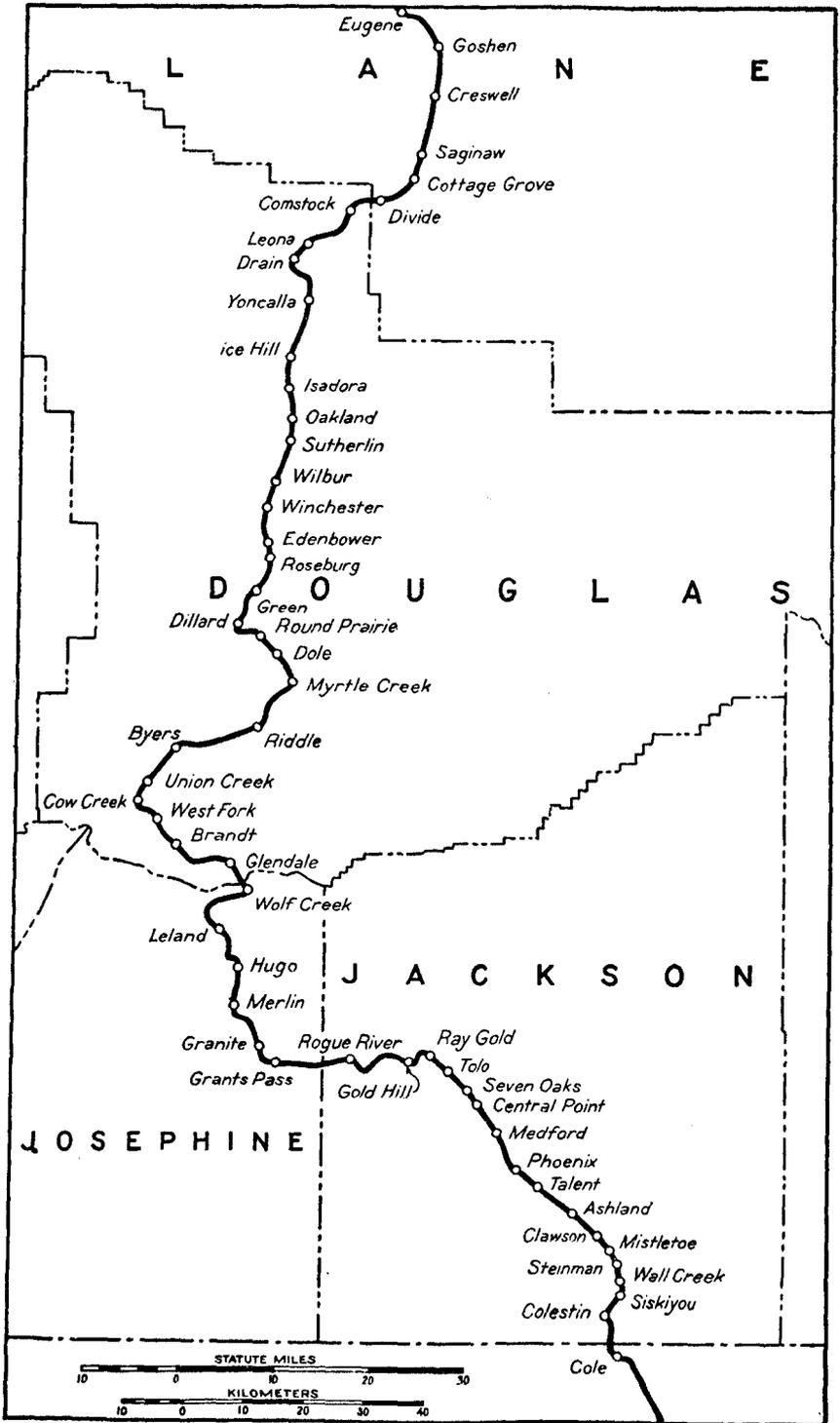


FIG. 5.—Part of line VI

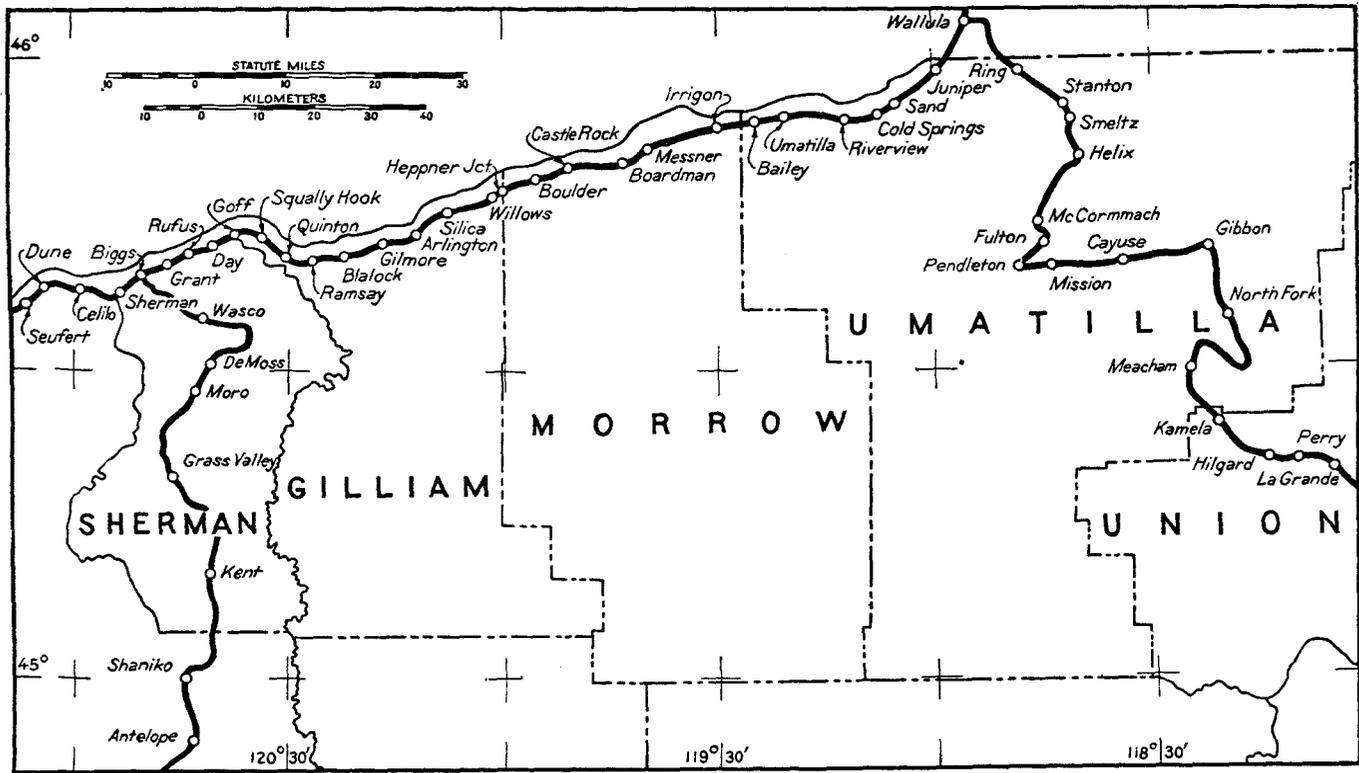


FIG. 6.—Parts of lines I, II, and VIII

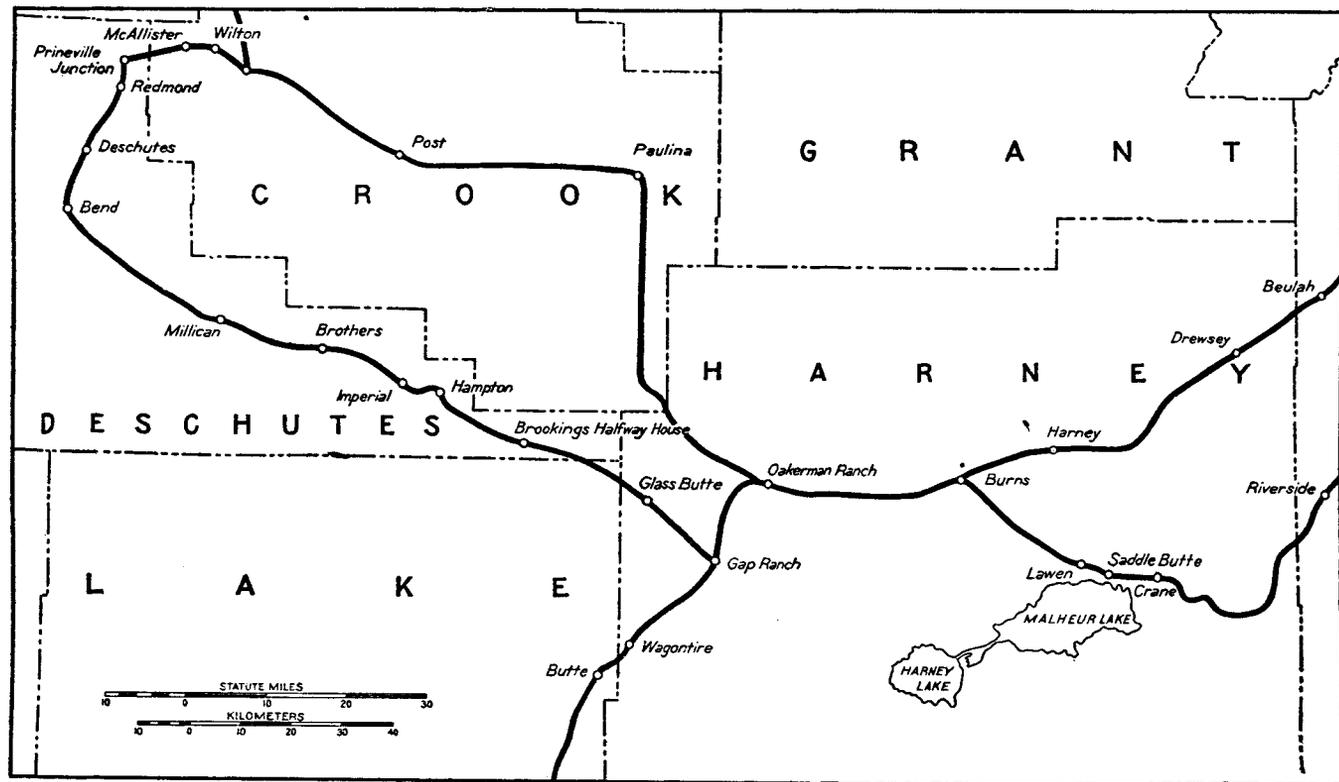


FIG. 7.—Lines V and IX and parts of lines I and IV

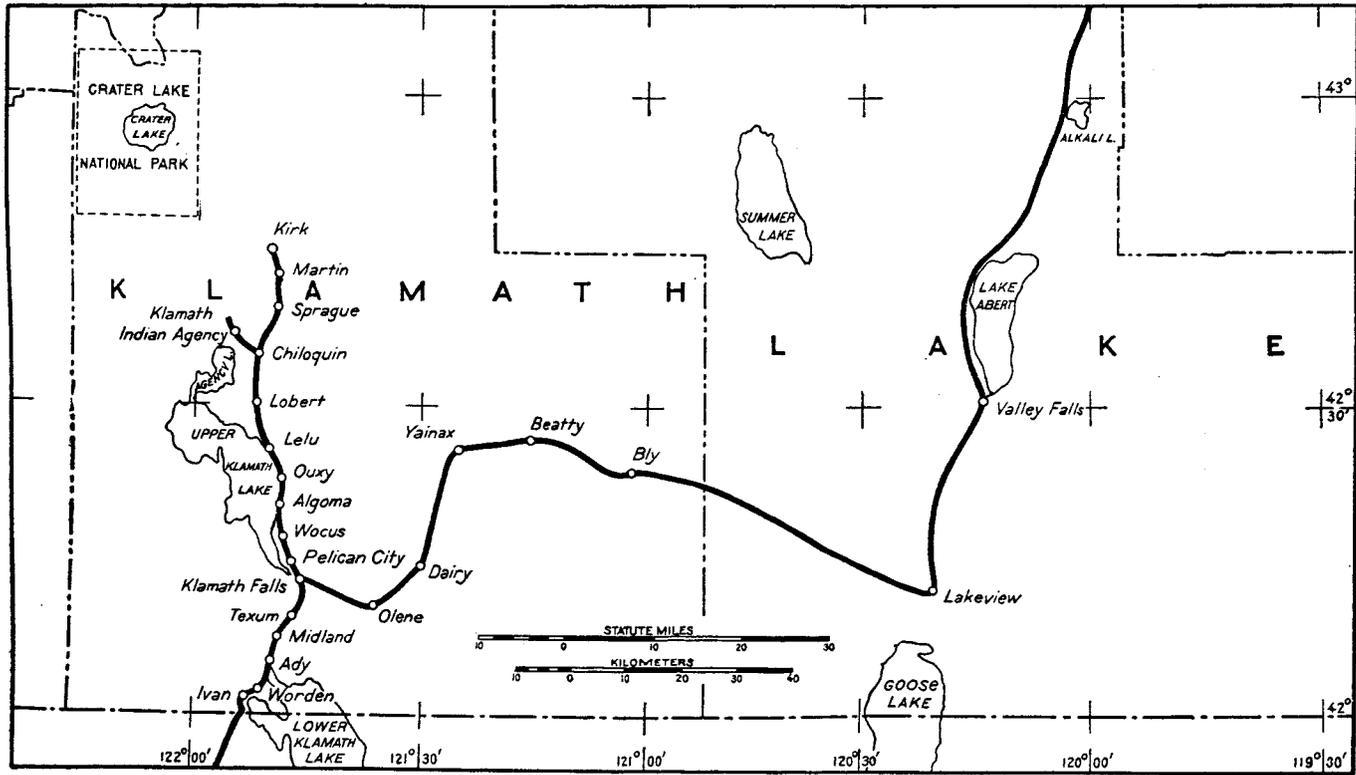


FIG. 8.—Parts of lines III and IV

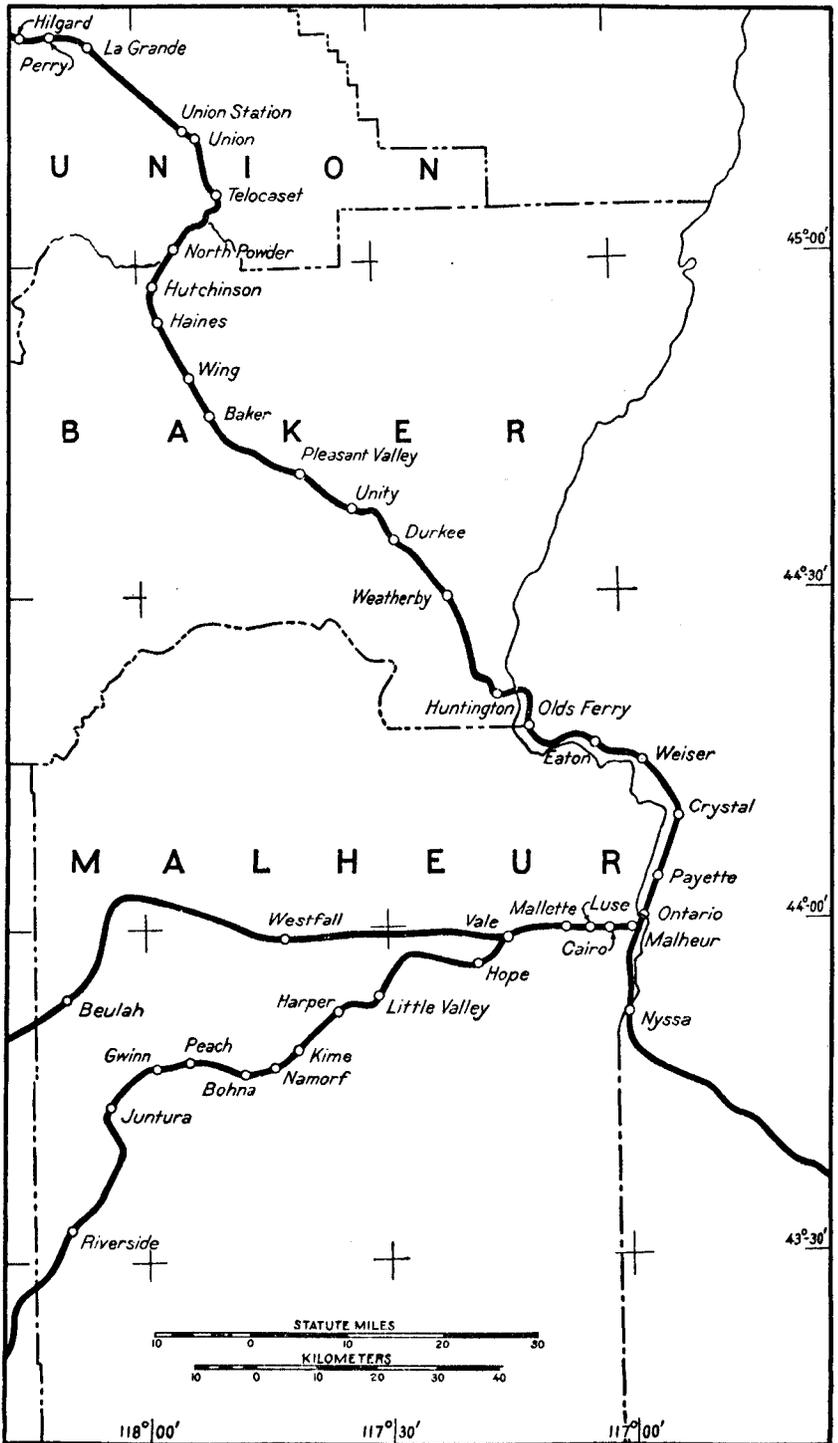


FIG. 9.—Parts of lines I, II, and IV

The standard elevations in Oregon are controlled principally by the 1912 standard elevations in the northeastern part of the State and the sea-level connection at Fort Stevens, Oreg.

The United States Engineers have maintained a self-registering tide gauge at Fort Stevens for a number of years. The records for 1905 and 1906 were loaned to this bureau, and our own tabulations and reductions were made from them.

Mean sea level at Fort Stevens based on the records for 1905 and 1906 and corrected to mean value by comparison with simultaneous observations at San Francisco, Calif., is as follows:

| | |
|------------------------------------------------|--------------|
| Elevation above zero of tide staff, 1913----- | Feet 4.34 |
| Elevation below bench mark A-3 (U. S. E.)----- | 19.23 |

ELEVATIONS

All the elevations are given in meters and feet above mean sea level. The elevations of the permanent bench marks are given to millimeters. This does not imply that the millimeters are known. For bench marks not more than 2 kilometers apart the difference in elevation is uncertain in the millimeters; for those which are from 2 to 200 kilometers apart the centimeters are also uncertain, and for greater distances there may be in some cases an uncertainty in the decimeters. Similarly, the uncertainty in the absolute elevations varies with the distance from the nearest tidal connection.

ARRANGEMENT OF DATA

The lines are arranged chronologically and numbered in the order that they were run. For each line there are given the permanent bench marks whose elevations were determined by the leveling along that line. If the line starts or ends on old bench marks, the data in regard to these bench marks are given with the data for the line which established their elevations.

The introduction at the head of each line contains the name of the officer in charge of the field work, the dates between which the work was done, and the route followed by the line.

The elevations of the top of the rail in front of the railroad stations are included in the lists following those containing the permanent bench marks, and the lines are numbered the same for these lists of supplementary elevations as for the lists of permanent bench marks.

EXPLANATION OF SKETCHES AND INDEX

Facing page 2 is an index sketch showing the general location of all the first-order level lines in Oregon. On the index sketch are indicated also the limits of the larger scale sketches which show in detail the route of the lines and the cities and towns at or near which the bench marks were placed.

Each bench mark is indexed by the names of the town and county which appear in the description.

RELATED PUBLICATIONS

A number of publications have been issued by the United States Coast and Geodetic Survey covering the results of first-order leveling in the United States. Appendix 8, Report for 1899, Appendix 3, Report for 1903, Precise Leveling in the United States, 1903-1907, and Special Publication No. 18 are reports on the four adjustments of the first-order level net and contain the elevations of bench marks derived from those respective adjustments and descriptions of the marks. The first three of these publications should be used for descriptions of bench marks only, as the elevations given in them have been superseded and the corrected elevations appear in Special Publication No. 18.

Special Publication No. 18 is a report on the fourth general adjustment of the first-order level net and contains the standard elevations of all bench marks in the first-order level net which had been established at the time the adjustment was made in 1912. Descriptions of bench marks in certain areas are also included, but one must have all four publications mentioned above for the complete list of the descriptions of the bench marks whose elevations are given in this publication. An index to the four publications is given in Special Publication No. 18.

The results of first-order leveling done since 1912, which have been published, appear as special publications and cover either a line of levels or the complete results for the leveling in some State. These publications are:

Special Publication No. 22, precise leveling from Brigham, Utah, to San Francisco, Calif.

Special Publication No. 39, precise leveling from Reno to Las Vegas, Nev., and from Tonopah Junction, Nev., to Laws, Calif.

Special Publication No. 77, precise leveling in Texas.

Special Publication No. 95, precise leveling in Georgia.

Special Publication No. 101, precise triangulation, traverse, and leveling in North Carolina.

All available publications of the United States Coast and Geodetic Survey may be obtained at a nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C.

DESCRIPTIONS AND ELEVATIONS OF PERMANENT BENCH MARKS

LINE I, ONTARIO TO BIGGS, OREG.

[Leveling by the United States Geological Survey]

This line of first-order levels was run by the United States Geological Survey and follows the highways from Ontario through Vale, Harney, Burns, Oakerman Ranch, Paulina, Prineville, Grizzly, Hay Creek, and Antelope to Shaniko, Oreg. From Shaniko the Oregon-Washington Railroad & Navigation Co.'s tracks were followed to Biggs, Oreg. The field work was done by C. H. Semper in 1903 and 1904, by the double-rodged simultaneous method.

2143 H (U. S. G. S.).—At Ontario, Malheur County, corner of Main Street and the street leading to railroad station, 12 feet east of northeast corner of

Brown's Hotel (Carter House). An iron post stamped "2143 H." (655.807 meters or 2,151.593 feet.)

2154 H (U. S. G. S.).—About 3.1 miles west of Ontario, Malheur County, south side of road, at corner of wire fence and road to ranch house. An iron post stamped "2154 H." (659.147 meters or 2,162.552 feet.)

2173 H (U. S. G. S.).—Six miles west of Ontario, Malheur County, south side of road, at crossing of irrigation ditch. An iron post stamped "2173 H." (664.837 meters or 2,181.219 feet.)

2195 H (U. S. G. S.).—About 9.1 miles west of Ontario, Malheur County, north side of road in front of Jerry Brosnahan's ranch house at fence line. An iron post stamped "2195 H." (671.696 meters or 2,203.724 feet.)

2214 H (U. S. G. S.).—About 12.3 miles west of Ontario, Malheur County, south side of highway, telephone pole at margin of unused ditch. An iron post stamped "2214 H." (677.402 meters or 2,222.442 feet.)

2235 H (U. S. G. S.).—At Vale, Malheur County, northeast corner of courthouse. An aluminum tablet stamped "2235 H." (683.643 meters or 2,242.919 feet.)

For additional bench marks at Vale, see page 41.

2395 H (U. S. G. S.).—Three miles west of Vale, Malheur County, 50 feet south of roadway. An iron post stamped "2395 H." (732.559 meters or 2,403.405 feet.)

2308 H (U. S. G. S.).—Seven miles west of Vale, Malheur County, directly opposite schoolhouse on north side of road and on line with east face of building. An iron post stamped "2308 H." (706.095 meters or 2,316.580 feet.)

D 21 (U. S. G. S.).—About 10.6 miles west of Vale, Malheur County, Louis Paddock's ranch, south margin of road, 50 feet east of side of house. An iron post stamped "2334 H." (714.092 meters or 2,342.817 feet.)

2359 H (U. S. G. S.).—About 13.7 miles west of Vale, Malheur County, in Malheur Canyon, at crossing of road and railroad bed, on south side of railroad bed. An iron post stamped "2359 H." (721.586 meters or 2,367.403 feet.)

A 21 (U. S. G. S.).—Sixteen miles west of Vale, Malheur County, 10 feet north of railroad bed at Oregon Short Line Railroad, borrow pit. An iron post stamped "2384 H." (729.360 meters or 2,392.938 feet.)

2434 H (U. S. G. S.).—About 20.3 miles west of Vale, Malheur County, lower end of Little Valley, 20 feet north of road. An iron post stamped "2434 H." (744.545 meters or 2,442.727 feet.)

2460 H (U. S. G. S.).—About 22.3 miles west of Vale, Malheur County, foot of road up big hill leading to lower Harper ranch, south side of railroad. An iron post stamped "2460 H." (752.246 meters or 2,467.994 feet.)

2504 H (U. S. G. S.).—One mile west of lower Harper ranch, Malheur County, gate leading to main road to Westfall, 10 feet east of gate on fence line. An iron post stamped "2504 H." (765.857 meters or 2,512.649 feet.)

2585 H (U. S. G. S.).—About 3.1 miles west of lower Harper ranch, Malheur County, 15 feet north of road, 250 feet east of point of hill. An iron post stamped "2585 H." (790.578 meters or 2,593.755 feet.)

2712 H (U. S. G. S.).—Six miles west of lower Harper ranch, Malheur County, 20 feet south of road. An iron post stamped "2712 H." (829.268 meters or 2,720.690 feet.)

2965 H (U. S. G. S.).—About 10.1 miles west of lower Harper ranch, Malheur County, 15 feet east of road. An iron post stamped "2965 H." (906.216 meters or 2,973.145 feet.)

2994 H (U. S. G. S.).—At Westfall, Malheur County, between Jones's store and stone warehouse, at side of store. An iron post stamped "2994 H." (915.085 meters or 3,002.242 feet.)

3108 H (U. S. G. S.).—About 3.1 miles west of Westfall, Malheur County, 10 feet north of road, 20 feet east of small creek bottom. An iron post stamped "3108 H." (949.853 meters or 3,116.309 feet.)

3239 H (U. S. G. S.).—About 6.2 miles west of Westfall, Malheur County, 15 feet south of road. An iron post stamped "3239 H." (989.808 meters or 3,247.394 feet.)

3426 H (U. S. G. S.).—About 9.4 miles west of Westfall, Malheur County, 10 feet south of road. An iron post stamped "3426 H." (1,046.710 meters or 3,434.080 feet.)

- 3786 H (U. S. G. S.)**.—Twelve miles west of **Westfall**, Malheur County, 20 feet south of road, halfway up hill. An iron post stamped "3786 H." (1,156.661 meters or 3,794.812 feet.)
- 4052 H (U. S. G. S.)**.—About 1.6 miles west of **Stage** station, Malheur County, 10 feet north of road. An iron post stamped "4052 H." (1,237.590 meters or 4,060.325 feet.)
- 4535 H (U. S. G. S.)**.—About 4.6 miles west of **Stage** station, Malheur County, on south margin of road at big bend, near foot of hill. An iron post stamped "4535 H." (1,384.757 meters or 4,543.158 feet.)
- 4454 H (U. S. G. S.)**.—About 7.7 miles west of **Stage** station, Malheur County, 15 feet north of road. An iron post stamped "4454 H." (1,360.106 meters or 4,462.282 feet.)
- 4103 H (U. S. G. S.)**.—About 1.5 miles west of **Wilson's** ranch, Malheur County, fence line at northwest angle of road to J. S. Hunter's house. An iron post stamped "4103 H." (1,253.013 meters or 4,110.928 feet.)
- 3957 H (U. S. G. S.)**.—About 3.4 miles west of **Wilson's** ranch, Malheur County, 10 feet north of road. An iron post stamped "3957 H." (1,208.628 meters or 3,965.308 feet.)
- 3471 H (U. S. G. S.)**.—Six miles west of **Wilson's** ranch, Malheur County, in Agency Valley, in front of T. L. Arnold's house, 15 feet south of gate. An iron post stamped "3471 H." (1,060.438 meters or 3,479.121 feet.)
- 3269 H (U. S. G. S.)**.—At **Beulah**, Malheur County, 25 feet east of the east end of iron bridge over North Fork Malheur River, on north margin of road. An iron post stamped "3269 H." (998.790 meters or 3,276.865 feet.)
- 3838 H (U. S. G. S.)**.—About 2.8 miles west of **Beulah**, Malheur County, in valley at top of Agency Mountain, on south margin of road. An iron post stamped "3838 H." (1,172.439 meters or 3,846.576 feet.)
- 3779 H (U. S. G. S.)**.—Six miles west of **Beulah**, Malheur County, 15 feet south of road, on south side of creek bottom. An iron post stamped "3779 H." (1,154.302 meters or 3,787.074 feet.)
- 3612 H (U. S. G. S.)**.—About 8.6 miles west of **Beulah**, Malheur County, on north margin of road, 25 feet west of gate to **Altnow's** ranch house, at fence line. An iron post stamped "3612 H." (1,103.347 meters or 3,619.898 feet.)
- 3523 H (U. S. G. S.)**.—About 12.1 miles west of **Beulah**, Malheur County, 90 feet east of bridge over Warm Spring Creek, 30 feet north of wire fence. An iron post stamped "3523 H." (1,076.322 meters or 3,531.233 feet.)
- 3508 H (U. S. G. S.)**.—At **Drewsey**, Harney County, southwest corner of A. J. Johnson and Bros. store. An iron post stamped "3508 H." (1,071.866 meters or 3,516.613 feet.)
- 3538 H (U. S. G. S.)**.—About 2.6 miles west of **Drewsey**, Harney County, 20 feet west of bridge over Stinkingwater Creek, south side of stream. An iron post stamped "3538 H." (1,080.790 meters or 3,545.891 feet.)
- 3596 H (U. S. G. S.)**.—About 5.4 miles west of **Drewsey**, Harney County, on new road over Stinkingwater Mountain, 15 feet north of road. An iron post stamped "3596 H." (1,098.701 meters or 3,604.656 feet.)
- 4099 H (U. S. G. S.)**.—About 8.3 miles west of **Drewsey**, Harney County, on Stinkingwater Mountain grade, 30 feet south of road. An iron post stamped "4099 H." (1,251.839 meters or 4,107.075 feet.)
- 4718 H (U. S. G. S.)**.—About 12.3 miles west of **Drewsey**, Harney County, top of Stinkingwater Mountain, 20 feet south of road. An iron post stamped "4718 H." (1,440.574 meters or 4,726.284 feet.)
- 4652 H (U. S. G. S.)**.—About 14.5 miles west of **Drewsey**, Harney County, at upper end of Nigger Flat, 10 feet south of road. An iron post stamped "4652 H." (1,420.346 meters or 4,659.919 feet.)
- 4483 H (U. S. G. S.)**.—About 17.5 miles west of **Drewsey**, Harney County, in canyon 15 feet north of road, 1.1 miles east of old stage station. An iron post stamped "4483 H." (1,368.965 meters or 4,491.347 feet.)
- 4174 H (U. S. G. S.)**.—About 20.4 miles west of **Drewsey**, Harney County, 1 mile west of east end of Harney Valley, at west end of turnout in road. An iron post stamped "4174 H." (1,274.695 meters or 4,182.062 feet.)
- 4132 H (U. S. G. S.)**.—About 23.3 miles west of **Drewsey**, Harney County, in Harney Valley, 70 feet north of road. An iron post stamped "4132 H." (1,261.902 meters or 4,140.091 feet.)
- 4133 H (U. S. G. S.)**.—About 26.4 miles west of **Drewsey**, Harney County, in Harney Valley, 0.3 mile west of old schoolhouse, south side of road. An iron post stamped "4133 H." (1,262.291 meters or 4,141.365 feet.)

4147 H (U. S. G. S.).—About 1.7 miles east of **Harney**, Harney County, at junction of main road and road to Steens Mountain, south side of road, 6 feet east of signpost. An iron post stamped "4147 H." (1,266.428 meters or 4,154.939 feet.)

4161 H (U. S. G. S.).—At **Harney**, Harney County, at northeast corner of town hall, 7 feet from fence. An iron post stamped "4161 H." (1,270.935 meters or 4,169.726 feet.)

4138 H (U. S. G. S.).—About 2.9 miles west of **Harney**, Harney County, directly opposite William Krzeska's house, on side of road at fence line. An iron post stamped "4138 H." (1,263.744 meters or 4,146.134 feet.)

4131 H (U. S. G. S.).—About 6.2 miles west of **Harney**, Harney County, 65 feet west of bridge on north margin of road. An iron post stamped "4131 H." (1,261.642 meters or 4,139.236 feet.)

4146 H (U. S. G. S.).—About 9.7 miles west of **Harney**, Harney County, at northeast corner of Poison Creek schoolhouse fence, on margin of road. An iron post stamped "4146 H." (1,266.364 meters or 4,154.729.)

D 19 (U. S. G. S.).—At **Burns**, Harney County, front yard of county courthouse, 10 feet from fence and 4 feet north of walk leading to building. An iron post stamped "4177 H." (1,275.810 meters or 4,185.720 feet.)

For additional bench marks at Burns, see page 38.

4147 H (U. S. G. S.).—About 3.1 miles west of **Burns**, Harney County, 25 feet east of road. An iron post stamped "4147 H." (1,266.570 meters or 4,155.406 feet.)

B 19 (U. S. G. S.).—About 6.2 miles west of **Burns**, Harney County, on the Bend Burns road at the point where it leaves the valley and goes over the hill, in a fence corner. An iron post stamped "4160 H." (1,270.439 meters or 4,168.099 feet.)

A 19 (U. S. G. S.).—About 8.9 miles west of **Burns**, Harney County, 50 feet west of Jenkins ranch house, on north side of the Bend Burns road at fence line. An iron post stamped "4138 H." (1,263.818 meters or 4,146.376 feet.)

U 18 (U. S. G. S.).—About 12.9 miles west of **Burns**, Harney County, on the south margin of the Bend Burns road at fence line, 4 feet west of gate leading to Calkins ranch house. An iron post stamped "4195 H." (1,281.096 meters or 4,203.062 feet.)

T 18 (U. S. G. S.).—About 16 miles west of **Burns**, Harney County, 15 feet south of the old and 20 feet north of the new Bend Burns road, in a canyon. An iron post stamped "4404 H." (1,344.843 meters or 4,412.206 feet.)

4552 H (U. S. G. S.).—About 19.2 miles west of **Burns**, Harney County, 30 feet north of the road. An iron post stamped "4552 H." (1,390.065 meters or 4,560.570 feet.)

4153 H (U. S. G. S.).—About 21.9 miles west of **Burns**, Harney County, 600 feet west of summit of small hill, 40 feet south of road. An iron post stamped "4153 H." (1,268.289 meters or 4,161.044 feet.)

4318 H (U. S. G. S.).—About 2.9 miles east of **Oakerman ranch**, Harney County, 15 feet south of road. An iron post stamped "4318 H." (1,318.648 meters or 4,326.265 feet.)

S 18 (U. S. G. S.).—At **Oakerman ranch**, Harney County, opposite the old Riley post office at the fence in front of Fred Oakerman's house. An iron post stamped "4210 H." (1,285.730 meters or 4,218.266 feet.)

For additional bench marks near Oakerman Ranch, see page 37.

4264 H (U. S. G. S.).—About 4.1 miles west of **Oakerman ranch**, Harney County at corner of road leading to schoolhouse, near wire-fence line. An iron post stamped "4264 H." (1,302.209 meters or 4,272.332 feet.)

4295 H (U. S. G. S.).—About 7.3 miles west of **Oakerman ranch**, Harney County, W. B. Johnson's upper ranch house at southwest corner of yard fence. An iron post stamped "4295 H." (1,311.593 meters or 4,303.118 feet.)

4345 H (U. S. G. S.).—Eleven miles west of **Oakerman ranch**, Harney County, north margin of road, on line with south face of Cecil ranch house. An iron post stamped "4345 H." (1,326.960 meters or 4,353.536 feet.)

4761 H (U. S. G. S.).—About 2.8 miles west of **Cecil's**, Harney County, 0.3 mile east of Dry Lake, 20 feet south of road. An iron post stamped "4761 H." (1,453.780 meters or 4,769.610 feet.)

4722 H (U. S. G. S.).—About 5.8 miles west of Cecil's, Harney County, 21 feet south of road, 100 feet north of small hill with bowlders along top. An iron post stamped "4722 H." (1,441.748 meters or 4,730.134 feet.)

5058 H (U. S. G. S.).—Nine miles west of Cecil's, Harney County, south side of stage road at forks of road leading to spring. An iron post stamped "5058 H." (1,544.167 meters or 5,066.155 feet.)

5408 H (U. S. G. S.).—About 12.4 miles west of Cecil's, Harney County, near the center of the northwest quarter of section 27, township 21 south, range 24 east, Williamette meridian, west side of pine woods, at edge of clearing, 20 feet south of road. An iron post stamped "5408 H." (1,651.027 meters or 5,416.743 feet.)

5061 H (U. S. G. S.).—About 14.9 miles west of Cecil's, Harney County, in canyon 0.5 mile east of junction of road to Paulina. An iron post stamped "5061 H." (1,545.260 meters or 5,069.742 feet.)

4776 H (U. S. G. S.).—At Street's, Crook County, gate leading into yard of James Street's ranch, at line of fence. An iron post stamped "4776 H." (1,458.371 meters or 4,784.672 feet.)

4791 H (U. S. G. S.).—About 3.8 miles north of Street's, Crook County, south side of small hill, 12 feet east of road. An iron post stamped "4791 H." (1,462.829 meters or 4,799.298 feet.)

4602 H (U. S. G. S.).—About 6.7 miles north of Street's, Crook County, north end of pasture fence, 1,000 feet north of deserted house, 45 feet east of road. An iron post stamped "4602 H." (1,405.261 meters or 4,610.428 feet.)

4478 H (U. S. G. S.).—Eleven miles north of Street's, Crook County, west side of road at mail-box post. An iron post stamped "H 4478 H 1903." (1,367.390 meters or 4,486.179 feet.)

4507 H (U. S. G. S.).—About 13.1 miles north of Street's, Crook County, northwest corner of Hardin's yard. An iron post stamped "4507 H." (1,376.204 meters or 4,515.095 feet.)

4757 H (U. S. G. S.).—About 2.6 miles north of Hardin's, Crook County, at summit of hill, 30 feet west of road. An iron post stamped "4757 H." (1,452.545 meters or 4,765.558 feet.)

4290 H (U. S. G. S.).—Five miles north of Hardin's, Crook County, 25 feet north of creek crossing, at fence line east of road. An iron post stamped "4290 H." (1,310.003 meters or 4,297.901 feet.)

3963 H (U. S. G. S.).—At Smith's, Crook County, in front of F. M. Smith's ranch house, 15 feet south of gate, on line of fence. An iron post stamped "3963 H." (1,210.493 meters or 3,971.427 feet.)

3925 H (U. S. G. S.).—About 3.4 miles north of Smith's, Crook County, at top of hill, 400 feet north of forks of road. An iron post stamped "3925 H." (1,198.859 meters or 3,933.255 feet.)

3767 H (U. S. G. S.).—About 6.8 miles north of Smith's, Crook County, 25 feet east of road, 600 feet north of top of small hill. An iron post stamped "3767 H." (1,150.753 meters or 3,775.429 feet.)

3676 H (U. S. G. S.).—At Paulina, Crook County, southwest corner of Paulina Hall, 1 foot from building. An iron post stamped "3676 H." (1,123.091 meters or 3,684.674 feet.)

3660 H (U. S. G. S.).—About 2.6 miles west of Paulina, Crook County, on line with east side of J. D. Dunkle's house, 20 feet from road. An iron post stamped "3660 H." (1,118.077 meters or 3,668.223 feet.)

3625 H (U. S. G. S.).—About 5.8 miles west of Paulina, Crook County, near gate leading to Gilchrist ranch house, 150 feet east of bridge over Crooked River, on north fence line. An iron post stamped "3625 H." (1,107.420 meters or 3,633.290 feet.)

3583 H (U. S. G. S.).—About 8.8 miles west of Paulina, Crook County, at Meyer's ranch near gate leading to corral at stage station, on line of fence, near the south line of the northeast quarter of section 16, township 17 south, range 22 east. An iron post stamped "3583 H." (1,094.670 meters or 3,591.430 feet.)

3558 H (U. S. G. S.).—About 12.5 miles west of Paulina, Crook County, at the O. B. Gray ranch, 100 feet west of house, at corner of fence, in northwest quarter of section 12, township 17 south, range 21 east. An iron post stamped "3558 H." (1,087.000 meters or 3,566.265 feet.)

3536 H (U. S. G. S.).—About 14.6 miles west of Paulina, Crook County, small bridge over creek, in front of Miller's ranch, south fence line. An iron post stamped "3536 H." (1,080.433 meters or 3,544.721 feet.)

3473 H (U. S. G. S.).—Two miles west of **Stewart's**, Crook County, in front of ranch house of W. W. Harris, at fence. An iron post stamped "3473 H." (1,061.062 meters or 3,481.169 feet.)

3526 H (U. S. G. S.).—About 3.9 miles west of **Stewart's**, Crook County, 20 feet north of road, opposite juniper tree with two mail boxes of W. R. Kelley. An iron post stamped "3526 H." (1,077.350 meters or 3,534.607 feet.)

3409 H (U. S. G. S.).—About 7.4 miles west of **Stewart's**, Crook County, north fence line between deserted log house and barn. An iron post stamped "3409 H." (1,041.766 meters or 3,417.863 feet.)

3388 H (U. S. G. S.).—About 10.2 miles west of **Stewart's**, Crook County, forks of road to left, 0.25 mile east of post office, north side of road, 10 feet from fence. An iron post stamped "3388 H." (1,035.280 meters or 3,396.581 feet.)

3339 H (U. S. G. S.).—About 3.4 miles west of **Post**, Crook County, at corner of wire fence, in front of G. F. Wellborn's house. An iron post stamped "3339 H." (1,020.386 meters or 3,347.718 feet.)

3289 H (U. S. G. S.).—About 6.9 miles west of **Post**, Crook County, in front of Williamson and Gesnor ranch house, at northwest corner of yard fence. An iron post stamped "3289 H." (1,004.997 meters or 3,297.227 feet.)

3261 H (U. S. G. S.).—About 10.9 miles west of **Post**, Crook County, in front of Davis ranch house, at northwest corner of yard fence. An iron post stamped "3261 H." (996.709 meters or 3,270.035 feet.)

3708 H (U. S. G. S.).—About 14.3 miles west of **Post**, Crook County, at Ralph Porfly's upper ranch, north corner of lane leading to house, on line with road fence. An iron post stamped "3708 H." (1,132.737 meters or 3,716.322 feet.)

4027 H (U. S. G. S.).—About 16.8 miles west of **Post**, Crook County, east corner of fence at road leading to house of R. W. Breeser. An iron post stamped "4027 H." (1,230.143 meters or 4,035.894 feet.)

4023 H (U. S. G. S.).—About 3.5 miles west of **Breeser ranch**, Crook County, 15 feet east of the east face of S. W. Yengey's house. An iron post stamped "4023 H." (1,228.991 meters or 4,032.115 feet.)

3215 H (U. S. G. S.).—About 7.5 miles west of **Breeser ranch**, Crook County, in front of Fewerhelm Radloff's house, at line of picket fence. An iron post stamped "3215 H." (982.629 meters or 3,223.842 feet.)

2867 H (U. S. G. S.).—At **Prineville**, Crook County, at main entrance to Crook County courthouse, 2 feet from the walk. An iron post stamped "2867 H." (874.383 meters or 2,868.705 feet.)

For additional bench marks at **Prineville**, see page 72.

2849 H (U. S. G. S.).—About 3.1 miles northwest of **Prineville**, Crook County, on the City of **Prineville** Railway, at the northeast corner of W. T. Davenport's yard, near the fence and at the edge of the road. An iron post stamped "2849 H." (870.904 meters or 2,857.291 feet.)

2962 H (U. S. G. S.).—About 6.7 miles north of **Prineville**, Crook County, 250 feet northeast of Fred Stewart's ranch house, east margin of road, at telephone pole. An iron post stamped "2962 H." (905.619 meters or 2,971.185 feet.)

3127 H (U. S. G. S.).—About 8.6 miles north of **Prineville**, Crook County, C. W. Circle's ranch, 150 feet north of house, at gate to barn. An iron post stamped "3127 H." (955.859 meters or 3,136.013 feet.)

3975 H (U. S. G. S.).—About 12.2 miles north of **Prineville**, Crook County, near the top of mountain, 20 feet north of L. M. Delano's house, on line with front fence. An iron post stamped "3975 H." (1,214.157 meters or 3,983.447 feet.)

3692 H (U. S. G. S.).—At **Grizzly**, Jefferson County, at southwest corner of Wills Bros.' Store. An iron post stamped "3692 H." (1,128,014 meters or 3,700.826 feet.)

3643 H (U. S. G. S.).—About 4.7 miles north of **Grizzly**, Jefferson County, in front of W. M. Joslin's house, southwest corner yard. An iron post stamped "3643 H." (1,113.079 meters or 3,651.826 feet.)

3152 H (U. S. G. S.).—About 7.4 miles north of **Grizzly**, Jefferson County, forks of road, near signboard "Prineville 24 miles, Hay Creek 3 miles." An iron post stamped "3152 H." (963.632 meters or 3,161.517 feet.)

2938 H (U. S. G. S.).—At **Hay Creek**, Jefferson County, southwest corner of yard of ranch house, at line of road. An iron post stamped "2938 H." (898.209 meters or 2,946.874 feet.)

2757 H (U. S. G. S.).—About 2.1 miles north of **Hay Creek**, Jefferson County, in front of R. Parish's ranch, 15 feet south of gate at fence line. An iron post stamped "2757 H." (842.933 meters or 2,765.524 feet.)

1965 H (U. S. G. S.).—About 7.2 miles north of **Hay Creek**, Jefferson County, lane leading to McPherson ranch house, 60 feet west of highway. An iron post stamped "1965 H." (601.494 meters or 1,973.400 feet.)

1869 H (U. S. G. S.).—At **Heisler** station, Jefferson County, east side of yard, 20 feet south of northeast corner. An iron post stamped "1869 H." (572.333 meters or 1,877.730 feet.)

1686 H (U. S. G. S.).—About 2.1 miles north of **Hay Creek Bridge**, Jefferson County, in hayfield, just north of The Dalles-California Highway, and 200 feet north of Friday ranch house. An iron post stamped "1686 H." (516.501 meters or 1,694.554 feet.)

B. M. Square 1.—About 2.1 miles north of **Hay Creek Bridge**, Jefferson County, on the south end of a concrete culvert under The Dalles-California Highway about 200 feet east of Friday ranch house. A chiseled square. (517.284 meters or 1,697.124 feet.) The connection with this bench mark was made by the Oregon Geographic Board.

1848 H. (U. S. G. S.).—In Wasco County, about 1.4 miles northeasterly from Trout Creek Bridge, Jefferson County, in a hayfield just east of the junction of the Dalles-California Highway and the stage road to Antelope. An iron post stamped "1848 H." (565.952 meters or 1,856.795 feet.)

B. M. Square 2.—About 1.4 miles northeasterly from Trout Creek Bridge, in Wasco County, on the east end of a concrete culvert under The Dalles-California Highway at a point about 300 feet north of the junction of this highway and the old stage road to Antelope. A chiseled square. This bench mark is just north of the Jefferson-Wasco County line, and is about 10 feet below the highway grade and about 50 feet west of the Antelope road. (571.535 meters or 1,875.111 feet.) The connection with this bench mark was made by the Oregon Geographic Board.

2127 H (U. S. G. S.).—In Wasco County, about 6.1 miles northeasterly from Trout Creek Bridge, Jefferson County, on Shaniko stage road, at east end of row of poplar trees at ruins of old Durbin ranch, 100 feet south of road. An iron post stamped "2127 H." (650.802 meters or 2,135.174 feet.)

2484 H (U. S. G. S.).—About 2.6 miles southerly from **Antelope**, Wasco County, in front of Taylor ranch, formerly owned by Polk Mays, 10 feet north of gate and 300 feet easterly from road. An iron post stamped "2484 H." (759.691 meters or 2,492.418 feet.)

2622 H. (U. S. G. S.).—At **Antelope**, Wasco County, on Main Street, southeast corner of cart house No. 1, 3 feet from walk. An iron post stamped "2622 H." (801.912 meters or 2,630.940 feet.)

3083 H (U. S. G. S.).—About 1.9 miles north of **Antelope**, Wasco County, 100 feet east of county road, near grove of trees on abandoned road location. An iron post stamped "3083 H." (942.382 meters or 3,091.799 feet.)

3334 H (U. S. G. S.).—At **Shaniko**, Wasco County, on the north side of Fifth Street about 100 feet east of the Sherman Highway on E Street, at the sidewalk line. An iron post stamped "3334 H." (1,018.699 meters or 3,342.181 feet.)

B. M. Square 3.—At **Shaniko**, Wasco County, on the north end of the lower east concrete step of the Columbia Southern Hotel at the northwest corner of Fourth and E Streets. A chiseled square lettered "B. M." (1,018.211 meters or 3,340.582 feet.) The connection with this bench mark was made by the Oregon Geographic Board.

B. M. Square 4.—At **Shaniko**, Wasco County, on the east side of the Sherman Highway on E Street, on top of a concrete pier supporting the southeast corner of a bell tower, a chiseled square lettered "B. M." (1,018.403 meters or 3,341.209 feet.) The connection with this bench mark was made by the Oregon Geographic Board.

3112 H (U. S. G. S.).—About 4.1 miles north of **Shaniko**, Wasco County, on the Oregon-Washington Railroad & Navigation Co. track, 540 feet south of road crossing, 37 feet west of track. An iron post stamped "3112 H." (951.183 meters or 3,120.672 feet.)

3018 H (U. S. G. S.).—About 6.6 miles north of **Shaniko**, Wasco County, on the Oregon-Washington Railroad & Navigation Co. track, at road crossing, 30 feet west of rail, 30 feet north of highway. An iron post stamped "3018 H." (922.527 meters or 3,026.658 feet.)

2810 H (U. S. G. S.).—About 9.8 miles north of **Shaniko**, Wasco County, on the Oregon-Washington Railroad & Navigation Co. track, 50 feet south of

south end of trestle 59.69, 22 feet east of track. An iron post stamped "2810 H." (859.164 meters or 2,818.774 feet.)

2623 H (U. S. G. S.).—At **Wilcox**, Sherman County, on the Oregon-Washington Railroad & Navigation Co. track, 200 feet south of warehouse, 17 feet east of track, 14 feet north of telephone pole. An iron post stamped "2623 H." (802.069 meters or 2,631.456 feet.)

2701 H (U. S. G. S.).—At **Kent**, Sherman County, 20 feet east of the Oregon-Washington Railroad & Navigation Co. track, 3 feet north of warehouse and about 300 feet south of the point where the main road crosses the railroad. An iron post stamped "2701 H." (825.812 meters or 2,709.351 feet.)

2699 H (U. S. G. S.).—About 2.5 miles north of **Kent**, Sherman County, on the Oregon-Washington Railroad & Navigation Co. track, at private-road crossing, 25 feet east of track, 40 feet south of crossing. An iron post stamped "2699 H." (825.316 meters or 2,707.723 feet.)

2467 H (U. S. G. S.).—About 6.6 miles north of **Kent**, Sherman County, on the Oregon-Washington Railroad & Navigation Co. track. An iron post stamped "2467 H." (754.572 meters or 2,475.625 feet.)

2457 H (U. S. G. S.).—About 9.7 miles north of **Kent**, Sherman County, on the Oregon-Washington Railroad & Navigation Co. track, on the north side of a road crossing, 150 feet east of the Sherman Highway and 10 feet from the crossing sign. An iron post stamped "2457 H." (751.388 meters or 2,465.178 feet.)

B. M. Square 5.—About 9.7 miles north of **Kent**, Sherman County, and 3.7 miles south of Grass Valley, at the southeast corner of the intersection of the Sherman Highway and a diagonal crossroad, and about 150 feet west of the railroad, on the top of a concrete culvert under the Sherman Highway. A chiseled square. (751.476 meters or 2,465.467 feet.) The connection with this bench mark was made by the Oregon Geographic Board.

2379 H (U. S. G. S.).—About 11.9 miles north of **Kent** and 1.7 miles south of Grass Valley, Sherman County, on the Oregon-Washington Railroad & Navigation Co. track, at mileage 40.4, at an abandoned road crossing and 100 feet east of the Sherman Highway. An iron post stamped "2379 H." (727.687 meters or 2,387.419 feet.)

2261 H (U. S. G. S.).—At **Grass Valley**, Sherman County, on the Oregon-Washington Railroad & Navigation Co. track, at south end of railroad station, 10 feet east of track, 3 feet from sidewalk. An iron post stamped "2261 H." (691.687 meters or 2,269.309 feet.)

2383 H (U. S. G. S.).—About 2.1 miles north of **Grass Valley**, Sherman County, on the Oregon-Washington Railroad & Navigation Co. track, road crossing at I. O. O. F. cemetery, 20 feet west of track, 10 feet south of road, and 150 feet west of Sherman Highway. An iron post stamped "2383 H." (728.878 meters or 2,391.326 feet.)

2155 H (U. S. G. S.).—Seven miles north of **Grass Valley**, Sherman County, on the Oregon-Washington Railroad & Navigation Co. track, at crossing of old Grass Valley-Moro main road, 12 feet west of track, 3 feet south of crossing sign. An iron post stamped "2155 H." (659.338 meters or 2,163.177 feet.)

1935 H (U. S. G. S.).—About 9.3 miles north of **Grass Valley**, Sherman County, on the Oregon-Washington Railroad & Navigation Co. track, 35 feet east of road crossing at Leonard More's ranch house, 40 feet north of crossing sign. An iron post stamped "1935 H." (592.380 meters or 1,943.500 feet.)

1782 H (U. S. G. S.).—At **Moro**, Sherman County, on the Oregon-Washington Railroad & Navigation Co. track, 15 feet north of station, 30 feet west of track. An iron post stamped "1782 H," with top 1 inch below cinder platform. (545.855 meters or 1,790.860 feet.)

1565 H (U. S. G. S.).—At **De Moss**, Sherman County, on the Oregon-Washington Railroad & Navigation Co. track, 60 feet south of station, 12 feet east of track, at crossing signpost. An iron post stamped "1565 H." (479.432 meters or 1,572.937 feet.)

1325 H (U. S. G. S.).—At **Nish**, Sherman County, on the Oregon-Washington Railroad & Navigation Co. track, southwest corner of office. An iron post stamped "1325 H." (406.547 meters or 1,333.814 feet.)

1527 H (U. S. G. S.).—One mile east of **Klondike**, Sherman County, on the Oregon-Washington Railroad & Navigation Co. track, 100 feet west of road crossing, 15 feet north of track at corner of fence. An iron post stamped "1527 H." (467.905 meters or 1,535.117 feet.)

1446 H (U. S. G. S.).—Two miles west of **Klondike**, Sherman County, on the Oregon-Washington Railroad & Navigation Co. track, in front of C. C. Kliney's

ranch house, 50 feet east of east face of house, 28 feet north of track at corner of fence. An iron post stamped "1416 H." (443.305 meters or 1,454.409 feet.)

1263 H (U. S. G. S.).—At **Wasco**, Sherman County, on the Oregon-Washington Railroad & Navigation Co. track, 25 feet south of the station, in the parking strip 18 feet east of track. An iron post stamped "1263 H." (387.364 meters or 1,270.877 feet.)

1021 H (U. S. G. S.).—About 2.9 miles north of **Wasco**, Sherman County, on the Oregon-Washington Railroad & Navigation Co. track, 60 feet west of the Sherman Highway, at a point $6\frac{1}{2}$ miles southerly from its junction with the Columbia River Highway, 100 feet north of road crossing at Sink ranch, 10 feet east of track. An iron post stamped "1021 H." (313.831 meters or 1,029.626 feet.)

O 25 (U. S. G. S.).—About $\frac{1}{2}$ mile east of **Biggs**, Sherman County, 330 feet east of the water tank, 140 feet west of the Oregon-Washington Railroad & Navigation Co. bridge over Spanish Hollow Creek, 27 feet south of main track, in wye forming connection with main line and Shaniko branch line. An iron post originally stamped "177 A" with these figures partially hammered out and the figures "164 H" substituted. (52.494 meters or 172.224 feet.)

For additional bench marks in the vicinity of **Biggs**, see page 67.

LINE II, OWYHEE, IDAHO, TO HUNT, WASH. (PART)

This is the Oregon portion of a line which follows the Oregon Short Line Railroad from Owyhee, Idaho, to Huntington, Oreg.; the Oregon-Washington Railroad & Navigation Co. from Huntington to Pendleton, Oreg.; and the Northern Pacific Railway from Pendleton, Oreg., to Hunt, Wash. The field work was done by F. H. Sewall, aid, between May 7 and October 4, 1904.

F.—About 1 mile south of **Nyssa**, Malheur County, in the north abutment of bridge 487.64 of the Oregon Short Line Railroad over Snake River, in the sandstone offset east of the track, 8 inches from the south edge and 2 inches from the east edge. The bottom of a 1-inch square hole lettered "U. S. B. M." This bridge has apparently been reconstructed and the bench mark could not be located in 1925. (665.942 meters or 2,184.845 feet.)

G.—At **Nyssa**, Malheur County, in the capstone of the northeast pillar of the railroad water tank, 4 inches from the north and east edges. The bottom of a 1-inch square hole. The water tank has been moved and the bench mark is destroyed. (664.799 meters or 2,181.095 feet.)

H.—About 2 miles north of **Nyssa**, Malheur County, on the Oregon Short Line Railroad right of way, at mileage 490.73 and 85 feet east of the track. A square hole in the top of a sandstone post. Not found in 1925. (660.712 meters or 2,167.686 feet.)

I.—About 4 miles south of **Ontario**, Malheur County, in the north abutment of bridge 494.51 of the Oregon Short Line Railroad, 17 poles north of mile pole 494, 8 inches from the west and south edges of the offset, in concrete. The bottom of a square hole. (658.526 meters or 2,160.514 feet.)

J.—About 5 miles south of **Ontario**, Malheur County, nine poles south of mile-post 494, in culvert No. 493.73 of the Oregon Short Line Railroad 19 feet east of the track, 3 inches from the east edge and 4 inches from the north edge of the culvert. The bottom of a square hole. (657.891 meters or 2,158.431 feet.)

2143 H (U. S. G. S.).—At **Ontario**, Malheur County, 12 feet east of the northeast corner of Main Street, and the street leading to the railroad station, at the Carter House. An iron post stamped "2143 H." (655.807 meters or 2,151.594 feet.)

K.—At **Ontario**, Malheur County, in the west face of the brick building of the Carter House, 3 feet north of the side door, and 5 feet above the ground. A copper bolt. (657.090 meters or 2,155.802 feet.)

L.—At **Ontario**, Malheur County, in the north face of the brick building occupied by the Golden Rule store, 5 feet east of the northeast corner, and 5 feet above the ground. A copper bolt. (656.882 meters or 2,155.121 feet.)

M.—At **Ontario**, Malheur County, in the south face of the brick building occupied by *Griffin & Staples's dry-goods store*, 3 feet west of the southeast corner and 5 feet above the ground. A copper bolt. (657.066 meters or 2,155.724 feet.) This bench mark could not be located in 1925.

For additional bench marks at and near Ontario, see pages 12, 41.

N.—About 1 mile north of **Ontario**, Malheur County, in the top of the north abutment of bridge 499.76 of the Oregon Short Line Railroad over Snake River, in the top of the sandstone offset, west of the track and 13 inches from the west and south edges. The bottom of a square hole. (654.888 meters or 2,148.578 feet.)

For bench marks in Idaho along the Oregon Short Line between Ontario and Huntington, Oreg., see United States Coast and Geodetic Survey Special Publication No. 18.

2079 A (U. S. G. S.).—About 2½ miles northeast of **Huntington**, Baker County, on the Oregon Short Line Railroad bridge over the Snake River, 3 feet east of the west end, on a stone stringer south of the track. An aluminum tablet stamped "2079 A." (635.957 meters or 2,086.469 feet.)

O.—About 2 miles northeast of **Huntington**, Baker County, one pole south of milepost 537, in the north abutment of bridge 537.03 of the Oregon Short Line Railroad over Burnt River, in the concrete offset east of the track, 13 inches from the east edge and 8 inches from the south edge. The bottom of a square hole. (636.084 meters or 2,086.886 feet.)

P.—About 1½ miles northeast of **Huntington**, Baker County, in the north abutment of bridge 537.79 of the Oregon Short Line Railroad over Burnt River, in the sandstone offset east of the track, 8 inches from the south edge and 10 inches from the east edge. The bottom of a square hole. (638.278 meters or 2,094.084 feet.)

Q.—About 1 mile northeast of **Huntington**, Baker County, in the south abutment of bridge 537.91 of the Oregon Short Line Railroad over Burnt River, 12 inches from the south edge, and 11 inches from the east edge of the sandstone offset east of the track. The bottom of a square hole. (639.131 meters or 2,096.883 feet.)

2105 A (U. S. G. S.).—At **Huntington**, Baker County, in the front wall of the brick building of the Huntington Mercantile Co., near the stairway between the grocery store and the drug store, in the sixth row of bricks above the stone foundation. Reported loose in 1903. An aluminum tablet stamped "2105 A." (644.146 meters or 2,113.336 feet.)

R.—At **Huntington**, Baker County, in the front wall of the brick building occupied by the Owl Drug Co. and the post office, midway between the show window and the stairway, west of the entrance of the store and 4 feet above the ground. A copper bolt stamped "U. S. B. M." (644.903 meters or 2,115.819 feet.) Could not be located in 1924.

S.—About 1 mile north of **Huntington**, Baker County, in the north abutment of bridge 388.40 of the Oregon-Washington Railroad & Navigation Co., over Burnt River in the concrete offset east of the track, 10 inches from the south edge and 16 inches from the east edge. The bottom of a square hole. (649.787 meters or 2,131.843 feet.)

T.—About 1¾ miles north of **Huntington**, Baker County, in the north abutment of bridge 387.75 of the Oregon-Washington Railroad & Navigation Co., over Burnt River in the concrete offset 14 feet east of the track, 10 inches from the south edge and 20 inches from the east edge. The bottom of a square hole. (655.003 meters or 2,148.956 feet.)

U.—About 3 miles north of **Huntington**, Baker County, in the north abutment of bridge 386.92 of the Oregon-Washington Railroad & Navigation Co., in the concrete offset east of the track, 10 inches from the south edge and 20 inches from the east edge. The bottom of a square hole. Not found in 1925. (660.026 meters or 2,165.436 feet.)

V.—About 3¾ miles north of **Huntington**, Baker County, in the south abutment of bridge 385.95 of the Oregon-Washington Railroad & Navigation Co., over Burnt River, in the concrete offset 15 feet east of the track, 10 inches from the south edge and 20 inches from the east edge. The bottom of a square hole. (665.760 meters or 2,184.248 feet.)

2215 A (U. S. G. S.).—At **Lime**, Baker County, 370 feet south of bridge 384.42 of the Oregon-Washington Railroad & Navigation Co., 30 feet east of the track and 15 feet north of the station sign. An iron post stamped "2215 A." (677.544 meters or 2,222.909 feet.)

W.—About 0.25 mile north of **Huntington**, Baker County, 0.15 mile north of bridge 384.42 of the Oregon-Washington Railroad & Navigation Co., 30 feet

west of the track. A square cut in the top of a limestone post, marked "U. S. B. M." Not found in 1924. (679.374 meters or 2,228.913 feet.)

X.—About 1.25 miles north of **Lime**, Baker County, in offset of easterly concrete abutment of bridge 383.27 of the Oregon-Washington Railroad & Navigation Co., 8 feet east of the track, 14 inches from the north and east edges. The bottom of a square hole. (683.585 meters or 2,242.729 feet.)

Y.—About 0.35 mile south from the easterly headblock of **Jett** siding, Baker County, in bridge seat of westerly concrete abutment of bridge 381.66 of the Oregon-Washington Railroad & Navigation Co., 14 feet east of the track, 2.6 feet from the east edge, and 1.3 feet from the south edge. The bottom of a square hole, letter "Y" on south side. (695.798 meters or 2,282.797 feet.)

2369 A (U. S. G. S.).—About 1.28 miles south of **Weatherby**, Baker County, 550 feet north of the north portal of tunnel 6 of the Oregon-Washington Railroad & Navigation Co., 40 feet north of the track and 8 feet east from the north and south fence. An iron post stamped "2369 A." (724.457 meters or 2,376.822 feet.)

Z.—About 0.3 mile north of **Weatherby**, Baker County, 200 feet south of bridge 377.09 of the Oregon-Washington Railroad & Navigation Co., and 45 feet west of the track. An iron pipe. (734.554 meters or 2,409.949 feet.)

A 2.—About 0.56 mile north of **Weatherby**, Baker County, in the north abutment of bridge 376.84 of the Oregon-Washington Railroad & Navigation Co., 13 feet east of the track in the concrete offset of the abutment, 1½ feet from the south edge and 1.75 feet from the east edge. The bottom of a square hole. (735.394 meters or 2,412.705 feet.)

2518 A (U. S. G. S.).—About 3¾ miles north of **Weatherby**, Baker County, about 1,000 feet north of bridge 373.76 of the Oregon-Washington Railroad & Navigation Co., 13 feet south of old abandoned wagon road, 23 feet north of the track, and 4 feet south of the fence. An iron post stamped "2518 A." (770.031 meters or 2,526.343 feet.)

B 2.—About 2.8 miles south of **Durkee**, Baker County, 0.74 mile north of Nelson station sign at mileage 371.67, 2,440 feet south of pile trestle bridge 370.30 of the Oregon-Washington Railroad & Navigation Co., and 50 feet east of the track. An iron pipe. Not located in 1924. (780.672 meters or 2,561.254 feet.)

2647 A (U. S. G. S.).—At **Durkee**, Baker County, 1 foot from the northeast corner of the Oregon-Washington Railroad & Navigation Co. depot and 54 feet north of the track. An iron post stamped "2647 A." (809.477 meters or 2,655.760 feet.)

C 2.—About 2 miles northwest of **Durkee**, Baker County, in the west concrete abutment of bridge 366.74 of the Oregon-Washington Railroad & Navigation Co., southwest of the track in the offset of the abutment, 2 feet from the south edge and 16 inches from the west edge. The bottom of a square hole. Not found in 1924. (834.180 meters or 2,736.806 feet.)

D 2.—About 0.36 mile south of **Leonard**, Baker County, 1 mile northwest of bridge 366.74 of the Oregon-Washington Railroad & Navigation Co., and 2 feet from the fence. A square hole in the top of a limestone post. Not found in 1924. (858.848 meters or 2,817.737 feet.)

3139 A (U. S. G. S.).—At **Unity**, Baker County, 125 feet back of the section house, 185 feet east of the track, and 12 feet east of "Old Oregon Trail" highway. An iron post stamped "3139 A." (959.069 meters or 3,146.546 feet.)

E 2.—About ¼ mile north of **Unity**, Baker County, in the offset of the easterly concrete abutment of bridge 361.64 of the Oregon-Washington Railroad & Navigation Co., 8 inches from the east and north edges. The bottom of a square hole. Not found in 1924. (957.336 meters or 3,140.800 feet.)

F 2.—About 2¼ miles southeast of **Pleasant Valley**, Baker County, at mileage 357.7 of the Oregon-Washington Railroad & Navigation Co., and 80 feet north of 18-inch cast-iron pipe culvert. A square hole in the top of a stone post marked "U. S. B. M." (1,077.000 meters or 3,533.457 feet.)

3818 A (U. S. G. S.).—About 1½ miles north of **Pleasant Valley**, Baker County, 100 feet southwest of the Oregon-Washington Railroad & Navigation Co. tracks, opposite milepost 354.2, and 115 feet south of cattle guard 354.18. Reported in battered condition 1904. An iron post stamped "3818 A." (1,166.423 meters or 3,826.839 feet.)

G 2.—About 2½ miles west of **Pleasant Valley**, Baker County, four poles east of mile pole 367 of the Oregon-Washington Railroad & Navigation Co., 40 feet south of the track at a road crossing, and 10 feet east of a telegraph pole. An iron pipe. (1,205.350 meters or 3,954.552 feet.) Could not be located in 1924.

H 2.—About 1 mile southeast of **Quartz**, Baker County, on wing wall at southwest corner of Oregon-Washington Railroad & Navigation Co., concrete culvert 348.81. The bottom of a square hole. (1,132.685 meters or 3,716.151 feet.)

3646 A (U. S. G. S.).—At **Quartz**, Baker County, 170 feet northerly from the Oregon-Washington Railroad & Navigation Co. track near mileage 347.71, north of the Old Oregon Trail and north of a section house. An iron post stamped "3646 A." (1,113.821 meters or 3,654.261 feet.)

I 2.—About 2 miles south of **Baker**, Baker County, in top of back wall of west-erly concrete abutment of bridge 343.94 of the Oregon-Washington Railroad & Navigation Co., east of the track in an offset of the abutment, 18 inches from the east edge. The bottom of a square hole. (1,065.485 meters or 3,495.678 feet.)

3433 A (U. S. G. S.).—At **Baker**, Baker County, in the astronomic pier in the front yard of the public high school. An aluminum tablet stamped "3433 A." (1,048.780 meters or 3,440.872 feet.) Could not be located in 1924.

J 2.—At **Baker**, Baker County, in the north face of the brick building of the Sage and Grace Mercantile Co., 4 feet above the ground, and 10 feet east of the northwest corner of the building. A copper bolt lettered "U. S. B. M." (1,049.587 meters or 3,443.520 feet.) Could not be located in 1924.

K 2.—At **Baker**, Baker County, in the east face of Elks Hall, 2 feet from the northeast corner and, 4 feet above the ground. A brass disk. (1,050.591 meters or 3,446.814 feet.)

L 2.—At **Baker**, Baker County, in the north face of the city hall building, 2 feet from the northwest corner, and 4 feet above the ground. A brass disk. (1,051.216 meters or 3,448.864 feet.)

M 2.—About 3 miles from **Baker**, Baker County, toward Portland, at mileage 338.8 of the Oregon-Washington Railroad & Navigation Co. A square hole in top of limestone post. (1,028.044 meters or 3,372.841 feet.)

3338 A (U. S. G. S.).—About 4.5 miles from **Haines**, Baker County, toward Huntington, at mileage 335.94 of the Oregon-Washington Railroad & Navigation Co., 136 feet west of Old Oregon Trail highway, 100 feet toward Portland from pile trestle bridge 335.96, 56.5 feet right of track (facing Huntington), 10 feet from private grade crossing toward Huntington. An iron pipe stamped "3338 A." (1,019.898 meters or 3,346.115 feet.)

N 2.—About 1.35 miles from **Haines**, Baker County, toward Huntington, at mileage 332.75 of the Oregon-Washington Railroad & Navigation Co., 2,670 feet toward Huntington from pile trestle bridge 332.24, 47 feet right of track (facing Huntington), and 3 feet inside right-of-way fence. An iron pipe. (1,014.114 meters or 3,327.139 feet.)

O 2.—About 1.9 miles from **Haines**, Baker County, toward Portland, at mileage 329.51 of the Oregon-Washington Railroad & Navigation Co., 45.3 feet left of track (facing Portland), 30 feet north of County Road crossing. An iron pipe. (1,018.366 meters or 3,341.089 feet.)

3372 A (U. S. G. S.).—At **Hutchinson**, Baker County, at mileage 326.75 of the Oregon-Washington Railroad & Navigation Co., on right of way, 1,500 feet toward Portland from County Road crossing, 41.3 feet to right of center of main track (facing Portland), 8 feet inside right-of-way fence. An iron pipe stamped "3372 A." (1,030.123 meters or 3,379.662 feet.)

P 2.—About 1.72 miles from **North Powder**, Union County, toward Huntington, at mileage 323.82 of the Oregon-Washington Railroad & Navigation Co., 50 feet toward Huntington from pile trestle bridge 323.82, 45 feet left of track (facing Huntington). An iron pipe. (1,003.625 meters or 3,292.726 feet.)

3233 A (U. S. G. S.).—At **North Powder**, Union County, 155 feet from water tank, 652 feet from pile trestle bridge 322.09 of the Oregon-Washington Railroad & Navigation Co., 980 feet from depot, and 33.2 feet left (facing Huntington) of main track. An iron post stamped "3233 A." (988.212 meters or 3,242.159 feet.)

Q 2.—At **North Powder**, Union County, in the southeast wall of the I. O. O. F. building, 4 feet southwest from the east corner, and 5 feet above the ground. A copper bolt stamped "U. S. B. M." (992.577 meters or 3,256.479 feet.) The copper bolt has been removed but the hole where it set remains.

R 2.—About 3.25 miles from **North Powder**, Union County, toward Portland, 495 feet toward Portland from pile trestle bridge 318.95 of the Oregon-Washington Railroad & Navigation Co., 15 feet right (facing Huntington) of center of track, 5 feet above base of rail in south face of rock bluff. The center of a cross at the bottom of a square hole. (975.300 meters or 3,199.797 feet.)

S 2.—About 3.6 miles from **North Powder**, Union County, toward Portland, in an offset 2 feet above bridge seat of westerly concrete abutment of bridge 318.50 of the Oregon-Washington Railroad & Navigation Co., 12.5 feet right (facing Huntington) of center of track, and 2.4 feet from face of back wall. The bottom of a square hole. (972.014 meters or 3,189.016 feet.)

T 2.—About 3.8 miles from **North Powder**, Union County, along the Oregon-Washington Railroad & Navigation Co. track toward Portland, at mileage 318.29, in the westerly concrete pier of bridge 318.29. The bottom of a square hole 13.5 feet west of the center line of track. (971.932 meters or 3,188.747 feet.)

3228 A (U. S. G. S.).—Five miles toward Portland from **North Powder**, Union County, 188 feet from westerly portal of tunnel 5, 16 feet east of the track at mileage 317.1 of the Oregon-Washington Railroad & Navigation Co. An iron post stamped "3228 A." (986.138 meters or 3,235.354 feet.)

U 2.—About 3 miles southwest of **Telocaset**, Union County, 90 feet north of the track at mileage 315.7 of the Oregon-Washington Railroad & Navigation Co. An iron pipe. (1,005.869 meters or 3,300.088 feet.) Could not be located in 1925.

V 2.—About $\frac{1}{4}$ mile south of **Telocaset**, Union County, at mileage 312.85 of the Oregon-Washington Railroad & Navigation Co., in the northwest fence corner of a private road crossing. The bottom of a square hole in the top of a stone post lettered "U. S. B. M." (1,048.017 meters or 3,438.369 feet.) Could not be located in 1925.

3440 A (U. S. G. S.).—At **Telocaset**, Union County, 18 feet north of the Oregon-Washington Railroad & Navigation Co. tracks and 3 feet east of the east corner of the fence at the section house. An iron post stamped "3440 A." Not found in 1924. (1,050.530 meters or 3,446.613 feet.)

W 2.—About 1 mile south of **Crooks**, Union County, eight telegraph poles north of milepost 310 of the Oregon-Washington Railroad & Navigation Co., four telegraph poles north of semaphore No. 309.9, $5\frac{1}{2}$ rail lengths south of Culvert No. 309.70, 36 feet east of center of the track. An iron pipe. (989.950 meters or 3,247.861 feet.)

3021 A (U. S. G. S.).—About 1.4 miles south from **Pyle**, Union County, six telegraph poles north from milepost 307 of the Oregon-Washington Railroad & Navigation Co., $2\frac{1}{2}$ rail lengths toward Huntington from culvert No. 306.80, 13 feet south of the center of the track. An iron post stamped "3021 A." (922.670 meters or 3,027.127 feet.)

X 2.—About $1\frac{1}{4}$ miles southeast of **Union Junction**, Union County, one telegraph pole southeast from milepost 304 of the Oregon-Washington Railroad & Navigation Co., $1\frac{2}{3}$ rail lengths southeast from semaphore No. 304.1, about 37.5 feet east of center of track. An iron pipe. (857.384 meters or 2,812.934 feet.)

Y 2.—At **Union**, Union County, in the east face of the brick-and-stone building occupied by Conner's (Inc.), 20 inches from the southeast corner, and 4 feet above the ground. A copper bolt stamped "U. S. B. M." (851.206 meters or 2,792.665 feet.)

Z 2.—At **Union**, Union County, in the north side of the brick building occupied by the Union Cash Grocery Co., 2 feet from the northeast corner. A brass disk. (850.117 meters or 2,789.092 feet.)

U. S. G. S. Union.—At **Union**, Union County, in the east face of the Masonic Hall, 3 feet from the southeast corner. An aluminum tablet stamped "2783." (849.962 meters or 2,788.583 feet.)

A 3.—At **Union**, Union County, in the west face of the First National Bank Building, 3 feet from the northwest corner, and 4 feet above the ground. A copper bolt stamped "U. S. B. M." (851.266 meters or 2,792.862 feet.) This bench mark was destroyed when the bank building was remodeled.

2705 A (U. S. G. S.).—About $\frac{3}{4}$ mile northwest of **Union Junction**, Union County, 9 telegraph poles northwest from milepost 302, about $17\frac{2}{3}$ rail lengths northwest from yard limit sign, $27\frac{1}{2}$ rail lengths northwest from cattle guard 301.92, $34\frac{1}{2}$ rail lengths northwest from semaphores 301.9 and 302.0, 44 feet northeast of center of tracks. An iron post stamped "2705 A." (826.444 meters or 2,711.425 feet.)

B 3.—About $1\frac{1}{4}$ miles southeast from **Hot Lake**, Union County, three telegraph poles southeast from mile pole 300 of the Oregon-Washington Railroad & Navigation Co., about 41 feet northeast of the center of the track. Iron pipe. (823.117 meters or 2,700.510 feet.)

2696 A (U. S. G. S.).—About $2\frac{1}{2}$ miles northwest from **Hot Lake**, Union County, 24 telegraph poles northwest from mile pole 297 of the Oregon-Washington Railroad & Navigation Co., 17 telegraph poles northwest from semaphore 296.8, $14\frac{1}{2}$ telegraph poles northwest from a private-road crossing, $5\frac{1}{2}$ telegraph poles northwest from a concrete bridge on the Old Oregon Trail, about 47.5 feet southwest of track just inside of right-of-way fence, 30 feet northeast of Old Oregon Trail. An iron post stamped "2696 A," extending 1 foot above the ground surface. (823.522 meters or 2,701.838 feet.)

C 3.—At **Lone Tree**, Union County, $11\frac{1}{2}$ telegraph poles northwest from milepost 295 of the Oregon-Washington Railroad & Navigation Co., 70 feet southeast from concrete telephone dispatcher's booth, about 43.5 feet northeast of center of the track. The bench mark extends about 10 inches above the ground surface and is an iron pipe. (825.359 meters or 2,707.865 feet.)

D 3.—About $2\frac{1}{4}$ miles southeast of **La Grande**, Union County, $14\frac{1}{2}$ telegraph poles northwest from mile pole 293 of the Oregon-Washington Railroad & Navigation Co., 4 rail lengths northwest from semaphore No. 292.5, 33 feet northeast of the Old Oregon Trail, 45 feet southwest of center of the track, the bench mark extends about 15 inches above the ground surface. An iron pipe. (832.538 meters or 2,731.419 feet.)

2773 A (U. S. G. S.).—At **La Grande**, Union County, 160 feet northeast of the road crossing at First Street, 30 feet north of the northwest corner of the railroad tool house, and 4 feet west of a telegraph pole. An iron post, not found in 1924. (847.144 meters or 2,779.338 feet.)

E 3.—At **La Grande**, Union County, in the north face of the brick building between Jefferson Avenue and the railroad tracks formerly occupied by the grocery store of J. W. White, but now occupied by a second-hand store, 1 foot from the northeast corner of the building, and 4 feet above the ground. The bench mark was not located in 1924, but it may be behind a large metal sign. A copper bolt stamped "U. S. B. M." (848.897 meters or 2,785.090 feet.)

F 3.—At **La Grande**, Union County, in the front of the brick-and-stone building known as Steward's Opera House. In the limestone pillar just east of the entrance of the stairway on the north side of Adams Avenue, 100 feet east of Depot Street, about 4 feet above the ground. A brass disk. (849.833 meters or 2,788.160 feet.)

G 3.—At **La Grande**, Union County, in the stone step at the entrance of the brick and stone building occupied in 1924 by the J. C. Penney Co., on the west side of Depot Street south of the alley between Adams Avenue and Washington Avenue, 25 feet south of south alley line. A brass disk. (849.318 meters or 2,786.470 feet.)

2782 A (U. S. G. S.).—At **La Grande**, Union County, in the north face of the Foley Hotel, in the second course of plaster facing of the wall on the Chestnut Street side. An aluminum tablet stamped "2782 A." (849.396 meters or 2,786.728 feet.)

H 3.—About $2\frac{1}{2}$ miles toward Portland from **La Grande**, Union County, in the bridge seat of concrete abutment at Huntington end of bridge 288.02 of the Oregon-Washington Railroad & Navigation Co., 1 foot from face of back wall, 4 inches inside of capstone, and $4\frac{1}{4}$ feet to the right (facing Huntington) of ball of right-hand rail. The bottom of a square hole. (868.014 meters or 2,847.810 feet.)

I 3.—About $2\frac{1}{2}$ miles westerly of **La Grande**, Union County, 18 telegraph poles westerly from milepost 288 of the Oregon-Washington Railroad & Navigation Co., 20 feet south of the center of the main track, three-quarter rail length westerly from crossing of road leading to golf club, three-quarter rail length easterly from cattle guard No. 287.56, opposite culvert No. 287.57, 50 feet north of the Old Oregon Trail. An iron pipe. (871.401 meters or 2,858.921 feet.)

2897 A (U. S. G. S.).—At **Perry**, Union County, $10\frac{1}{2}$ telegraph poles east from mile pole 286, 4 rail lengths east from bridge 286.20 of the Oregon-Washington Railroad & Navigation Co., 54 feet north of the center of the main track, 12 feet west of east face of Grande Ronde Lumber Co. store, 6 inches south of south face of store. Iron post extending 10 inches above the ground, stamped "2897 A." (884.839 meters or 2,903.009 feet.)

J 3.—About $1\frac{1}{2}$ miles east from **Hilgard**, Union County, $10\frac{3}{4}$ telegraph poles west from mile pole 284 of the Oregon-Washington Railroad & Navigation Co., $4\frac{1}{2}$ rail lengths east from culvert No. 283.68, 8 rail lengths west from mile

pole 283.75, 100 feet south of the Old Oregon Trail, 25 feet north of the center of the main track. An iron pipe extending about 1 foot above the ground. (904.393 meters or 2,967.163 feet.)

3001 A (U. S. G. S.).—At **Hilgard**, Union County, 28 feet north of the main track of the Oregon-Washington Railroad & Navigation Co., 46 feet west from west face of depot. An iron post stamped "3001 A," extending about 1 foot off the ground. (916.714 meters or 3,007.586 feet.)

3581 A (U. S. G. S.).—About $5\frac{1}{2}$ miles toward Portland from **Hilgard**, Union County, $\frac{1}{4}$ mile toward Portland from mile pole 277 of the Oregon-Washington Railroad & Navigation Co., and 15 feet south of the tracks. An iron post stamped "3581 A." (1,093.755 meters or 3,588.428 feet.) Could not be located in 1925.

K 3.—About $2\frac{1}{2}$ miles toward Huntington from **Kamela**, Union County, $\frac{1}{4}$ mile toward Portland from mile pole 274 of the Oregon-Washington Railroad & Navigation Co., and 50 feet east of the track. An iron pipe. (1,023.698 meters or 3,358.583 feet.) Could not be located in 1925.

4199 A (U. S. G. S.).—At **Kamela**, Union County, 155 feet toward Huntington from the Portland end of the Oregon-Washington Railroad & Navigation Co. depot, and 100 feet right of the main track facing Huntington. An iron post stamped "4199 A." (1,281.832 meters or 4,205.476 feet.)

3958 A (U. S. G. S.).—About 3.5 miles toward Huntington from **Meacham**, Umatilla County, $\frac{1}{4}$ mile toward Portland from mile pole 269 of the Oregon-Washington Railroad & Navigation Co., and 23 feet south of the track. An iron post stamped "3958 A." (1,208.652 meters or 3,965.385 feet.)

L 3.—About $1\frac{1}{2}$ miles toward Huntington from **Meacham**, Umatilla County, $\frac{3}{4}$ mile toward Huntington from mile pole 266 of the Oregon-Washington Railroad & Navigation Co., and 40 feet east of the track. A square hole in the top of a lava post. (1,145.262 meters or 3,757.414 feet.) Could not be located in 1925.

3679 A (U. S. G. S.).—At **Meacham**, Umatilla County, 352 feet north of the Oregon-Washington Railroad & Navigation Co. depot at mileage 265, and 18 feet east of the track. An iron post stamped "3679 A." (1,121.507 meters or 3,679.478 feet.)

3454 A (U. S. G. S.).—About 2.5 miles toward Portland from **Meacham**, Umatilla County, $\frac{3}{4}$ mile toward Meacham from mile pole 262 of the Oregon-Washington Railroad & Navigation Co., and 15 feet north of the track. An iron post stamped "3454 A." (1,054.839 meters or 3,460.751 feet.) Could not be located in 1925.

M 3.—About 3.5 miles toward Portland from **Meacham**, Umatilla County, and about 0.3 mile toward Portland from mile pole 262 of the Oregon-Washington Railroad & Navigation Co. A square hole in the top of a lava post. (1,021.561 meters or 3,351.572 feet.) Could not be located in 1925.

N 3.—One-half mile toward Portland from **Porter**, Umatilla County, in the bridge seat of the concrete abutment at Portland end of bridge 260.22 of the Oregon-Washington Railroad & Navigation Co., 10 feet left of center of track facing Huntington, 2 feet from face of back wall, and $1\frac{1}{2}$ feet from face of bridge seat. The bottom of a square hole lettered "U. S. B. M." (971.995 meters or 3,188.953 feet.)

O 3.—About $1\frac{1}{2}$ miles south of **Huron**, Umatilla County, in the north abutment of bridge 258.95 of the Oregon-Washington Railroad & Navigation Co., in the offset 8 feet west of the track. A square hole. (933.204 meters or 3,061.982 feet.)

P 3.—About $\frac{1}{2}$ mile north of **Huron**, Umatilla County, in the south concrete abutment of bridge 257.18 of the Oregon-Washington Railroad & Navigation Co., in the top of the offset 13 feet east of the track and 8 inches from the outer edge of the abutment. A square hole. (882.060 meters or 2,893.892 feet.)

Q 3.—About 2 miles north of **Huron**, Umatilla County, at mileage 255.5 of the Oregon-Washington Railroad & Navigation Co., 40 feet south of the track. An iron pipe. Not found in 1924. (846.388 meters or 2,776.858 feet.)

2570 A (U. S. G. S.).—About 1 mile south of **North Fork**, Umatilla County, 540 feet south of bridge 252.52 of the Oregon-Washington Railroad & Navigation Co., $27\frac{1}{2}$ feet east of the track. An iron post stamped "2570 A." (785.134 meters or 2,575.894 feet.)

R 3.—About 0.9 mile south of **North Fork**, Umatilla County, in the north concrete abutment of bridge 252.52 of the Oregon-Washington Railroad & Naviga-

tion Co., in the top of the offset 14 feet west of the track. A square hole lettered "U. S. B. M." (780.873 meters or 2,561.914 feet.)

S 3.—About 0.4 mile northerly of **North Fork**, Umatilla County, along the Oregon-Washington Railroad & Navigation Co., in the south abutment of bridge No. 251.18 in the offset 12 feet east of the track. The bottom of a square hole. (755.930 meters or 2,480.080 feet.)

T 3.—About 2½ miles south of **Duncan**, Umatilla County, at mileage 250.66 of the Oregon-Washington Railroad & Navigation Co., 33 feet east of the track. A square hole in the top of a stone post, marked "U. S. B. M." (745.514 meters or 2,445.908 feet.)

2264 A (U. S. G. S.).—About 0.6 mile north of **Duncan**, Umatilla County, 150 feet south of the section house, and 30 feet west of the Oregon-Washington Railroad & Navigation Co. track. An iron post stamped "2264 A." Could not be located in 1924. (691.742 meters or 2,269.490 feet.)

U 3.—About 1 mile northwest of **Duncan**, Umatilla County, in the north abutment of bridge 247.22 of the Oregon-Washington Railroad & Navigation Co., in the top of the offset east of the track. A brass disk. (684.919 meters or 2,247.105 feet.)

V 3.—At **Sloan** siding, Umatilla County, 433 feet westerly from iron culvert No. 245.67, and 30 feet northerly from the Oregon-Washington Railroad & Navigation Co. An iron pipe in the line of the telegraph poles northeast of the track. (657.911 meters or 2,158.496 feet.)

2023 A (U. S. G. S.).—About 6 miles southeast of **Gibbon**, Umatilla County, and 1.3 miles south of Conway at mileage 243.5 of the Oregon-Washington Railroad & Navigation Co., 23 feet south of the track, and 30 feet east of the whistle post. An iron post stamped "2023 A." (618.120 meters or 2,027.949 feet.) Could not be located in 1924.

W 3.—About 3.6 miles southeast of **Gibbon**, Umatilla County, 16 feet northerly from culvert 240.68 of the Oregon-Washington Railroad & Navigation Co., 36 feet west of the track, and 18 feet west of a fence. An iron post. (580.135 meters or 1,903.327 feet.)

X 3.—About 1.6 miles south of **Gibbon**, Umatilla County, in the north abutment of bridge 238.67 of the Oregon-Washington Railroad & Navigation Co., in the top of the offset 11 feet west of the track. A brass disk. (554.640 meters or 1,819.681 feet.)

1744 A (U. S. G. S.).—At **Gibbon**, Umatilla County, 150 feet east of the Oregon-Washington Railroad & Navigation Co., 40 feet north of the track, and 4 feet east of the first telegraph pole from the depot. An iron post stamped "1744 A." (533.213 meters or 1,749.383 feet.) Could not be located in 1924.

Y 3.—About 2½ miles east of **Thorn Hollow**, Umatilla County, 40 feet north of the track of the Oregon-Washington Railroad & Navigation Co., 265 feet east of an 8-foot square concrete manhole of the Pendleton City aqueduct which is 60 feet south of the track at mileage 234.6. A square hole in the top of a stone post marked "U. S. B. M." (503.980 meters or 1,653.474 feet.)

1523 A (U. S. G. S.).—About 1 mile westerly from **Thorn Hollow**, Umatilla County, 245 feet westerly from cattle guard 231.11 of the Oregon-Washington Railroad & Navigation Co., 270 feet west of a road crossing, 17 feet north of the track, and 4 feet east of a telegraph pole. An iron post stamped "1523 A." (465.783 meters or 1,528.157 feet.)

Z 3.—About 1.5 miles westerly of **Thorn Hollow**, Umatilla County, in the top of the raised offset of the east concrete abutment of bridge 230.57 of the Oregon-Washington Railroad & Navigation Co., 13 feet south of the track, 2 feet from the west edge of the concrete. The bottom of a square hole. (463.734 meters or 1,521.434 feet.)

A 4.—About ½ mile east of **Cayuse**, Umatilla County, at mileage 227.58 of the Oregon-Washington Railroad & Navigation Co., and 20 feet north of the track. An iron pipe. (437.053 meters or 1,433.898 feet.) Not found in 1924.

B 4.—About ⅓ mile west of **Cayuse**, Umatilla County, in the offset of the easterly abutment of bridge 226.86 of the Oregon-Washington Railroad & Navigation Co. The bottom of a square hole. (428.043 meters or 1,404.338 feet.) Not found in 1924.

1355 A (U. S. G. S.).—About ¾ mile east of **Minthorn**, Umatilla County, 16 poles east of milepost 225 of the Oregon-Washington Railroad & Navigation Co., 6 rail lengths west from semaphore 225.5, 19 feet south of the center of the track. An iron post stamped "1355 A." (414.139 meters or 1,358.721 feet.)

C 4.—About ¾ mile west of **Minthorn**, Umatilla County, 5½ poles west of milepost 224 of the Oregon-Washington Railroad & Navigation Co., 4½ rail

lengths west of culvert No. 223.83, $14\frac{1}{2}$ rail lengths west of semaphore 223.8, 25 feet north of the center of the track. A square hole in a square cut stone marked "U. S. B. M." (405.307 meters or 1,329.745 feet.)

1205 A (U. S. G. S.).—At **Mission**, Umatilla County, six poles west of mile pole 221 of the Oregon-Washington Railroad & Navigation Co., 1 rail length west of semaphores 220.8 and 220.7, 25 feet north of the center of the track, 15 feet east of east fence of section-house grounds. An iron post stamped "1205 A." (368.549 meters or 1,209.148 feet.)

D 4.—At **Pendleton**, Umatilla County, in a building occupied by a furniture store in 1924, on the south side of East Webb Street, 50 feet west of the intersection with Cottonwood Street, in a stone stringer under the show window. A brass disk. (326.691 meters or 1,071.819 feet.)

E 4.—At **Pendleton**, Umatilla County, at the entrance to the building occupied by the Delta Confectionery store, on Main Street. A brass disk. May have been destroyed when the entrance was remodeled. (326.011 meters or 1,069.588 feet.)

F 4.—At **Pendleton**, Umatilla County, in the east wall of the brick building occupied by the Sturgis & Storie Co., at the corner of Court and Thompson Streets, 4 feet above the ground, and 8 inches from the southeast corner. A copper bolt stamped "U. S. B. M." (327.838 meters or 1,075.582 feet.)

1074 A (U. S. G. S.).—At **Pendleton**, Umatilla County, on the south side of the west entrance of the Umatilla County courthouse. An aluminum tablet stamped "1074 A." (328.580 meters or 1,078.016 feet.)

P 40.—At **Pendleton**, Umatilla County, at the Pacific Power & Light Co. outdoor substation on the west side of College Street, in the northeast corner of the concrete base of the voltage regulator. A power company bronze tablet stamped "P-40-1076." (327.978 meters or 1,076.041.) This bench mark was established by the Pacific Power & Light Co.

P 39.—At **Pendleton**, Umatilla County, on a window ledge at the northeast corner of the Pendleton Post Office Building. A brass tablet of the United States Geological Survey stamped "P-39-1068." (325.602 meters or 1,068.247 feet.) This bench mark was established by the Pacific Power & Light Co.

G 4.—About 1 mile east of **Pendleton**, Umatilla County, in the west abutment of the Northern Pacific Railway bridge over the Umatilla River, in the top of the offset, north of the track. A brass disk. (334.778 meters or 1,098.350 feet.)

H 4.—Near **Pendleton**, Umatilla County, on the north edge of the right of way of the Northern Pacific Railway, 26 feet north of the center line of the tracks, near the center of a long curve to the north. This bench mark is exactly 3 miles east from Main Street, in Pendleton, as measured along the pavement of the Oregon-Washington highway and is opposite a point 0.1 mile east of a rock cliff on the south side of the highway. The bottom of a square hole in the top of a stone post. (357.796 meters or 1,173.869 feet.)

I 4.—About 2 miles southwest of **Fulton**, Umatilla County, at mile pole 35¹ of the Northern Pacific Railway, and 30 feet west of the track. An iron pipe. (422.895 meters or 1,387.448 feet.)

J 4.—About 1 mile north of **McCormach**, Umatilla County, at mile post 31¹ of the Northern Pacific Railway, and 30 feet north of the track. An iron post. (503.702 meters or 1,652.563 feet.)

K 4.—About 4 miles south of **Helix**, Umatilla County, at mile pole 27¹ of the Northern Pacific Railway, 30 feet west of the track. An iron post. (530.165 meters or 1,739.383 feet.)

L 4.—About $1\frac{1}{4}$ miles north of **Helix**, Umatilla County, at mile pole 22¹ of the Northern Pacific Railway, and 40 feet west of the track. An iron pipe. (548.335 meters or 1,798.995 feet.)

M 4.—Near **Smeltz**, Umatilla County, one pole south of mile pole 19¹ of the Northern Pacific Railway, in a concrete culvert east of the track. The bottom of a square hole. (542.790 meters or 1,780.804 feet.)

N 4.—Near **Smeltz**, Umatilla County, at mile pole 18¹ of the Northern Pacific Railway, 50 feet west of the track. An iron pipe. (507.167 meters or 1,663.930 feet.)

O 4.—About 1 mile north of **Stanton**, Umatilla County, at mile pole 17¹ of the Northern Pacific Railway, in the concrete culvert west of the track. The

¹As existing in 1904. The mileposts have since been relocated and moved approximately 1,200 feet nearer Hunt. That is, all bench marks described as being at the mile pole are about 1,200 feet south of it.

bottom of a square hole lettered "U. S. B. M." (474.431 meters or 1,556.529 feet.)

P 4.—About $1\frac{1}{4}$ miles south of **Ring**, Umatilla County, one pole north of mile pole 12¹ of the Northern Pacific Railway, 15 feet west of the track. A square in the top of a stone post. (317.716 meters or 1,042.373 feet.)

For bench marks along the Northern Pacific Railway between **Ring**, **Oreg.**, and **Hunt**, **Wash.**, see United States Coast and Geodetic Survey Special Publication No. 18.

LINE III, KIRK, OREG., TO ROSEVILLE, CALIF. (PART)

This is the Oregon portion of a line which follows the Southern Pacific Railroad from **Kirk**, **Oreg.**, southward through **Weed**, **Redding**, **Tehama**, and **Marysville**, to **Roseville**, **Calif.** A spur line was run along the highway from **Chiloquin** to **Klamath Indian Agency**, **Oreg.** The field work was done between June 25 and November 20, 1919, by **C. A. Egner**, junior hydrographic and geodetic engineer, assisted by **L. J. Chawner**, extra observer, who operated a subparty.

I 5.—At **Kirk**, **Klamath County**, on the Southern Pacific Railroad, 20 feet east of milepost 475, 140 feet south of the freight-warehouse platform at the road crossing, and 50 feet east of the track on the right of way. A concrete post with disk in top. (1,380.547 meters or 4,529.345 feet.)

J 5.—About 1 mile south of **Kirk**, **Klamath County**, on the Southern Pacific Railroad, 400 feet north of milepost 474, 300 feet south of a road crossing, and 28 feet east of the track on the right of way. An iron post. (1,384.736 meters or 4,543.088 feet.)

H 5.—About 3 miles south of **Kirk**, **Klamath County**, on the Southern Pacific Railroad, at milepost 472, 20 feet east of and 2 feet below the track, in the sloping face of a large boulder on the right of way. A brass disk. (1,393.636 meters or 4,572.287 feet.)

G 5.—About $3\frac{1}{2}$ miles south of **Sprague**, **Klamath County**, near **Meva**, on the Southern Pacific Railroad, 850 feet north of milepost 466, and 8 feet east of the track on culvert No. 466 A. A brass disk. (1,319.885 meters or 4,330.323 feet.)

K 5 (S. P.).—About $3\frac{1}{2}$ miles north of **Chiloquin**, **Klamath County**, near **Meva**, on the Southern Pacific Railroad, 350 feet north of milepost 465, 8 feet east of the track, on culvert No. 465 A, a Southern Pacific Railroad bench mark. The top of a round-headed iron bolt. (1,309.360 meters or 4,295.792 feet.)

L 5 (S. P.).—At **Chiloquin**, **Klamath County**, on the Southern Pacific Railroad, 1,200 feet north of the depot, 300 feet north of the north end of the siding, and 10 feet east of the track, in the northwest pier of a water tank. The top of a round-headed iron bolt. A Southern Pacific Railroad bench mark. (1,276.787 meters or 4,188.925 feet.)

F 5.—About 1 mile south of **Chiloquin**, **Klamath County**, on the Southern Pacific Railroad, 10 feet west of and 3 feet below the level of the track, on the south abutment of the bridge over the **Sprague River**. A brass disk. (1,274.553 meters or 4,181.596 feet.)

Spur to Klamath Indian Agency

Z 5.—About $2\frac{1}{4}$ miles southeast of the **Klamath Indian Agency**, **Klamath County**, 65 feet northeast of a fork in the road which runs around a point of the hills to **Chiloquin** and $\frac{1}{4}$ mile west of **Mr. Jackson's house**. An iron pipe filled with concrete with disk in top. (1,294.995 meters or 4,248.663 feet.)

X 5 (U. S. G. S.).—At **Klamath Indian Agency**, **Klamath County**, in the stone foundation at the northeast corner of the water tower. An aluminum tablet stamped "4169 B 1908 B. S." (1,270.731 meters or 4,169.057 feet.)

W 5.—At **Klamath Indian Agency**, **Klamath County**, at the fork of a road leading into the **Indian agency grounds**, 200 feet south of the office building, 100 feet west of the county road, 35 feet from a fence and near a turn in it, between two lone pines. An iron pipe filled with concrete with disk in top. (1,273.023 meters or 4,176.576 feet.)

¹ As existing in 1904. The mileposts have since been relocated and moved approximately 1,200 feet nearer **Hunt**. That is, all bench marks described as being at the mile pole are about 1,200 feet south of it.

Y 5 (U. S. G. S.).—About $3\frac{1}{2}$ miles north of the **Klamath Indian Agency**, Klamath County, and $7\frac{1}{2}$ miles south of **Fort Klamath**, east of a road at a bend, 200 feet east of a creek, and 150 feet east of a house, in a large boulder. An aluminum tablet stamped "4157 B 1908 B. R." (1,267.117 meters or 4,157.200 feet.)

The bench marks in the following list, designated **KA 1**, etc., have not been described in detail. They are located in the vicinity of the **Klamath Indian Agency**, Klamath County, on the spur line from **Chiloquin**. The distances of these bench marks and of known points along the level route are given as aids to their recovery.

| Bench mark | Dis- tance, miles | Elevation | | Bench mark | Dis- tance, miles | Elevation | |
|-------------------|-------------------------|-----------|-----------|------------|-------------------------|-----------|-----------|
| | | Meters | Feet | | | Meters | Feet |
| Y 5 (U. S. G. S.) | 0.0 | 1,267.117 | 4,157.200 | Z 5 | 4.2 | 1,294.995 | 4,248.663 |
| KA 16 | 0.7 | 1,271.202 | 4,170.602 | KA 5 | 4.0 | 1,314.049 | 4,311.176 |
| KA 15 | 1.3 | 1,271.077 | 4,170.192 | KA 4 | 5.6 | 1,317.903 | 4,323.820 |
| W 5 | 1.9 | 1,273.023 | 4,176.576 | KA 3 | 6.0 | 1,302.140 | 4,272.104 |
| X 5 (U. S. G. S.) | 2.2 | 1,270.731 | 4,169.057 | KA 2 | 6.6 | 1,286.741 | 4,221.583 |
| KA 7 | 2.7 | 1,280.153 | 4,199.969 | KA 1 | 7.1 | 1,277.352 | 4,190.779 |
| KA 6 | 3.4 | 1,280.183 | 4,229.595 | F 5 | 7.8 | 1,274.553 | 4,181.606 |
| KA 8 | 4.1 | 1,294.879 | 4,248.282 | | | | |

End of spur.

M 5 (S. P.).—About $2\frac{1}{2}$ miles south of **Chiloquin**, Klamath County, on the Southern Pacific Railroad, 100 feet south of milepost 459, east of the track on culvert 458 B. A Southern Pacific Railroad bench mark consisting of a round-headed iron bolt. (1,267.473 meters or 4,158.368 feet.)

N 5 (S. P.).—About $\frac{1}{2}$ mile north of **Lobert**, Klamath County, on the Southern Pacific Railroad, on the northeast corner of culvert 457 A, over the Indian irrigation service canal. The top of a round-headed iron bolt; a Southern Pacific Railroad bench mark. (1,272.646 meters or 4,175.339 feet.)

O 5 (S. P.).—About $\frac{1}{2}$ mile south of **Lobert**, Klamath County, on the Southern Pacific Railroad, 650 feet north of milepost 456, on the northeast corner of culvert 456 A, over the Indian irrigation service canal. The top of a round-headed iron bolt; a Southern Pacific Railroad bench mark. (1,272.133 meters or 4,173.656 feet.)

E 5.—About $1\frac{1}{4}$ miles south of **Lobert**, Klamath County, on the Southern Pacific Railroad, 2,000 feet north of milepost 455, on the southwest corner of culvert 455 A. A brass disk. (1,271.713 meters or 4,172.278 feet.)

P 5 (S. P.).—About $2\frac{1}{4}$ miles south of **Lobert**, Klamath County, on the Southern Pacific Railroad, 1,300 feet north of milepost 454, on culvert 454 A. The top of a round-headed iron bolt; a Southern Pacific Railroad bench mark. (1,271.285 meters or 4,170.874 feet.)

Q 5 (S. P.).—About $\frac{1}{4}$ mile north of **Lelu**, Klamath County, on the Southern Pacific Railroad, on culvert 452 A. The top of a round-headed iron bolt; a Southern Pacific Railroad bench mark. (1,266.033 meters or 4,153.643 feet.)

D 5.—About $\frac{1}{4}$ mile south of **Lelu**, Klamath County, on the Southern Pacific Railroad, at milepost 452, 1,400 feet south of the north end of Modoc Point siding and 2,200 feet north of a county-road crossing, on the east side of culvert 451 D. A brass disk. (1,263.855 meters or 4,146.498 feet.)

Y 4.—About 350 feet south of **Ouxy**, Klamath County, on the Southern Pacific Railroad, 600 feet south of the north end of Ouxy siding, on the southeast corner of stone culvert 447 A, over a stream issuing from a spring. A brass disk. (1,265.330 meters or 4,151.337 feet.)

R 5 (S. P.).—About 1 mile south of **Ouxy**, Klamath County, on the Southern Pacific Railroad, about $\frac{1}{2}$ mile south of milepost 447, at the north end of a long fill across some swamp land, on the east side of the culvert 446 A. The top of a round-headed iron bolt; a Southern Pacific Railroad bench mark. (1,265.258 meters or 4,151.101 feet.)

V 4.—About $\frac{1}{2}$ mile north of **Algoma**, Klamath County, on the Southern Pacific Railroad, 400 feet north of the **Algoma Lumber Co. spur**, 1,180 feet

south of milepost 444, at the south end of a long fill across some swamp land, on the southwest corner of stone culvert 443 A. A brass disk. (1,265.321 meters or 4,151.307 feet.)

S 5 (S. P.).—About $\frac{3}{4}$ mile south of **Algoma**, Klamath County, on the Southern Pacific Railroad, $\frac{1}{2}$ mile south of the south end of **Algoma** siding, $\frac{1}{2}$ mile north of milepost 442, and 8 feet east of the track, on concrete culvert 442 A. The top of a round-headed iron bolt; a Southern Pacific Railroad bench mark. (1,264.357 meters or 4,148.145 feet.)

U 4.—About 2 miles north of **Wocus**, Klamath County, on the Southern Pacific Railroad, $\frac{1}{2}$ mile south of milepost 441, on the northwest corner of culvert 440 A. A brass disk. (1,264.209 meters or 4,147.659 feet.)

X 4.—About $\frac{3}{4}$ mile north of **Wocus**, Klamath County, on the Southern Pacific Railroad, 1,000 feet north of the north end of **Wocus** siding, $\frac{1}{2}$ mile north of milepost 439, about 5 feet below the level of the track, on the southwest corner of culvert 439 A. A brass disk. (1,264.363 meters or 4,148.164 feet.)

W 4.—About $\frac{3}{4}$ mile south of **Pelican City**, Klamath County, on the Southern Pacific Railroad, $\frac{1}{2}$ mile north of milepost 436, 15 feet east of the track, on the north side of culvert 436 A over a public road. A brass disk. (1,280.092 meters or 4,199.768 feet.)

T 4.—At **Klamath Falls**, Klamath County, in a granite block on the southeast corner of the Southern Pacific Railroad passenger depot, on the south face about 3 feet above the ground. A brass disk. (1,252.024 meters or 4,107.682 feet.)

Q 4.—At **Klamath Falls**, Klamath County, facing Main Street, on the southeast corner of the White Pelican Hotel, about 3 feet above the sidewalk. A brass disk. (1,253.380 meters or 4,112.131 feet.)

R 4.—At **Klamath Falls**, Klamath County, on the southwest corner of the First National Bank Building at the corner of Fourth and Main Streets, about 3 feet above the sidewalk on Main Street. A brass disk. (1,251.667 meters or 4,106.511 feet.)

U 5 (U. S. R. S.).—At **Klamath Falls**, Klamath County, in the western part of the town, 300 feet from the bridge across Link River, in the sidewalk on the north side of Main Street. An aluminum plate bench mark of the United States Reclamation Service. (1,251.722 meters or 4,106.691 feet.)

S 4.—At **Klamath Falls**, Klamath County, on Fifth Street, at the north side of the entrance to the city hall, in the vertical face of the concrete base of a lamp-post, about 3 feet above the sidewalk. A brass disk. (1,249.457 meters or 4,099.260 feet.)

For additional bench marks in the vicinity of Klamath Falls, see page 32.

Z 4.—About 1 mile north of **Texum**, Klamath County, on the Southern Pacific Railroad, $\frac{1}{4}$ mile south of milepost 432, in a concrete pier supporting the overhead crossing 431 F of a public road, 6 feet west of the track and under the north side of the road. A brass disk. (1,249.688 meters or 4,100.018 feet.)

A 5.—About $\frac{1}{2}$ mile south of **Texum**, Klamath County, on the Southern Pacific Railroad, $\frac{1}{4}$ mile north of milepost 430, on the northwest corner of culvert 430 B, over an irrigation canal. A brass disk. (1,247.001 meters or 4,091.202 feet.)

B 5.—At **Midland**, Klamath County, on the Southern Pacific Railroad, $\frac{1}{3}$ mile south of the depot, $\frac{1}{2}$ mile north of milepost 426, near the south end of the siding, and 30 feet east of the track, in the southwest concrete pier of the windmill tower. A brass disk. (1,247.097 meters or 4,091.517 feet.)

C 5.—About $\frac{3}{4}$ mile north of **Ady**, Klamath County, on the Southern Pacific Railroad, 100 feet north of the north end of the siding, $\frac{3}{4}$ mile south of milepost 424, 5 feet from the track, on the southeast corner of culvert 423 A, over the United States Reclamation Service canal. A brass disk. (1,246.997 meters or 4,091.189 feet.)

A 6 (S. P.).—About $\frac{3}{4}$ mile south of **Worden**, Klamath County, on the Southern Pacific Railroad, $\frac{1}{4}$ mile south of milepost 420, 75 feet south of the south end of Worden siding, on the concrete pier supporting a water tank on the side nearest the track. A round-headed iron bolt; a Southern Pacific Railroad bench mark. (1,259.373 meters or 4,131.793 feet.)

B 6 (S. P.).—About $\frac{1}{4}$ mile north of **Ivan**, Klamath County, on the Southern Pacific Railroad, 350 feet north of milepost 419, east of the track, on the

southeast corner of concrete culvert 419 A. The top of a round-headed iron bolt; a Southern Pacific Railroad bench mark. (1,262.522 meters or 4,142.124 feet.)

C 6 (S. P.).—About 650 feet north of **Ivan**, Klamath County, on the Southern Pacific Railroad, 600 feet north of the point of the Ivan spur, east of the track, on the southeast corner of concrete cattle pass 418 A. A bench mark of the Southern Pacific Railroad consisting of the top of a round-headed iron bolt. (1,265.256 meters or 4,151.094 feet.)

D 6 (S. P.).—About $\frac{1}{2}$ mile south of **Ivan**, Klamath County, on the Southern Pacific Railroad, 850 feet south of milepost 418, east of the track, on concrete cattle pass 417 E. A Southern Pacific Railroad bench mark consisting of a round-headed iron bolt. (1,269.102 meters or 4,163.712 feet.)

N 11 (S. P.).—About 1 mile south of **Calor**, Siskiyou County, Calif., on the Southern Pacific Railroad, $\frac{1}{2}$ mile north of the north end of tunnel 2, and $\frac{1}{2}$ mile north of milepost 415, east of the track, in the concrete undergrade crossing 415 B of a public road. A Southern Pacific Railroad bench mark consisting of a round-headed iron bolt. (1,281.346 meters or 4,203.883 feet.)

LINE IV, KLAMATH FALLS TO ONTARIO, OREG.

This line follows the highways from Klamath Falls through Olene, Dairy, Yainax, Beatty, Bly, Lakeview, Valley Falls, Alkali Lake, Butte, Egli, Gap Ranch, Oakerman Ranch, Burns, Lawen, and Saddle Butte to Crane, and thence the Oregon Short Line Railroad to Ontario, Oreg. The field work was done between May 17 and October 1, 1920, by Casper M. Durgin, junior hydrographic and geodetic engineer, assisted by F. W. Hough, junior hydrographic and geodetic engineer, who operated a subparty.

For additional bench marks at Klamath Falls, see page 31.

A 15.—About $4\frac{1}{2}$ miles east of **Klamath Falls**, Klamath County, and $1\frac{1}{2}$ miles east of a bridge over the irrigation canal, in the southwest corner of a field, about 800 feet south of the Klamath Falls-Lakeview Highway, 100 feet northwest of a house owned by Mrs. John A. Short, and 7 feet east of a road extending south from the highway. A concrete post with disk in top. (1,274.484 meters or 4,181.370 feet.) This bench mark is also a triangulation station on the California-Oregon arc.

B 15.—About $7\frac{1}{4}$ miles east of **Klamath Falls**, Klamath County, in the southeast corner of the schoolhouse lot, 330 feet southeast of the schoolhouse, and 7 feet north of the Klamath Falls-Lakeview highway. A concrete post with disk in top. (1,270.479 meters or 4,168.230 feet.)

C 15.—About $3\frac{3}{4}$ miles north of **Olene**, Klamath County, in the northeast corner of a field, at the intersection of the fence on the west side of the Klamath Falls-Lakeview highway and a fence south of a road branching from it and extending west to an old sawmill, and 80 feet northwest of a masonry culvert in the Klamath Falls-Lakeview highway about $\frac{3}{4}$ mile north of the point where this highway crosses the railroad track through an undergrade crossing. A concrete post with disk in top. (1,258.729 meters or 4,129.680 feet.)

D 15.—About $7\frac{1}{2}$ miles east of **Olene**, Klamath County, 50 feet south of the **Olene-Dairy** road, in the northeast corner of a field, in the angle formed by the intersection of a wire and a rail fence. A concrete post with disk in top. (1,275.816 meters or 4,185.740 feet.)

E 15.—At **Dairy**, Klamath County, 80 feet southeast of the house owned by **Alvy Beal** and occupied by **C. G. Anderson**. A concrete post with disk in top. (1,255.753 meters or 4,119.916 feet.)

J 15 (U. S. G. S.).—At **Dairy**, Klamath County, 650 feet east of the house owned by **Alvy Beal** and between a road and the fence on its north side. An iron pipe stamped "4122." (1,255.904 meters or 4,120.412 feet.)

F 15.—About $2\frac{1}{2}$ miles north of **Dairy**, Klamath County, 85 feet north of the blacksmith shop at the intersection of the **Dairy-Yainax** and **Dairy-Hilderbrand** roads, 2 feet inside of a wire fence on the east side of the **Dairy-Yainax** road. A concrete post with disk in top. (1,270.500 meters or 4,168.299 feet.)

G 15.—About $5\frac{1}{2}$ miles north of **Dairy**, Klamath County, in the southwest corner of the fence around two deserted houses, and 3 feet east of the Dairy-Yainax road, $\frac{1}{2}$ mile north of where it crosses the O. E. & N. E. Railway, now under construction. A concrete post with disk in top. (1,274.974 meters or 4,182.977 feet.)

H 15.—About 10 miles north of **Dairy**, Klamath County, $2\frac{3}{4}$ miles south of the south end of **Squaw Flat**, 7 feet west of the Dairy-Yainax road, in a fence corner at the point where the road crosses a small flat. A concrete post with disk in top. (1,291.123 meters or 4,235.959 feet.)

I 15.—About 14 miles north of **Dairy**, Klamath County, at the north end of **Squaw Flat**, in the fence line, six fence posts west of a gate across the Dairy-Yainax road. A concrete post with disk in top. (1,379.871 meters or 4,527.127 feet.)

K 15.—About $7\frac{1}{2}$ miles west of **Yainax**, Klamath County, 7 feet west of the Dairy-Yainax road at the south end of a ledge over which the road passes, 250 feet south of a gate across the road, and 100 feet northwest of a house, in bedrock. A brass disk. (1,324.873 meters or 4,346.687 feet.)

L 15.—About $6\frac{1}{2}$ miles west of **Yainax**, Klamath County, 15 feet north of the Dairy-Yainax road, in the northern part of the Mary Ann Copperfield ranch, in a fence corner near a gate, 820 feet east of the house owned by Dora Walker and occupied by Mrs. Pankey. A concrete post with disk in top. (1,311.510 meters or 4,302.846 feet.)

M 15.—About 3.1 miles west of **Yainax**, Klamath County, at the intersection of the fence along the Dairy-Yainax road and the fence around a corral on the north side of the road, $\frac{1}{2}$ mile west of a ranch house in the northwest quarter of sec. 13, T. 36 S., R. 10 E. A concrete post with disk in top. (1,316.192 meters or 4,318.207 feet.)

N 15.—At **Yainax**, Klamath County, in the southwest corner of the forest ranger's yard. A concrete post with disk in top. (1,324.657 meters or 4,345.979 feet.)

O 15.—About $2\frac{1}{2}$ miles east of **Yainax**, Klamath County, in the fence line, 130 feet north of the Yainax-Beatty (river) road where it passes through a fence. A concrete post with disk in top. (1,313.088 meters or 4,308.023 feet.)

P 15.—About $5\frac{1}{3}$ miles east of **Yainax**, Klamath County, at a church, just inside the fence on the south side of the Yainax-Beatty Road, 3 feet west of a gate, 165 feet east of Whisky Creek, and 60 feet west of the point where the road divides forming a right angle in the center of sec. 19, T. 36 S., R. 12 E. A concrete post with disk in top. (1,313.886 meters or 4,310.641 feet.)

Q 15.—About $2\frac{1}{3}$ miles west of **Beatty**, Klamath County, at the intersection of the fence along the Yainax-Beatty Road and the board fence around a ranch house, in a field, 10 feet north of the road and 80 feet southeast of the house. A concrete post with disk in top. (1,316.866 meters or 4,320.483 feet.)

R 15.—About $\frac{1}{4}$ mile east of **Beatty**, Klamath County, in the northeast corner of a field south of the road and near a gate. A concrete post with disk in top. (1,324.213 meters or 4,344.522 feet.)

S 15.—About $1\frac{1}{2}$ miles east of **Beatty**, Klamath County, 7 feet south of the Beatty-Bly Road, about 80 feet from the river at a point where the road makes a sharp bend, in bedrock, in the southwest quarter of sec. 13, T. 36 S., R. 12 E. A brass disk. (1,318.330 meters or 4,325.221 feet.)

T 15.—About $4\frac{1}{4}$ miles east of **Beatty**, Klamath County, in the corner of a wire fence on the north side of the Beatty-Bly Road, about 35 feet south of the Sprague River, just east of the point where the road circles around the side of a small hill. A concrete post with disk in top. (1,310.556 meters or 4,319.401 feet.)

U 15.—About $4\frac{3}{4}$ miles west of **Bly**, Klamath County, on the east side of the Bly-Silver Lake Road, on the ranch owned by Will Morgan, at the intersection of a wire and a rail fence. A concrete post with disk in top. (1,319.613 meters or 4,329.430 feet.)

V 15.—About $1\frac{1}{2}$ miles west of **Bly**, Klamath County, 10 feet north of the Beatty-Bly Road, on property owned by Mary H. Dixon, at the intersection of the fence along the road and the fence around a corral. A concrete post with disk in top. (1,324.755 meters or 4,346.300 feet.)

W 15.—At **Bly**, Klamath County, in the north face of the brick store owned by Mrs. M. L. Kilgore, near the front corner. A brass disk. (1,327.646 meters or 4,355.785 feet.)

X 15.—About $3\frac{1}{2}$ miles east of **Bly**, Klamath County, 50 feet southwest of James Bell's ranch house, in a fence corner north of the road and just outside

the front yard. A concrete post with disk in top. (1,332.448 meters or 4,371.540 feet.)

Y 15.—About $8\frac{1}{8}$ miles east of **Bly**, Klamath County, 15 feet south of the road, on the old Tull place now owned by Mr. Owen, just inside the corral fence which runs from near the house to the barn, at the point where the fence makes a small angle and is closest to the road. A concrete post with disk in top. (1,468.055 meters or 4,816.444 feet.)

Z 15.—About 10 miles east of **Bly**, Klamath County, in the northeast corner of the front yard of the Round Grove Ranch, owned by Mr. Owen. A concrete post with disk in top. (1,490.049 meters or 4,888.602 feet.)

A 16.—About $14\frac{1}{8}$ miles east of **Bly**, Klamath County, 25 feet north of the Bly-Lakeview road, at the highest point on the road, which point is the divide between the South Fork, Sprague River, and Drew Creek. A concrete post with disk in top. (1,678.832 meters or 5,507.968 feet.)

B 16.—About 17 miles east of **Bly**, Klamath County, just inside the fence, 50 feet north of the Bly-Lakeview road, at the sign "Quartz Valley" on a tree, and 25 feet east of a line running northward from a road culvert to a small cabin in the valley. A concrete post with disk in top. (1,617.068 meters or 5,305.331 feet.)

C 16.—About $20\frac{1}{4}$ miles east of **Bly**, Klamath County, 25 feet north of the Bly-Lakeview road, in the southeast corner of the front yard around a house owned by E. Smalley, whose ranch is the first one encountered in Drew Valley after leaving the Fremont National Forest. A concrete post with disk in top. (1,521.677 meters or 4,992.369 feet.)

D 16.—About 23 miles east of **Bly**, Klamath County, 15 feet north of the Bly-Lakeview road, about 500 feet east of the Smith & Perkins ranchhouse, at the east end of a rail fence. A concrete post with disk in top. (1,508.449 meters or 4,948.970 feet.)

E 16.—About $25\frac{1}{2}$ miles east of **Bly**, Klamath County, 25 feet north of the Bly-Lakeview road, 50 feet southeast of a schoolhouse, at a stile, in the corner formed by a board and a wire fence. A concrete post with disk in top. (1,503.543 meters or 4,932.874 feet.)

F 16.—About 28 miles east of **Bly**, Klamath County, 10 feet north of the Bly-Lakeview road, 50 feet southwest of a small deserted house, in the corner of a wire fence. A concrete post with disk in top. (1,507.102 meters or 4,944.550 feet.)

G 16.—About $30\frac{3}{4}$ miles east of **Bly**, Klamath County, 25 feet south of the Bly-Lakeview road, at the top of the divide between La Sieur Creek and Antelope Creek. A concrete post with disk in top. (1,617.800 meters or 5,307.762 feet.)

H 16.—About $12\frac{1}{2}$ miles west of **Lakeview**, Lake County, 35 feet south of the Bly-Lakeview road, at a curve, in a corner of a wire fence, near some big rocks on the Rice ranch. A concrete post with disk in top. (1,550.697 meters or 5,087.578 feet.)

I 16.—About 8.7 miles west of **Lakeview**, Lake County, 7 feet north of the Bly-Lakeview road, in a corner of a wire fence, on property owned by the Baldwin ranch. A concrete post with disk in top. (1,497.878 meters or 4,914.288 feet.)

J 16.—About 7 miles west of **Lakeview**, Lake County, 15 feet north of the Bly-Lakeview road, in a corner of a wire fence on property owned by the Baldwin ranch. A concrete post with disk in top. (1,464.976 meters or 4,806.342 feet.)

K 16.—About 5 miles west of **Lakeview**, Lake County, 10 feet south of the Bly-Lakeview road, in a corner of a wire fence, on property owned by M. Wohllaib. A concrete post with disk in top. (1,464.187 meters or 4,803.753 feet.)

L 16.—About 4 miles west of **Lakeview**, Lake County, 15 feet south of the Bly-Lakeview road, in the northwest corner of the wire fence around a field owned by Walter Lechmann. A concrete post with disk in top. (1,444.956 meters or 4,740.660 feet.)

M 16.—About $1\frac{1}{4}$ miles west of **Lakeview**, Lake County, $\frac{3}{4}$ mile west of the junction between the Bly-Lakeview and the Lakeview-Paisley roads, 10 feet south of the Bly-Lakeview road, in a fence line. A concrete post with disk in top. (1,442.991 meters or 4,734.213 feet.) This bench mark is also a triangulation station on the California-Oregon arc.

N 16.—At **Lakeview**, Lake County, in the south face of the Lakeview Hotel. A brass disk. (1,463.361 meters or 4,801.043 feet.)

O 16.—At **Lakeview**, Lake County, in the south face of the Odd Fellows Building. A brass disk. (1,461.530 meters or 4,795.036 feet.)

P 16.—At **Lakeview**, Lake County, in the north face of the courthouse, near the northeast corner. A brass disk. (1,462.949 meters or 4,799.692 feet.)

Q 16 (R. R. B. M.).—At **Lakeview**, Lake County, the top of the south balustrade of the west entrance to the courthouse. A Nevada-California-Oregon Railway bench mark. (1,462.377 meters or 4,797.815 feet.)

R 16.—About $3\frac{3}{4}$ miles north of **Lakeview**, Lake County, 25 feet east of the Lakeview-Valley Falls road, 165 feet west of a small house which has two small barns very close to it, in the southeast corner of a wire fence. A concrete post with disk in top. (1,489.377 meters or 4,886.398 feet.)

S 16.—About $6\frac{1}{4}$ miles north of **Lakeview**, Lake County, 35 feet east of the Lakeview-Valley Falls road, and 35 feet southwest of the Wilcox ranch house, in a corner of a wire fence. A concrete post with disk in top. (1,514.231 meters or 4,967.939 feet.)

T 16.—About $9\frac{1}{4}$ miles north of **Lakeview**, Lake County, 15 feet east of the Lakeview-Valley Falls road, in the southwest corner of a rail fence, on property owned by L. C. Meyer. A concrete post with disk in top. (1,505.375 meters or 4,938.884 feet.)

U 16.—About 12 miles north of **Lakeview**, Lake County, in the top of the west end of a concrete culvert on the Lakeview-Valley Falls road, 80 feet north of a right-angled turn in the road. A concrete post with disk in top. (1,433.485 meters or 4,703.025 feet.)

W 16.—About $14\frac{1}{2}$ miles north of **Lakeview**, Lake County, 15 feet east of the Lakeview-Valley Falls road, $\frac{1}{4}$ mile east of the ranch house of A. M. Stephenson, in the line of a wire fence, 15 feet east of the point where the wire fence and a rail fence form a corner. A concrete post with disk in top. (1,396.201 meters or 4,580.703 feet.)

X 16.—About $17\frac{1}{2}$ miles north of **Lakeview**, Lake County, on the Lakeview-Valley Falls road, in the top of the northwest abutment of the bridge over Grooms Creek. A brass disk. (1,372.047 meters or 4,501.457 feet.)

Y 16.—About 5 miles south of **Valley Falls**, Lake County, in the southwest corner of the fence around the S. B. Chandler ranch house. A concrete post with disk in top. (1,352.307 meters or 4,436.694 feet.)

Z 16.—About $2\frac{1}{2}$ miles south of **Valley Falls**, Lake County, east of the Lakeview-Valley Falls road, in a corner of a wire fence, on property owned by H. L. Chandler. A concrete post with disk in top. (1,321.365 meters or 4,335.178 feet.)

A 17.—At **Valley Falls**, Lake County, 460 feet west of the Valley Falls post office, in the northwest corner of a wire fence, on property owned by C. W. E. Jennings. A concrete post with disk in top. (1,313.372 meters or 4,308.955 feet.)

B 17.—About $1\frac{3}{4}$ miles north of **Valley Falls**, Lake County, 20 feet west of the Valley Falls-Butte road, opposite the ranch occupied by Mr. Hotchkiss, and 65 feet south of the driveway south of the barn. A concrete post with disk in top. (1,304.241 meters or 4,278.997 feet.)

C 17.—About $4\frac{1}{2}$ miles north of **Valley Falls**, Lake County, 165 feet east of the Valley Falls-Butte road, and $2\frac{3}{4}$ miles north of the Hotchkiss ranch, on the west shore line of Lake Abert, 20 feet west of the high-water line, in bedrock, at a point indicated by a small cairn. A brass disk. (1,297.417 meters or 4,256.609 feet.)

D 17.—About $7\frac{1}{2}$ miles north of **Valley Falls**, Lake County, 250 feet east of the Valley Falls-Butte road, and $5\frac{3}{4}$ miles north of the Hotchkiss ranch, on the west shore line of Lake Abert, in bedrock at a point indicated by a small cairn. A brass disk. (1,297.687 meters or 4,257.495 feet.)

E 17.—About $9\frac{1}{2}$ miles north of **Valley Falls**, Lake County, 100 feet east of the Valley Falls-Butte road, and $7\frac{3}{4}$ miles north of the Hotchkiss ranch, on the west shore line of Lake Abert, 80 feet west of a spring, in bedrock at a point indicated by a small cairn. A brass disk. (1,299.337 meters or 4,262.908 feet.)

F 17.—About 12 miles north of **Valley Falls**, Lake County, 650 feet east of the Valley Falls-Butte road, $\frac{1}{4}$ mile north of a spring, and $10\frac{1}{4}$ miles north of Hotchkiss ranch on the west shore of Lake Abert, in bedrock. (1,297.713 meters or 4,257.580 feet.)

G 17.—About $14\frac{1}{2}$ miles north of **Valley Falls**, Lake County, 10 feet east of the Valley Falls-Butte road, and about 500 feet southwest of a small cabin and

corral, in a corner of a wire fence. A concrete post with disk in top. (1,303.098 meters or 4,275.247 feet.)

H 17.—About 17 miles north of Valley Falls, Lake County, 250 feet east of the Valley Falls-Butte road, on the west shore line of Lake Abert, in line of a barbed-wire fence on property owned by the Brattain ranch. A concrete post with disk in top. (1,299.988 meters or 4,265.044 feet.)

I 17.—About 19½ miles north of Valley Falls, Lake County, 3 feet east of the Valley Falls-Butte road in a corner of a wire fence, on property owned by the Chandler X. L. ranch, and 2¼ miles to the south of it. A concrete post with disk in top. (1,304.745 meters or 4,280.651 feet.)

J 17.—About 22¼ miles north of Valley Falls, Lake County, 325 feet west of Chandler X. L. ranch house, 55 feet west of the gate to the house, on the south side of the road which turns into the ranch from the Valley Falls-Butte road, in a corner of the wire fence. A concrete post with disk in top. (1,305.732 meters or 4,283.889 feet.)

K 17.—About 25½ miles north of Valley Falls, Lake County, 15 feet west of the Valley Falls-Butte road and 2½ miles north of the Chandler X. L. ranch, at a point indicated by a small cairn. A concrete post with disk in top. (1,367.872 meters or 4,487.760 feet.)

L 17.—About 28 miles north of Valley Falls, Lake County, 15 feet east of the Valley Falls-Butte road, and 5 miles north of the Chandler X. L. ranch, on top of a ridge at a point indicated by a small cairn. A concrete post with disk in top. (1,447.159 meters or 4,747.887 feet.)

M 17.—About 30½ miles north of Valley Falls, Lake County, 15 feet east of the Valley Falls-Butte road, and 7¾ miles north of the Chandler X. L. ranch, at a point indicated by a small cairn. A concrete post with disk in top. (1,457.428 meters or 4,781.578 feet.)

N 17.—About 32¼ miles north of Valley Falls, Lake County, 15 feet west of the Valley Falls-Butte road and 10 miles north of the Chandler X. L. ranch, at a point indicated by a small cairn. A concrete post with disk in top. (1,413.855 meters or 4,638.623 feet.)

V 16.—About 35 miles north of Valley Falls, Lake County, 20 feet west of the Valley Falls-Butte road and 4½ miles south of the American Soda Products Co. office at Alkali Lake, at a point indicated by a small cairn. A concrete post with disk in top. (1,400.324 meters or 4,594.230 feet.)

O 17.—About 22¾ miles south of Butte, Lake County, 15 feet west of the Valley Falls-Butte road and 2½ miles south of the American Soda Products Co. office at Alkali Lake, at a point indicated by a small cairn. A concrete post with disk in top. (1,354.721 meters or 4,444.614 feet.)

P 17.—About 20 miles south of Butte, Lake County, 7 feet west of the Valley Falls-Butte road and 7 feet southeast of the southeast corner of the American Soda Products Co. office building at Alkali Lake, on property owned by the company, in the corner of a wire fence. A concrete post with disk in top. (1,311.872 meters or 4,304.033 feet.)

Q 17.—About 17½ miles south of Butte, Lake County, 80 feet east of the Valley Falls-Butte road, 130 feet west of a cabin on property owned by Link Hutton, and 10 feet north of a gate, in the line of a wire fence. A concrete post with disk in top. (1,300.647 meters or 4,267.206 feet.)

R 17.—About 15 miles south of Butte, Lake County, 20 feet east of the Valley Falls-Butte road and 5 miles north of the American Soda Products Co. office at Alkali Lake, 50 feet south of where the road cuts through a sand ridge, at a point indicated by a small cairn. A concrete post with disk in top. (1,344.541 meters or 4,411.215 feet.)

S 17.—About 12½ miles south of Butte, Lake County, 15 feet west of the Valley Falls-Butte road, at a point indicated by a small cairn. A concrete post with disk in top. (1,314.590 meters or 4,312.951 feet.)

T 17.—About 10 miles south of Butte, Lake County, 65 feet west of the Valley Falls-Butte road, 80 feet southwest of a cabin, in the southeast corner of the wire fence around a corral. A concrete post with disk in top. (1,314.591 meters or 4,312.954 feet.)

U 17.—About 7½ miles south of Butte, Lake County, 15 feet east of the Valley Falls-Butte road, at a point indicated by a small cairn. A concrete post with disk in top. (1,319.395 meters or 4,328.715 feet.)

V 17.—About 5 miles south of Butte, Lake County, 15 feet east of the Valley Falls-Butte road, at a point indicated by a small cairn. A concrete post with disk in top. (1,324.239 meters or 4,344.607 feet.)

W 17.—About $2\frac{1}{2}$ miles south of **Butte**, Lake County, 15 feet west of the Valley Falls-Butte road, at a point indicated by a small cairn. A concrete post with disk in top. (1,321.605 meters or 4,335.966 feet.)

Y 17.—About 3 miles east of **Butte**, Lake County, 35 feet west of the center of the Butte-Burns road at the entrance to the gap at the point where the road crosses a creek bed, in bedrock at a point indicated by a small cairn. A brass disk. (1,358.384 meters or 4,456.631 feet.)

Z 17.—About $5\frac{1}{2}$ miles east of **Butte**, Lake County, 25 feet west of the center of the Butte-Burns road, about 165 feet east of the point where the road crosses a ledge of rock. A concrete post with disk in top. (1,422.497 meters or 4,666.976 feet.)

X 17.—At **Wagontire**, Harney County, 65 feet south of the Butte-Burns road, $\frac{1}{4}$ mile east of the post office, in a fence corner. A concrete post with disk in top. (1,462.210 meters or 4,797.267 feet.)

A 18.—About $16\frac{3}{4}$ miles west of **Gap Ranch**, Harney County, on the south side of the Gap Ranch-Lakeview road, about $\frac{1}{2}$ mile north of Link Hutton's house, in a fence corner at the top of a short steep hill. A concrete post with disk in top. (1,509.825 meters or 4,953.484 feet.)

B 18.—About $13\frac{1}{2}$ miles west of **Gap Ranch**, Harney County, north of the Gap Ranch-Lakeview road at a point where it makes a right angle, in a fence corner. A concrete post with disk in top. (1,485.248 meters or 4,872.851 feet.)

C 18.—About 11 miles west of **Gap Ranch**, Harney County, and $1\frac{1}{2}$ miles north of Egl south of the Gap Ranch-Lakeview road, in a fence corner. A concrete post with disk in top. (1,455.599 meters or 4,775.578 feet.)

D 18.—About $7\frac{3}{4}$ miles west of **Gap Ranch**, Harney County, 15 feet north of the center of the Gap Ranch-Lakeview road, near a mail box, at a point indicated by a pile of rocks. A concrete post with disk in top. (1,451.426 meters or 4,761.887 feet.)

E 18.—About $5\frac{1}{2}$ miles west of **Gap Ranch**, Harney County, 15 feet south of the Gap Ranch-Lakeview road, at a point indicated by a pile of rocks. A concrete post with disk in top. (1,397.324 meters or 4,584.387 feet.)

F 18.—About $2\frac{3}{4}$ miles west of **Gap Ranch**, Harney County, 25 feet south of the Gap Ranch-Lakeview road, near a lone juniper tree, at a point indicated by a pile of rocks. A concrete post with disk in top. (1,411.826 meters or 4,631.966 feet.)

G 18.—About $\frac{1}{3}$ mile west of **Gap Ranch**, Harney County, in the acute angle formed by the Gap Ranch-Lakeview and Gap Ranch-Bend roads. A concrete post with disk in top. (1,358.881 meters or 4,458.262 feet.)

H 18.—At **Gap Ranch**, Harney County, in the fence line in front of the ranch house. A concrete post with disk in top. (1,341.756 meters or 4,402.078 feet.)

For additional bench marks in the vicinity of **Gap Ranch**, see page 42.

I 18.—About 3 miles east of **Gap Ranch**, Harney County, 7 feet north of the Gap Ranch-Burns road and $\frac{1}{4}$ mile northeast of a house owned by George Felers, in the line of a wire fence. A concrete post with disk in top. (1,326.784 meters or 4,352.957 feet.)

J 18.—About 6 miles east of **Gap Ranch**, Harney County, 5 feet south of the Gap Ranch-Burns (direct) road, in front of a cabin owned by Preston DeWitt. A concrete post with disk in top. (1,322.605 meters or 4,339.247 feet.)

K 18.—About $8\frac{3}{4}$ miles east of **Gap Ranch**, Harney County, south of the fence and 10 feet south of the Gap Ranch-Burns (direct) road, about 250 feet northeast of the ranch house of D. G. Cooper, and 60 feet north of his barn, in a fence corner. A concrete post with disk in top. (1,309.216 meters or 4,295.319 feet.)

L 18.—About $3\frac{1}{4}$ miles west of **Oakerman Ranch**, Harney County, 5 feet north of the Gap Ranch-Burns (direct) road, and 5 feet southwest of the ranch house owned by Frank Dibble, in the corner of a wire fence. A concrete post with disk in top. (1,291.477 meters or 4,237.121 feet.)

S 18 (U. S. G. S.).—At **Oakerman Ranch**, Harney County, opposite the old Riley post office, at the fence in front of Fred Oakerman's house. An iron post stamped "4210 H." (1,285.730 meters or 4,218.266 feet.)

M 18.—About 3 miles east of **Oakerman Ranch**, Harney County, 25 feet north of the Bend-Burns road in the line of an old wire fence about 1,000 feet west of a corner, at a point indicated by a pile of rocks. A concrete post with disk in top. (1,332.508 meters or 4,371.737 feet.)

N 18.—About 6 miles east of **Oakerman Ranch**, Harney County, 15 feet north of the Bend-Burns road, at a point indicated by a small cairn. A concrete post with disk in top. (1,354.113 meters or 4,442.619 feet.)

O 18.—About 9 miles east of **Oakerman Ranch**, Harney County, in the west acute angle formed by the new and the old Bend-Burns roads, and east of the line of poles of the old road, at a point indicated by a cairn. A concrete post with disk in top. (1,390.877 meters or 4,563.236 feet.)

T 18 (U. S. G. S.).—About 16 miles west of **Burns**, Harney County, 15 feet south of the old and 20 feet north of the new Bend-Burns road, in a canyon. An iron post stamped "4404 H." (1,344.843 meters or 4,412.206 feet.)

P 18.—About 15½ miles west of **Burns**, Harney County, 15 feet south of the Bend-Burns road, at the point where it is crossed by the telephone wires, at the foot of a canyon. A concrete post with disk in top. (1,319.873 meters or 4,330.283 feet.)

U 18 (U. S. G. S.).—About 12.9 miles west of **Burns**, Harney County, on the south margin of the Bend-Burns road, at the fence line, 4 feet west of the gate leading to Calkins ranch house. An iron post stamped "4195 H." (1,281.096 meters or 4,203.062 feet.)

Q 18.—About 12¾ miles west of **Burns**, Harney County, 25 feet south of the Bend-Burns road, and ¼ mile east of the gate leading to the Calkins ranch. A concrete post with disk in top. (1,282.359 meters or 4,207.206 feet.)

R 18.—About 10 miles west of **Burns**, Harney County, on the north side of the Bend-Burns road, 1 mile west of Jenkin's ranch, in a fence corner. A concrete post with disk in top. (1,266.865 meters or 4,156.373 feet.)

A 19 (U. S. G. S.).—About 8.9 miles west of **Burns**, Harney County, on the north side of the Bend-Burns Road, at the fence line, and 50 feet west of Jenkin's ranch house. An iron post stamped "4138 H." (1,263.818 meters or 4,146.376 feet.)

B 19 (U. S. G. S.).—About 6.2 miles west of **Burns**, Harney County, on the Bend-Burns road at the point where it leaves the valley and goes over the hill, in a fence corner. An iron post stamped "4160 H." (1,270.439 meters or 4,168.099 feet.)

V 18.—About 4½ miles south of **Burns**, Harney County, east of the Bend-Burns Road, at a large spring, in a fence corner. A concrete post with disk in top. (1,262.593 meters or 4,142.357 feet.)

W 18.—About 1½ miles south of **Burns**, Harney County, south of the Bend-Burns Road, in a fence corner. A concrete post with disk in top. (1,275.226 meters or 4,183.804 feet.)

C 19.—At **Burns**, Harney County, 165 feet south of the south end of the main street, at the southeast corner of an old barn and on the east side of a fence running south on the property of C. H. Voegtly. A concrete post with disk in top. (1,264.396 meters or 4,148.273 feet.) This bench mark is also a triangulation station on the California-Oregon arc.

D 19 (U. S. G. S.).—At **Burns**, Harney County, in the front yard of the county courthouse, 10 feet from the fence and 4 feet north of the walk leading to the building. An iron post stamped "4177 H." (1,275.810 meters or 4,185.720 feet.)

X 18.—At **Burns**, Harney County, in the south wall of the Times-Herald Building, near the southeast corner. A brass disk. (1,267.840 meters or 4,159.572 feet.)

Y 18.—At **Burns**, Harney County, in the south wall of Voegtly's hardware store. A brass disk. (1,266.470 meters or 4,155.077 feet.)

Z 18.—At **Burns**, Harney County, in the high-school building, in the concrete floor at the northwest corner of the east entrance. A brass disk. (1,288.088 meters or 4,226.002 feet.)

For additional bench marks in the vicinity of Burns, see page 15.

E 19.—About 2¾ miles east of **Burns**, Harney County, 25 feet north of the center of the Burns-Lawen Road, 650 feet south of George Whiting's ranch house, in the fence line 3 feet east of a large gate. A concrete post with disk in top. (1,262.945 meters or 4,143.512 feet.)

F 19.—About 5¼ miles east of **Burns**, Harney County, 15 feet south of the center of the new Burns-Crane Highway, on property owned by the Cordon ranch, in a corner of the wire fence. A concrete post with disk in top. (1,260.864 meters or 4,136.685 feet.)

G 19.—About 8 miles east of **Burns**, Harney County, 15 feet south of the new Burns-Crane Highway at a point where the old Burns-Crane Highway makes a

crossing, in a corner of wire fence. A concrete post with disk in top. (1,259.401 meters or 4,131.885 feet.)

H 19.—About 10¾ miles east of **Burns**, Harney County, 15 feet south of the new Burns-Crane Highway, at a point where the old Burns-Crane Highway makes a crossing, in a corner of the wire fence. A concrete post with disk in top. (1,257.106 meters or 4,124.552 feet.)

I 19.—About 13 miles east of **Burns**, Harney County, 15 feet south of the new Burns-Crane Highway, in a corner of the wire fence. A concrete post with disk in top. (1,254.046 meters or 4,114.316 feet.)

J 19.—About 15 miles east of **Burns**, Harney County, in the southeast angle of the intersection of the new Burns-Crane Highway with the old Burns-Lawen Road. A concrete post with disk in top. (1,252.851 meters or 4,110.395 feet.)

K 19.—About 17¾ miles east of **Burns**, Harney County, 15 feet north of the Burns-Lawen Road, and 115 feet southwest of a cabin on property owned by Bill Catterson, in a corner of a wire fence. A concrete post with disk in top. (1,249.904 meters or 4,100.924 feet.)

L 19.—About 2 miles east of **Lawen**, Harney County, 15 feet north of the Lawen-Saddle Butte Road, on property owned by Blanche Sitz, in a corner of the wire fence. A concrete post with disk in top. (1,249.225 meters or 4,098.499 feet.)

M 19.—About 4¾ miles east of **Lawen**, Harney County, 15 feet north of the Lawen-Saddle Butte Road and about 130 feet southeast of a cabin, in a corner of the wire fence. A concrete post with disk in top. (1,250.445 meters or 4,102.502 feet.)

N 19.—About ¼ mile east of **Saddle Butte**, Harney County, 15 feet south of the Lawen-Saddle Butte Road and 65 feet north of a cabin owned by the Auburn Town Site Co., in a corner of the wire fence. A concrete post with disk in top. (1,249.849 meters or 4,100.546 feet.)

O 19.—About 3½ miles east of **Saddle Butte**, Harney County, 15 feet south of the Saddle Butte-Crane Road and 65 feet northwest of a small house, in a corner of the wire fence. A concrete post with disk in top. (1,252.630 meters or 4,109.670 feet.)

P 19.—At **Crane**, Harney County, in the west face of the Crane High School. A brass disk. (1,260.708 meters or 4,136.370 feet.)

Q 19.—At **Crane**, Harney County, on the south face of the First State Bank Building, in the southeast corner. A brass disk. (1,259.453 meters or 4,132.055 feet.)

R 19.—At **Crane**, Harney County, in the east face of the Crane Mercantile Co. building. A brass disk. (1,259.321 meters or 4,131.622 feet.)

S 19.—About 3 miles east of **Crane**, Harney County, on the Oregon Short Line Railroad, opposite culvert 124.75, and 35 feet north of the track. A concrete post with disk in top. (1,264.725 meters or 4,149.352 feet.)

T 19.—About 6¼ miles east of **Crane**, Harney County, on the Oregon Short Line Railroad, halfway between the ninth and tenth telegraph poles east of milepost 121, and 15 feet north of the track. A concrete post with disk in top. (1,219.250 meters or 4,000.156 feet.)

U 19.—About 8½ miles east of **Crane**, Harney County, on the Oregon Short Line Railroad at milepost 118. A concrete post with disk in top. (1,183.731 meters or 3,883.024 feet.)

V 19.—About 11½ miles east of **Crane**, Harney County, on the Oregon Short Line Railroad, at milepost 115, north of the track. A concrete post with disk in top. (1,163.302 meters or 3,816.600 feet.)

W 19.—About 14½ miles east of **Crane**, Harney County, on the Oregon Short Line Railroad, at milepost 112, north of the track. A concrete post with disk in top. (1,154.883 meters or 3,788.979 feet.)

X 19.—About 17½ miles east of **Crane**, Harney County, on the Oregon Short Line Railroad, at milepost 109, north of the track. A concrete post with disk in top. (1,135.548 meters or 3,725.544 feet.)

Y 19.—About 19¼ miles east of **Crane**, Harney County, on the Oregon Short Line Railroad, at milepost 107, in the southwest corner of the bridge over South Fork Malheur River. A square cut. (1,110.433 meters or 3,643.146 feet.)

Z 19.—About 20½ miles east of **Crane**, Harney County, on the Oregon Short Line Railroad, at milepost 106, north of the track. A concrete post with disk in top. (1,095.936 meters or 3,595.583 feet.)

A 20.—About 23½ miles east of **Crane**, Harney County, on the Oregon Short Line Railroad, at milepost 103, north of the track. A concrete post with disk in top. (1,051.985 meters or 3,451.387 feet.)

B 20.—About 26½ miles east of **Crane**, Harney County, on the Oregon Short Line Railroad, halfway between the second and third telegraph poles west of milepost 100, north of the track. (1,036.398 meters or 3,400.249 feet.)

C 20.—About 2 miles west of **Riverside**, Malheur County, on the Oregon Short Line Railroad, halfway between the first and second telegraph poles east of milepost 95, north of the track. A concrete post with disk in top. (1,018.406 meters or 3,341.220 feet.)

D 20.—About ½ mile west of **Riverside**, Malheur County, on the Oregon Short Line Railroad, at a road crossing, south of the track in a fence corner. A concrete post with disk in top. (1,015.313 meters or 3,331.073 feet.)

E 20.—About 1½ miles east of **Riverside**, Malheur County, on the Oregon Short Line Railroad, south of the track, in the west abutment of bridge 91.49. A brass disk. (1,004.458 meters or 3,295.459 feet.)

F 20.—About 4½ miles east of **Riverside**, Malheur County, on the Oregon Short Line Railroad, south of the track, in the east abutment of bridge 88.52. A brass disk. (973.225 meters or 3,192.989 feet.)

G 20.—About 8 miles east of **Riverside**, Malheur County, on the Oregon Short Line Railroad, south of the track, in the west abutment of bridge 84.99. A brass disk. (953.592 meters or 3,128.576 feet.)

H 20.—About 9¼ miles west of **Juntura**, Malheur County, on the Oregon Short Line Railroad, south of the track, in the east abutment of bridge 83.79. A square cut lettered "U. S. B. S." (945.412 meters or 3,101.739 feet.)

J 20.—About 6½ miles west of **Juntura**, Malheur County, on the Oregon Short Line Railroad, a short distance west of milepost 80, north of the track. A concrete post with disk in top. (921.704 meters or 3,023.957 feet.)

I 20.—About 3 miles west of **Juntura**, Malheur County, on the Oregon Short Line Railroad, south of the track, in the east abutment of bridge 78.66. A brass disk. (909.716 meters or 2,984.627 feet.)

K 20.—At **Juntura**, Malheur County, on the Oregon Short Line Railroad, four telegraph poles west of the depot, north of the track. A concrete post with disk in top. (900.146 meters or 2,953.220 feet.)

Q 20.—At **Juntura**, Malheur County, on the south face of the high school, halfway between the front door and the southeast corner, 3 feet above the ground. A brass disk. (907.899 meters or 2,978.665 feet.)

L 20.—About 2½ miles east of **Juntura**, Malheur County, on the Oregon Short Line Railroad, south of the track, in the east abutment of the first bridge over the Malheur River east of a small tunnel. A brass disk. (891.913 meters or 2,926.218 feet.)

M 20.—At **Gwinn**, Malheur County, on the Oregon Short Line Railroad, 3 feet south of the station sign. A concrete post with disk in top. (878.038 meters or 2,880.696 feet.)

N 20.—At **Peach**, Malheur County, on the Oregon Short Line Railroad, 35 feet west of the station sign and 35 feet south of the track. A concrete post with disk in top. (864.687 meters or 2,836.894 feet.)

O 20.—About 3 miles east of **Peach**, Malheur County, on the Oregon Short Line Railroad, north of the track, on the west abutment of bridge 61.76. A square cut. (853.635 meters or 2,800.634 feet.)

P 20.—About 1½ miles west of **Bohna**, Malheur County, on the Oregon Short Line Railroad, south of the track, in the south abutment of culvert 57.87. A square cut. (838.968 meters or 2,752.514 feet.)

R 20.—At **Bohna**, Malheur County, on the Oregon Short Line Railroad, opposite the station sign, in the fence line south of the track. A concrete post with disk in top. (831.141 meters or 2,726.835 feet.)

S 20.—At **Namorff**, Malheur County, on the Oregon Short Line Railroad, between the station sign and the water tank, east of a road crossing and north of the track. A concrete post with disk in top. (802.107 meters or 2,631.875 feet.)

T 20.—At **Kime**, Malheur County, on the Oregon Short Line Railroad, at a gate opposite the station signboard and north of the track. A concrete post with disk in top. (788.593 meters or 2,587.242 feet.)

U 20.—About 3 miles west of **Harper**, Malheur County, on the Oregon Short Line Railroad, three telegraph poles east of milepost 45, north of the track. A concrete post with disk in top. (781.285 meters or 2,563.266 feet.)

V 20.—At **Harper**, Malheur County, on the Oregon Short Line Railroad, opposite the depot and south of the track. A concrete post with disk in top. (766.586 meters or 2,515.041 feet.)

W 20.—About $1\frac{1}{2}$ miles east of **Harper**, Malheur County, on the Oregon Short Line Railroad, north of the track in an abutment of culvert 40.44. A square cut. (762.477 meters or 2,501.560 feet.)

X 20.—About $3\frac{3}{4}$ miles east of **Harper**, Malheur County, on the Oregon Short Line Railroad, 50 feet east of the track, in a fence corner. A concrete post with disk in top. (753.326 meters or 2,471.537 feet.)

Y 20.—At **Little Valley**, Malheur County, on the Oregon Short Line Railroad, 50 feet east of the water tank and 35 feet south of the track. A concrete post with disk in top. (742.842 meters or 2,437.141 feet.)

Z 20.—About $4\frac{3}{4}$ miles east of **Little Valley**, Malheur County, on the Oregon Short Line Railroad, 7 feet south of the track, in an abutment of culvert 39.96. A square cut. (738.503 meters or 2,422.905 feet.)

A 21 (U. S. G. S.).—About 8 miles west of **Hope**, Malheur County, and 16 miles west of **Vale**, on the Oregon Short Line Railroad, north of the track in a borrow pit. An iron post stamped "2384 H." (729.399 meters or 2,392.938 feet.)

B 21.—About 6 miles west of **Hope**, Malheur County, on the Oregon Short Line Railroad, in the southeast corner of bridge 3 over Malheur River. A square cut. (729.445 meters or 2,393.187 feet.)

C 21.—About $3\frac{1}{4}$ miles west of **Hope**, Malheur County, on the Oregon Short Line Railroad, in the south abutment of culvert 127.07. A square cut. (717.456 meters or 2,353.854 feet.)

D 21 (U. S. G. S.).—About $2\frac{1}{2}$ miles west of **Hope**, Malheur County, and 10.6 miles west of **Vale**, on Louis Paddock's ranch, 50 feet east of the house, and at the south margin of the road. An iron post stamped "2334 H." (714.092 meters or 2,342.817 feet.)

E 21.—At **Hope**, Malheur County, on the Oregon Short Line Railroad, opposite the station signboard and north of the track in the fence line. A concrete post with disk in top. (707.236 meters or 2,320.323 feet.)

F 21.—About $4\frac{1}{4}$ miles west of **Vale**, Malheur County, on the Oregon Short Line Railroad, north of the track, in a culvert. A square cut. (699.680 meters or 2,295.533 feet.)

G 21.—About $1\frac{1}{4}$ miles west of **Vale**, Malheur County, on the Oregon Short Line Railroad, north of the track, on the first culvert west of the bridge over Bully Creek. A square cut. (691.196 meters or 2,267.099 feet.)

H 21.—At **Vale**, Malheur County, on the Oregon Short Line Railroad, south of the track in culvert 15.78. A brass disk. (684.290 meters or 2,245.041 feet.)

I 21.—At **Vale**, Malheur County, in the west face of the Nordale Furniture Co. building. A brass disk. (684.091 meters or 2,244.389 feet.)

U 21.—At **Vale**, Malheur County, in the west face of the Vale Trading Co. building. A brass disk. (684.326 meters or 2,245.160 feet.)

For additional bench marks in the vicinity of **Vale**, see page 13.

J 21.—About $1\frac{1}{2}$ miles east of **Vale**, Malheur County, on the Oregon Short Line Railroad, opposite milepost 14, south of the track. A concrete post with disk in top. (680.348 meters or 2,232.108 feet.)

K 21.—About 5 miles east of **Vale**, Malheur County, and 1 mile west of **Mallett**, on the Oregon Short Line Railroad, 25 feet west of the Vale-Ontario highway, in a fence corner north of the track. A concrete post with disk in top. (673.141 meters or 2,208.463 feet.)

L 21.—About $7\frac{3}{4}$ miles west of **Ontario**, Malheur County, and $2\frac{3}{4}$ miles west of **Luse**, on the Oregon Short Line Railroad, north of the track, in a fence corner 10 feet east of a gate. A concrete post with disk in top. (668.832 meters or 2,194.326 feet.)

M 21.—About 6 miles west of **Ontario**, Malheur County, and 1 mile west of **Luse**, on the Oregon Short Line Railroad, 65 feet west of milepost 6, in the fence line north of the track. (671.617 meters or 2,203.463 feet.)

N 21.—About 4 miles west of **Ontario**, Malheur County, near **Cairo**, on the Oregon Short Line Railroad, directly opposite E. L. Springer's ranch house, and 25 feet north of the track. A concrete post with disk in top. (670.147 meters or 2,198.641 feet.)

O 21.—About $2\frac{1}{2}$ miles west of **Ontario**, Malheur County, and $\frac{1}{2}$ mile west of **Malheur Junction**, on the Oregon Short Line Railroad, 35 feet east of the

highway and 50 feet north of the track, in the fence line. A concrete post with disk in top. (663.736 meters or 2,177.607 feet.)

P 21.—At **Ontario**, Malheur County, in the south face of the Ford garage, near the southwest corner. A brass disk. (657.174 meters or 2,156.078 feet.)

Q 21.—At **Ontario**, Malheur County, in the south face of the First National Bank Building, at the corner of Main Street and Nevada Avenue, about 50 feet west of the southwest corner, and 4 feet above the ground. A brass disk. (656.780 meters or 2,154.786 feet.)

2143 H (U. S. G. S.).—At **Ontario**, Malheur County, 12 feet east of the northeast corner of Main Street and the road to the station, at the Carter House, formerly Brown's Hotel. An iron post stamped "2143 H." (655.807 meters or 2,151.593 feet.)

T 21.—At **Ontario**, Malheur County, in the north face of the Golden Rule Store at the corner of Main and Idaho Streets, 40 feet east of the northwest corner of the building corner. A brass disk. (656.802 meters or 2,154.858 feet.)

K.—At **Ontario**, Malheur County. In the west brick face of the Carter House, 3 feet north of the side door, and 5 feet above the ground. A copper bolt. (657.090 meters or 2,155.803 feet.)

For other bench marks at and near **Ontario**, see pages 12, 20.

LINE V. GAP RANCH TO BEND, OREG.

This line follows the highways from Gap Ranch through Hampton and Millican to Bend, Oreg. The field work was done between October 8 and November 3, 1920, by Casper M. Durgin, junior hydrographic and geodetic engineer, assisted by Floyd W. Hough, junior hydrographic and geodetic engineer, who operated a subparty.

For additional bench marks at Gap Ranch, see page 37.

S 21.—About $3\frac{1}{2}$ miles west of **Gap Ranch**, Harney County, 15 feet south of the Bend-Burns Road where it makes a turn around a knoll and enters the gap, at a point indicated by a pile of rocks. A concrete post with disk in top. (1,370.321 meters or 4,495.795 feet.)

V 21.—About 6 miles west of **Gap Ranch**, Harney County, 15 feet north of the Bend-Burns Road, at a point indicated by a pile of rocks. A concrete post with disk in top. (1,404.508 meters or 4,607.957 feet.)

W 21.—About $8\frac{3}{4}$ miles west of **Gap Ranch**, Harney County, 15 feet south of the Bend-Burns Road, at a point indicated by a pile of rocks. A concrete post with disk in top. (1,415.200 meters or 4,643.035 feet.)

X 21.—About $11\frac{1}{3}$ miles west of **Gap Ranch**, Harney County, 15 feet north of the Bend-Burns Road, on top of the first ridge east of **Glass Butte** at a point indicated by a pile of rocks. A concrete post with disk in top. (1,394.461 meters or 4,574.994 feet.)

Y 21.—About 14 miles west of **Gap Ranch**, Harney County, 15 feet south of the Bend-Burns Road, at a point indicated by a pile of rocks. A concrete post with disk in top. (1,357.342 meters or 4,453.213 feet.)

Z 21.—About $16\frac{3}{4}$ miles west of **Gap Ranch**, Harney County, 15 feet south of the Bend-Burns Road, near a lone juniper tree, at a point indicated by a pile of rocks. A concrete post with disk in top. (1,395.983 meters or 4,579.988 feet.)

A 22.—About $10\frac{1}{2}$ miles east of **Brookings Halfway House**, Deschutes County, 15 feet south of the Bend-Burns Road, at a point indicated by a pile of rocks. A concrete post with disk in top. (1,376.665 meters or 4,516.608 feet.)

B 22.—About 8 miles east of **Brookings Halfway House**, Deschutes County, in the acute angle formed by the Bend-Burns and the Bend-Stauffer Roads. A concrete post with disk in top. (1,359.947 meters or 4,461.759 feet.)

C 22.—About $5\frac{1}{2}$ miles east of **Brookings Halfway House**, Deschutes County, 15 feet north of the Bend-Burns Road, at a point indicated by a pile of rocks. A concrete post with disk in top. (1,348.073 meters or 4,424.771 feet.)

D 22.—About $2\frac{3}{4}$ miles east of **Brookings Halfway House**, Deschutes County, east of the Bend-Burns Road and 80 feet northwest of a white house, in a fence corner. A concrete post with disk in top. (1,346.654 meters or 4,418.147 feet.)

E 22.—At **Brookings Halfway House**, Deschutes County, 15 feet north of the Bend-Burns Road, in a fence corner north of the lane that runs from the road to Mr. Meek's homestead. A concrete post with disk in top. (1,346.185 meters or 4,416.609 feet.)

F 22.—About 3 miles west of **Brookings Halfway House**, Deschutes County, 15 feet south of the Bend-Burns Road at a point where it makes a right angle. A concrete post with disk in top. (1,346.653 meters or 4,418.144 feet.)

G 22.—About 5¼ miles west of **Brookings Halfway House**, Deschutes County, 15 feet east of the Bend-Burns Road, in a fence corner. A concrete post with disk in top. (1,345.536 meters or 4,414.479 feet.)

H 22.—About 9 miles west of **Brookings Halfway House**, Deschutes County, 15 feet north of the Bend-Burns road at the point where a road branches off to **Hampton** post office, in a fence corner. A concrete post with disk in top. (1,349.367 meters or 4,427.048 feet.)

I 22.—About 11¼ miles west of **Brookings Halfway House**, Deschutes County, 15 feet east of the Bend-Burns Road, in a fence corner at the old **Hampton** post office and south of the lane leading to the present **Hampton** post office. A concrete post with disk in top. (1,350.299 meters or 4,430.106 feet.)

J 22.—About 14½ miles west of **Brookings Halfway House**, Deschutes County, and ½ mile east of **Imperial**, 15 feet north of the Bend-Burns road, in a fence corner. A concrete post with disk in top. (1,368.783 meters or 4,490.740 feet.)

K 22.—About 16¾ miles west of **Brookings Halfway House**, Deschutes County, in the acute angle formed by the Bend-Burns Road and a road running due east and west. A concrete post with disk in top. (1,380.637 meters or 4,529.804 feet.)

L 22.—About 19 miles west of **Brookings Halfway House**, Deschutes County, 15 feet south of the Bend-Burns Road, in a fence corner in front of a house among some junipers. A concrete post with disk in top. (1,416.774 meters or 4,648.199 feet.)

M 22.—About 22¼ miles west of **Brookings Halfway House**, Deschutes County, 10 feet north of the Bend-Burns Road where it crosses a small knoll, at a point indicated by a pile of rocks. A concrete post with disk in top. (1,417.500 meters or 4,650.581 feet.)

N 22.—About 20¼ miles east of **Millican**, Deschutes County, in the acute angle formed by the Bend-Burns and the Bend-Brothers Roads. A concrete post with disk in top. (1,432.262 meters or 4,699.013 feet.)

O 22.—About 15½ miles east of **Millican**, Deschutes County, 15 feet north of the junction of the Bend-Burns and the Bend-Brothers Roads. A concrete post with disk in top. (1,370.912 meters or 4,497.734 feet.)

P 22.—About 13½ miles east of **Millican**, Deschutes County, 15 feet south of the Bend-Burns Road where it makes a right angle, ¾ mile south of the Percival ranch. A concrete post with disk in top. (1,361.318 meters or 4,466.257 feet.)

Q 22.—About 10¾ miles east of **Millican**, Deschutes County, 15 feet south of the Bend-Burns Road and 3 feet east of the gateway leading to a log cabin. A concrete post with disk in top. (1,340.267 meters or 4,397.193 feet.)

R 22.—About 8¾ miles east of **Millican**, Deschutes County, 25 feet south of the Bend-Burns Road, 400 feet west of the point where it makes a right angle. A concrete post with disk in top. (1,322.235 meters or 4,338.033 feet.)

S 22.—About 7 miles east of **Millican**, Deschutes County, 15 feet north of the Bend-Burns Road and 10 feet west of the gate to Bishop's ranch. A concrete post with disk in top. (1,324.461 meters or 4,345.336 feet.)

T 22.—About 3½ miles east of **Millican**, Deschutes County, 20 feet east of the Bend-Burns Road and 65 feet southwest of a yellow bungalow, in a fence corner. A concrete post with disk in top. (1,339.372 meters or 4,394.256 feet.)

U 22.—At **Millican**, Deschutes County, 15 feet south of the Bend-Burns Road and 35 feet northeast of the homestead shack adjoining **Millican's** store. A concrete post with disk in top. (1,311.787 meters or 4,303.754 feet.)

V 22.—About 3 miles west of **Millican**, Deschutes County, 15 feet north of the Bend-Burns Road, just inside the gate to Dyer's place. A concrete post with disk in top. (1,288.674 meters or 4,227.925 feet.)

W 22.—About 6¼ miles west of **Millican**, Deschutes County, 15 feet north of the Bend-Burns Road at the point where the Lakeview Road branches off, in

a fence corner. A concrete post with disk in top. (1,322.328 meters or 4,338.338 feet.)

X 22.—About $8\frac{1}{2}$ miles west of **Millican**, Deschutes County, 15 feet north of the Bend-Burns Road, in a fence corner. A concrete post with disk in top. (1,353.428 meters or 4,440.372 feet.)

Y 22.—About 11 miles west of **Millican**, Deschutes County, on the Bend-Burns Road, 65 feet southwest of Stuckey's ranch house, in the fence line. A concrete post with disk in top. (1,298.675 meters or 4,260.736 feet.)

Z 22.—About 13 miles west of **Millican**, Deschutes County, 15 feet south of the Bend-Burns Road, at a large mound of rocks. A concrete post with disk in top. (1,287.891 meters or 4,225.356 feet.)

A 23.—About $15\frac{1}{4}$ miles west of **Millican**, Deschutes County, 15 feet north of the Bend-Burns Road, at a large mound of rocks. A concrete post with disk in top. (1,248.638 meters or 4,096.573 feet.)

B 23.—About $17\frac{1}{2}$ miles west of **Millican**, Deschutes County, 15 feet north of the Bend-Burns Road, at a crossroad. A concrete post with disk in top. (1,206.053 meters or 3,956.859 feet.)

C 23.—About 9 miles east of **Bend**, Deschutes County, 15 feet north of the Bend-Burns Road, in a fence corner. A concrete post with disk in top. (1,166.628 meters or 3,827.512 feet.)

D 23.—About 7 miles east of **Bend**, Deschutes County, 15 feet north of the Bend-Burns Road where it makes a right angle, in the fence corner. A concrete post with disk in top. (1,144.734 meters or 3,755.681 feet.)

E 23.—About $4\frac{1}{2}$ miles east of **Bend**, Deschutes County, 20 feet west of the Bend-Burns Road, in a fence corner. A concrete post with disk in top. (1,129.604 meters or 3,706.042 feet.)

F 23.—About $2\frac{1}{2}$ miles east of **Bend**, Deschutes County, and 1 mile east of Pilot Butte at a point on the Bend-Burns Road where it makes a right angle, in a fence corner. A concrete post with disk in top. (1,104.411 meters or 3,623.388 feet.)

G 23.—At **Bend**, Deschutes County, in the southwest corner of the Deschutes Garage on the north side of Greenwood Avenue. A brass disk. (1,106.163 meters or 3,629.136 feet.)

H 23.—At **Bend**, Deschutes County, in the north wall of the Bend Hardware Store at the southeast corner of Bond Street and Minnesota Avenue, under a small window. A brass disk. (1,106.370 meters or 3,629.816 feet.)

I 23.—At **Bend**, Deschutes County, in the south wall of the Heyburn Hardware Co.'s store at the northeast corner of Wall Street and Minnesota Avenue. A brass disk. (1,105.783 meters or 3,627.890 feet.)

3629 B (U. S. G. S.).—At **Bend**, Deschutes County, on the west side of Wall Street, 250 feet north of its intersection with Nevada Street, 163 feet west of the old schoolhouse and 11 feet east of the Pilot Butte stable, at the sidewalk line in lava rock. An aluminum tablet stamped "3629 B 1908 B. J. 2." In 1924 it was reported that in all probability this bench mark is no longer in existence. (1,105.462 meters or 3,626.837 feet.)

The following bench marks were connected with the precise-level bench marks by Mr. Robert B. Gould, city engineer of Bend, who ran a line of levels around the city with a 22-inch level. Although not of precise-leveling accuracy, the levels provide a very desirable tie between the precise-level bench marks and those established by the city of Bend and the United States Geological Survey.

City No. 1.—At **Bend**, Deschutes County, on the west curb line of Wall Street at its intersection of the south curb line of Minnesota Avenue extended westerly, 1 foot southeast of the fire hydrant, a chiseled square which is the city of Bend standard bench mark and point of origin for city leveling. (1,104.223 meters or 3,622.771 feet.)

(U. S. G. S.) 3647 B.—At **Bend**, Deschutes County, in the east end of the town, on the west side of Harriman Street, on the center line of Greeley Avenue extended westerly, in lava rock outcrop. An aluminum tablet stamped "3647 B 1908 B. I. 2." (1,111.414 meters or 3,646.364 feet.)

For additional bench marks at Bend, see page 71.

LINE VI, WEED, CALIF., TO PORTLAND, OREG. (PART)

This is the Oregon portion of a line extending along the Southern Pacific Railroad from Weed, Calif., through Grants Pass, Roseburg, Eugene, Albany, Salem, and Portland, Oreg., to Auburn, Wash. The field work was done by C. A. Egner, junior hydrographic and geodetic engineer, from March 21 to June 13, 1920, and then by J. D. Crichton, junior hydrographic and geodetic engineer, until the close of the season, October 29, 1920. H. C. Warwich, junior hydrographic and geodetic engineer, operated a subparty during the entire season.

For a large part of its length this line closely parallels the Pacific Highway, and most of the bench marks are accessible from the highway.

G 35.—About $\frac{1}{2}$ mile north of Cole, Siskiyou County, Calif., on the Southern Pacific Railroad at mileage 403.2, 65 feet southwest of the sign "California-Oregon State Line." and 10 feet west of the track in rock. A brass disk. (873.550 meters or 2,865.972 feet.)

A 7 (U. S. G. S.).—About $4\frac{1}{2}$ miles south of Colestin, Jackson County, on the Southern Pacific Railroad, at mileage 404.4, 450 feet north of old milepost 406, 35 feet west of the track. An iron post stamped "2997 B 1903." (913.885 meters or 2,998.304 feet.)

B 7.—About $2\frac{1}{2}$ miles south of Colestin, Jackson County, on the Southern Pacific Railroad, at mileage 406.5, 15 feet west of the track, in culvert 406 H. A brass disk. (1,009.978 meters or 3,313.560 feet.)

C 7 (U. S. G. S.).—About $1\frac{3}{4}$ miles south of Colestin, Jackson County, on the Southern Pacific Railroad, at mileage 407.3, 150 feet south of old milepost 409, near culvert 407 E, and 35 feet north of the track. An iron post stamped "3445 B 1903." (1,050.399 meters or 3,446.184 feet.)

D 7 (U. S. G. S.).—About $1\frac{1}{4}$ miles north of Colestin, Jackson County, on the Southern Pacific Railroad, at mileage 410.4, 150 feet north of old milepost 412, and 35 feet east of the track. An iron post stamped "3922 B 1903." (1,195.749 meters or 3,923.053 feet.)

E 7.—About 1 mile south of Siskiyou, Jackson County, on the Southern Pacific Railroad, at mileage 411.3, 260 feet south of the south end of Siskiyou tunnel 13, and 15 feet east of the track, on the east end of the concrete culvert 411 C. A brass disk. (1,237.326 meters or 4,059.460 feet.)

F 7.—About 500 feet north of Siskiyou, Jackson County, on the Southern Pacific Railroad, 325 feet north of the north entrance of Siskiyou tunnel 13, near a switch stand, on the west edge of an old concrete turntable, east of and at the elevation of the track. A brass disk. (1,258.372 meters or 4,128.509 feet.)

G 7.—At Siskiyou, Jackson County, on the Southern Pacific Railroad, opposite the depot, on the top face of the rubble masonry culvert 412 A, west of and 3 feet below the level of the track. A brass disk. Reported destroyed, 1923. (1,253.250 meters or 4,111.704 feet.)

R 6 (U. S. G. S.).—About 1 mile north of Siskiyou, Jackson County, on the Southern Pacific Railroad, at mileage 413.6, 5 feet north of old milepost 415, and east of the track near culvert 413 F. An iron post stamped "3918 B 1903." (1,194.773 meters or 3,919.851 feet.)

H 7.—About $1\frac{1}{2}$ miles north of Siskiyou, Jackson County, on the Southern Pacific Railroad, on the top face of the north abutment of steel bridge 413 J over Wall Creek, east of the track and about 1 foot from the edge of the basalt top block. A rounded knob. (1,172.859 meters or 3,847.955 feet.)

I 7.—At Wall Creek, Jackson County, a flag station on the Southern Pacific Railroad, at mileage 415.6, 165 feet north of the signboard, 500 feet south of the home block signal at the end of the siding, 20 feet east of and 2 feet above the track, in the top face of a large granite boulder. A brass disk. (1,109.497 meters or 3,640.975 feet.)

F 6.—About 2 miles south of Steinman, Jackson County, on the Southern Pacific Railroad, at mileage 417.4, near the center of a sharp cut, about 70 feet from signals 4173 and 4174, 10 feet north and about 3 feet above the track, in

a rough projection of outcropping bedrock, near the switch stand for Follage Siding. A brass disk. (1,020.912 meters or 3,349.442 feet.)

G 6.—About $\frac{1}{3}$ mile south of **Steinman**, Jackson County, on the Southern Pacific Railroad, 200 feet north of milepost 419, east of the track and 3 feet above the ground, on the horizontal surface of the banister connecting the north and south posts of the most westerly central pier of the large concrete Pacific Highway overhead viaduct. A brass disk. (941.914 meters or 3,090.263 feet.)

Q 6 (U. S. G. S.).—At **Steinman**, Jackson County, on the Southern Pacific Railroad, at mileage 419.3, 360 feet south of the depot, east of the track and west of the Pacific Highway. An iron post stamped "3036 B 1903." (925.851 meters or 3,037.563 feet.)

H 6.—About $1\frac{1}{4}$ miles north of **Steinman**, Jackson County, on the Southern Pacific Railroad, at mileage 421.1, about 50 feet from the north end of a cut, 400 feet north of the plate girder bridge 421 A over Torrent Creek, east of and level with the track, in an outcropping bed of sandstone. A brass disk. (839.549 meters or 2,754.420 feet.)

P 6 (U. S. G. S.).—About $\frac{1}{2}$ mile south of **Mistletoe**, Jackson County, and $2\frac{3}{4}$ miles north of **Steinman**, on the Southern Pacific Railroad, at mileage 422.6, east of the track, at the fence line. An iron post stamped "2561 B 1903." (781.040 meters or 2,562.462 feet.)

E 6.—About $\frac{1}{2}$ mile north of **Mistletoe**, Jackson County, on the Southern Pacific Railroad, at mileage 423.4, on the north end of the deck plate girder bridge over Neil Creek, west of the track in the top sandstone block. A rounded knob. (732.630 meters or 2,403.637 feet.)

I 6.—About 1 mile north of **Mistletoe**, Jackson County, on the Southern Pacific Railroad, at mileage 424.1, at the south side of a slight cut and at a sharp curve, west of and 5 feet below the track, in outcropping bedrock. A brass disk. (692.678 meters or 2,272.561 feet.)

J 6 (U. S. G. S.).—At **Clawson**, Jackson County, on the Southern Pacific Railroad, at mileage 425.4, 10 feet north of the south end of the siding, west of the track, on the bank, at a telegraph pole near the fence line. An iron post stamped "2180 B 1903." (664.831 meters or 2,181.200 feet.)

K 6.—About 1 mile north of **Clawson**, Jackson County, on the Southern Pacific Railroad, 800 feet north of milepost 426, 20 feet west of the west end of culvert 426 B, west of and 7 feet below the track, in an outcropping bed of sandstone. A brass disk. (636.801 meters or 2,089.435 feet.)

L 6 (U. S. G. S.).—At **Ashland**, Jackson County, on the Southern Pacific Railroad, 1,800 feet south of the depot, at the Mountain Avenue crossing, near a fence corner on the south side of the street, 42 feet east of the main track. An iron post stamped "1874 B 1903." (571.495 meters or 1,874.980 feet.)

M 6.—At **Ashland**, Jackson County, about 165 feet from the city hall building, at the east end of Lithia Park, 80 feet west of the sidewalk line, in a granite boulder north of a path. A brass disk. (594.496 meters or 1,950.442 feet.)

N 6.—At **Ashland**, Jackson County, at the entrance to the public library on Main Street, in top of the concrete banister on the north side. A brass disk. (577.518 meters or 1,894.740 feet.)

O 6.—At **Ashland**, Jackson County, on the Southern Pacific Railroad, $\frac{1}{2}$ mile north of the depot, west of the track, in the south end of the concrete under-grade crossing 429 B. A brass disk. (505.720 meters or 1,856.033 feet.)

S 6.—About $3\frac{3}{4}$ miles north of **Ashland**, Jackson County, on the Southern Pacific Railroad, at mileage 432.8, opposite culvert 432 I and 200 feet east of the track, on the south end of a Pacific highway culvert, on top of railing, west of and 2 feet above the roadway. A brass disk. (520.391 meters or 1,707.316 feet.)

T 6 (U. S. G. S.).—At **Talent**, Jackson County, on the Southern Pacific Railroad, at mileage 434.6, about 10 feet from the northwest corner of the depot. An iron post stamped "1633. B 1903." (498.260 meters or 1,634.708 feet.)

V 6.—About 1 mile north of **Talent**, Jackson County, on the Southern Pacific Railroad, at mileage 435.5, east of the track, in the top face of the concrete culvert 435D. A brass disk. (483.374 meters or 1,585.870 feet.)

W 6 (U. S. G. S.).—About $\frac{3}{4}$ mile north of **Phoenix**, Jackson County, on the Southern Pacific Railroad, at mileage 437.6, near the second telegraph pole north of old milepost 439, east of the track at the fence line. An iron post stamped "1513 B 1903." (461.478 meters or 1,514.032 feet.)

X 6.—About $1\frac{1}{2}$ miles north of **Phoenix**, Jackson County, on the Southern Pacific Railroad, east of the track, on the top face of the concrete culvert 438B. A brass disk. (451.923 meters or 1,482.684 feet.)

U 6.—About $2\frac{1}{2}$ miles north of **Phoenix**, Jackson County, and $\frac{1}{2}$ mile north of **Voorhies**, on the Southern Pacific Railroad, at mileage 439.4, opposite culvert 439C, 325 feet east of the track on the northwest corner of the abutment of a highway culvert. A brass disk. (434.727 meters or 1,426.267 feet.)

Y 6 (U. S. G. S.).—At **Medford**, Jackson County, at the southeast corner of Front and Main Streets on the west face of the Nash Hotel, at the entrance. An aluminum tablet stamped "1376 B 1903." (419.784 meters or 1,377.241 feet.)

Z 6.—At **Medford**, Jackson County, on the lower step of the post office and court room, to the right of the main entrance, 8 inches from the wall. A brass disk. (421.322 meters or 1,382.287 feet.)

J 7.—At **Medford**, Jackson County, about 165 feet south of the Southern Pacific Railroad depot, in a small park, near an ornamental lamp-post in one corner. A concrete post with disk in top. (419.135 meters or 1,375.112 feet.)

K 7 (U. S. G. S.).—About $\frac{3}{4}$ mile south of **Central Point**, Jackson County, on the Southern Pacific Railroad, 1,200 feet south of milepost 445, at a road crossing, east of the track. An iron post stamped "1292 B 1903." (394.194 meters or 1,293.285 feet.)

L 7.—At **Central Point**, Jackson County, on the Southern Pacific Railroad, 1,000 feet north of the depot, west of the track, on culvert 445 D. A brass disk. (387.605 meters or 1,271.667 feet.)

M 7 (U. S. G. S.).—At **Seven Oaks**, Jackson County, and 2 miles north of **Central Point**, on the Southern Pacific Railroad, 75 feet north of the station sign and 10 feet east of the track. An iron post stamped "1214 B 1903." (370.502 meters or 1,215.555 feet.)

N 7.—About $\frac{1}{2}$ mile north of **Tolo**, Jackson County, on the Southern Pacific Railroad, 1,200 feet south of milepost 450, on the base of the northwest support of the Pacific Highway viaduct over the track, 6 feet west of the rail and 4 inches from the horizontal support. A brass disk. (360.424 meters or 1,182.491 feet.)

O 7 (U. S. G. S.).—About $\frac{1}{2}$ mile north of **Tolo**, Jackson County, on the Southern Pacific Railroad, 150 feet south of old milepost 452, east of the track, at a telegraph pole. An iron post stamped "1164 B 1903." (355.280 meters or 1,165.614 feet.)

P 7.—At **Ray Gold**, Jackson County, on the Southern Pacific Railroad, 15 feet north of the station sign, west of the track, on a large granite rock. A brass disk. (355.775 meters or 1,167.238 feet.)

Q 7 (U. S. G. S.).—About $2\frac{1}{8}$ miles north of **Ray Gold**, Jackson County, on the Southern Pacific Railroad, 1,400 feet south of milepost 454, and 15 feet east of the track. An iron post stamped "1137 B 1903." (346.986 meters or 1,138.403 feet.)

R 7.—About $\frac{1}{3}$ mile east of **Gold Hill**, Jackson County, on the Pacific Highway bridge over Rogue River, 125 feet north of Southern Pacific Railroad bridge 456 B, in the southwest concrete banister. A brass disk. (330.006 meters or 1,082.695 feet.) The Oregon State Highway Commission is planning to replace this bridge with a new structure south of the Southern Pacific Railroad, and when the new bridge is completed this bench mark will be transferred to a suitable new position.

S 7 (U. S. G. S.).—At **Gold Hill**, Jackson County, 25 feet west of the Southern Pacific Railroad depot, and 15 feet north of the track. An iron post stamped "1084 B 1903." (330.772 meters or 1,085.208 feet.)

T 7.—A complete description of this bench mark is not available. It is located about $1\frac{1}{2}$ miles west of **Gold Hill**, Jackson County, along the Southern Pacific Railroad. Reported as searched for but not found in 1923. (321.119 meters or 1,053.538 feet.)

U 7 (U. S. G. S.).—About $2\frac{1}{2}$ miles west of **Gold Hill**, Jackson County, on the Southern Pacific Railroad, at mileage 460.2, 10 feet north of the track. An iron post stamped "1049 B 1903." (320.101 meters or 1,050.198 feet.)

V 7 (U. S. G. S.).—About $5\frac{1}{2}$ miles west of **Gold Hill**, Jackson County, on the Southern Pacific Railroad, 1,600 feet west of milepost 463, 10 feet north of the track. An iron post stamped "1018 B 1903." (310.758 meters or 1,019.545 feet.)

W 7.—About $\frac{3}{4}$ mile south of **Rogue River**, Jackson County, on the Southern Pacific Railroad, 200 feet north of distant block signal 464.2, 10 feet east of the track, on culvert 464 B. A brass disk. (304.603 meters or 999.352 feet.)

X 7 (U. S. G. S.).—About $\frac{1}{2}$ mile west of **Rogue River**, Jackson County, on the Southern Pacific Railroad, at a private road crossing, 20 feet north of the track. An iron post stamped "993 B 1903." (303.057 meters or 994.280 feet.)

Y 7.—About $3\frac{1}{2}$ miles west of **Rogue River**, Jackson County, on the Southern Pacific Railroad, at the Jackson-Josephine County line, 20 feet west of the sign and 30 feet north of the track, on a large rock. A brass disk. (304.519 meters or 999.076 feet.)

Z 7 (U. S. G. S.).—About 2 miles east of **Grants Pass**, Josephine County, on the Southern Pacific Railroad, 1,600 feet east of present milepost 472 and 15 feet from old milepost 473, 200 feet east of the structure 471 F, and 25 feet north of the track. An iron post stamped "945 B 1903." (288.455 meters or 946.373 feet.)

A 8.—At **Grants Pass**, Josephine County, on the Southern Pacific Railroad, 150 feet east of the depot and 40 feet south of the track, on the north side of the water tank, between the two center supports. A brass disk. (285.499 meters or 936.675 feet.)

B 8.—At **Grants Pass**, Josephine County, in a granite post, 50 feet east of the southeast corner of the Josephine County courthouse. 6 feet from the inside edge of the sidewalk. A brass disk. (288.847 meters or 947.659 feet.)

C 8 (U. S. G. S.).—At **Grants Pass**, Josephine County, on the west face of the south corner of the Central School Building. An aluminum tablet stamped "956 B 1903." (291.651 meters or 956.858 feet.)

D 8.—At **Grants Pass**, Josephine County, on the campus of the Senior High School, 75 feet east of the walk to the main entrance and 125 feet north of **A Street**. A magnetic station of the United States Coast and Geodetic Survey consisting of a 9 by 9 inch marble post with a metal tablet in the top. (289.336 meters or 949.263 feet.)

E 8.—About $2\frac{1}{2}$ miles north of **Grants Pass**, Josephine County, on the Southern Pacific Railroad, at Granite, 1,000 feet north of a gravel pit, 50 feet west of the track, at the property line, and 500 feet north of the culvert 476 A. A concrete post with disk in top. (332.034 meters or 1,089.348 feet.)

F 8 (U. S. G. S.).—About $3\frac{3}{4}$ miles north of **Grants Pass**, Josephine County, on the Southern Pacific Railroad, at mileage 477.9, 100 feet south of culvert 477 I, and 15 feet east of the track. An iron post stamped "1218 B 1903." (371.470 meters or 1,218.731 feet.)

G 8.—About $6\frac{1}{2}$ miles north of **Grants Pass**, Josephine County, on the Southern Pacific Railroad, 2,500 feet south of milepost 481, 75 feet west of the county road, and 15 feet east of the track, on culvert 480 E. A brass disk. (323.733 meters or 1,062.114 feet.)

H 8 (U. S. G. S.).—About $6\frac{3}{4}$ miles north of **Grants Pass**, Josephine County, on the Southern Pacific Railroad, 1,500 feet south of milepost 481, 40 feet from the county road, and 15 feet east of the track on the right of way. An iron post stamped "1050 B 1903." (320.358 meters or 1,051.041 feet.)

J 8.—About 1 mile south of **Merlin**, Josephine County, on the Southern Pacific Railroad, east of the track, in the base of the distant block signal 481.6. A spike set in cement. (295.886 meters or 970.753 feet.)

I 8.—At **Merlin**, Josephine County, on the Southern Pacific Railroad, 400 feet north of the depot, 6 feet east of the track, the southeast end of the bridge 482 E over Louse Creek. A brass disk. (276.320 meters or 906.560 feet.)

K 8 (U. S. G. S.).—About $\frac{1}{2}$ mile south of **Hugo**, Josephine County, on the Southern Pacific Railroad, at mileage 486.8, 2 feet from the sign at the county road crossing, and 15 feet east of the track. An iron post stamped "1252 B 1903." (382.015 meters or 1,253.328 feet.)

L 8.—At **Hugo**, Josephine County, on the Southern Pacific Railroad, 1,000 feet north of the depot and 10 feet east of the track, on culvert 487 F. A brass disk. (396.333 meters or 1,300.303 feet.)

M 8.—About $1\frac{1}{4}$ miles north of **Hugo**, Josephine County, on the Southern Pacific Railroad, at mileage 489.1, 10 feet east of the track, in the top of culvert 489 C. A bolt set in cement. (436.142 meters or 1,430.909 feet.)

N 8.—About $\frac{1}{2}$ mile north of **Leland**, Josephine County, on the Southern Pacific Railroad, 6 feet east of the track, on culvert 494 D. A brass disk. (359.509 meters or 1,179.489 feet.)

O 8 (U. S. G. S.).—About $1\frac{1}{2}$ miles north of **Leland**, Josephine County, on the Southern Pacific Railroad, at mileage 495.4, 60 feet south of trestle 495 E

over Grave Creek. An iron post stamped "1098 B 1903." (334.892 meters or 1,098.725 feet.)

P 8.—About $1\frac{3}{4}$ miles south of **Wolf Creek**, Josephine County, on the Southern Pacific Railroad, 50 feet south of block signal 500.3, 25 feet west of the track, opposite culvert 500 A, in outcropping rock. A bolt set in cement. (371.401 meters or 1,218.505 feet.)

R 8 (U. S. G. S.).—At **Wolf Creek**, Josephine County, on the Southern Pacific Railroad, 400 feet west of the depot, 2 feet north of the Pacific Highway pavement, south of the track, opposite culvert 501 F. An iron post stamped "1289 B 1903." (393.319 meters or 1,290.414 feet.)

Q 8.—About $1\frac{1}{4}$ miles north of **Wolf Creek**, Josephine County, on the Southern Pacific Railroad, 3 feet east of and level with the track, on the undergrade crossing 503 B. A brass disk. (422.988 meters or 1,387.753 feet.)

S 8.—About $1\frac{1}{4}$ miles south of **Glendale**, Douglas County, on the Southern Pacific Railroad, 250 feet south of a private road crossing, 6 feet east of the track, in the top of culvert 506 G. A bolt set in cement. (408.070 meters or 1,535.660 feet.)

B 9 (U. S. G. S.).—At **Glendale**, Douglas County, on the Southern Pacific Railroad, $\frac{1}{4}$ mile south of the depot, south of the main road crossing, and 35 feet west of the track, near a telegraph pole. An iron post stamped "1425 B 1903." It was loose and leaning and, therefore, reset. (433.413 meters or 1,421.956 feet.)

T 8.—At **Glendale**, Douglas County, on the Southern Pacific Railroad, 200 feet north of the depot, 15 feet east of the track, on the southwest center support of the Southern Pacific Co. oil tank. A brass disk. (432.119 meters or 1,417.710 feet.)

U 8 (U. S. G. S.).—About $2\frac{1}{2}$ miles north of **Glendale**, Douglas County, on the Southern Pacific Railroad, at mileage 510.6, at a private road crossing, 25 feet east of the track. An iron post stamped "1366 B 1903." (416,725 meters or 1,367.205 feet.)

V 8 (U. S. G. S.).—About $5\frac{1}{4}$ miles north of **Glendale**, Douglas County, on the Southern Pacific Railroad, at mileage 513.8, 2,000 feet south of tunnel 7, and 25 feet east of the track. An iron post stamped "1288 B 1903." (392.802 meters or 1,288.718 feet.)

W 8.—About $1\frac{3}{4}$ miles south of **Brandt**, Douglas County, on the Southern Pacific Railroad, 1,500 feet north of milepost 515, 6 feet east of the track, on culvert 515 B. A brass disk. (377.320 meters or 1,237.924 feet.)

X 8 (U. S. G. S.).—At **Brandt**, Douglas County, on the Southern Pacific Railroad, 400 feet north of the station sign and 30 feet east of the track, at the foot of the path leading to the Banner Mine. An iron post stamped "1188 B 1903." (362.171 meters or 1,188.223 feet.)

Y 8.—About $3\frac{1}{4}$ miles south of **West Fork**, Douglas County, on the Southern Pacific Railroad, 300 feet north of milepost 519, 10 feet east of the track, in rock. A brass disk. (342.768 meters or 1,124.565 feet.)

Z 8 (U. S. G. S.).—About 2 miles south of **West Fork**, Douglas County, on the Southern Pacific Railroad, 90 feet north of block signal 519.7 and 10 feet east of the track. An iron post stamped "1099 B 1903." (335.234 meters or 1,099.847 feet.)

A 9.—About $\frac{1}{2}$ mile south of **West Fork**, Douglas County, on the Southern Pacific Railroad, 500 feet north of milepost 521, 10 feet east of the track, in the northeast abutment of bridge 521 A over Cow Creek. A bolt set in cement. (313.554 meters or 1,028.718 feet.)

C 9 (U. S. G. S.).—At **Cow Creek**, Douglas County, on the Southern Pacific Railroad, near the station sign, between the ties, 6 inches west of the main track. An iron post stamped "930 B 1903." (283.773 meters or 931.012 feet.)

D 9.—About $\frac{3}{4}$ mile south of **Union Creek**, Douglas County, on the Southern Pacific Railroad, 1,500 feet south of milepost 527, on culvert 526 D. A brass disk. (276.496 meters or 907.137 feet.)

E 9.—About $2\frac{1}{4}$ miles north of **Union Creek**, Douglas County, on the Southern Pacific Railroad, 150 feet south of the sign "Table Creek," 2 feet east of the track, on the north side of bridge 520 F over Table Creek. A brass disk. (260.359 meters or 854.194 feet.)

F 9.—About 1 mile south of **Byers**, Douglas County, on the Southern Pacific Railroad, 6 feet west of the track, in the top of culvert 534 A. A bolt in cement. (243.926 meters or 800.281 feet.)

U. S. G. S. 793.—About $\frac{3}{4}$ mile south of **Byers**, Douglas County, on the Southern Pacific Railroad, 325 feet north of distant block signal 534.6, 100 feet

south of culvert 534 I and 15 feet east of the track. An iron post stamped "793 B 1903." (241.825 meters or 793.388 feet.)

G 9 (U. S. G. S.).—About $2\frac{1}{4}$ miles north of **Byers**, Douglas County, at Southern Pacific Railroad mileage 537.7, 100 feet north of culvert 537 G, about 425 feet north of semaphore 537.6, 225 feet north of a private road crossing and 40 feet east of the track. An iron post stamped "752 B 1903." (229.408 meters or 752.846 feet.)

H 9.—About $5\frac{1}{2}$ miles south of **Riddle**, Douglas County, on the Southern Pacific Railroad, at mileage 538.7, 100 feet south of culvert 538 C, and 10 feet east of the track, on outcropping rock. A brass disk. (227.812 meters or 747.413 feet.)

I 9 (U. S. G. S.).—About 4 miles south of **Riddle**, Douglas County, on the Southern Pacific Railroad, at mileage 540.3, 90 feet northwest of the sign "Cornutt," 60 feet west of prune drier, north of the track, and 10 feet east of a creek. An iron post stamped "721 B 1903." (219.987 meters or 721.741 feet.)

J 9.—About $\frac{3}{8}$ mile south of the depot at **Riddle**, Douglas County, on the Southern Pacific Railroad, opposite culvert 543 F, in a county highway culvert. A bolt set in cement. (217.381 meters or 713.191 feet.)

K 9 (U. S. G. S.).—At **Riddle**, Douglas County, 30 feet west of the front face of Hotel Riddle, at the edge of the walk, 2 feet from a tree. An iron post stamped "705 B 1903." (215.103 meters or 705.717 feet.)

L 9.—About 500 feet north of the depot at **Riddle**, Douglas County, on the Southern Pacific Railroad, 10 feet east of the track, on culvert 544 C. A brass disk. (214.817 meters or 704.779 feet.)

M 9 (U. S. G. S.).—About $3\frac{1}{4}$ miles north of **Riddle**, Douglas County, on the Southern Pacific Railroad, 1,600 feet south of milepost 548, and 15 feet east of the track. An iron post stamped "642 B 1903." (195.691 meters or 642.030 feet.)

N 9.—About 1,500 feet south of the depot at **Myrtle Creek**, Douglas County, on the Southern Pacific Railroad, 10 feet west of the track, in the southwest abutment of bridge 550 B, over South Umpqua River. A brass disk. (186.921 meters or 613.257 feet.)

O 9 (U. S. G. S.).—At **Myrtle Creek**, Douglas County, in front of the Southern Pacific Railroad depot, 15 feet east of the track. An iron post stamped "612 B 1903." (186.694 meters or 612.512 feet.)

U. S. G. S. 639.—About $\frac{1}{2}$ mile north of **Myrtle Creek**, Douglas County, near the southeast corner of the Pacific Highway concrete bridge over South Umpqua River. An aluminum tablet stamped "639." (194.749 meters or 638.939 feet.) The connection with this bench mark was made by the Oregon State Highway Commission.

P 9.—About 3 miles north of **Myrtle Creek**, Douglas County, on the Southern Pacific Railroad, at mileage 553.5, east of the track, on culvert 553 F. A brass disk. (178.653 meters or 586.131 feet.)

Q 9.—About $\frac{1}{2}$ mile north of **Dole**, Douglas County, on the Southern Pacific Railroad, at mileage 555.6, south of the main road crossing, 200 feet south of the distant block signal 555.5, west of and 2 feet above the track in an outcropping of bedrock. A brass disk. (175.917 meters or 577.154 feet.)

R 9 (U. S. G. S.).—About 1 mile south of **Round Prairie**, Douglas County, on the Southern Pacific Railroad, at mileage 556.8, about 200 feet south of a private road crossing, east of the track near the fence line. An iron post stamped "570 B 1903." (173.806 meters or 570.229 feet.)

S 9 (U. S. G. S.).—About $2\frac{1}{4}$ miles south of **Dillard**, Douglas County, on the Southern Pacific Railroad, at a private road crossing, east of the track, one-third mile north from the Pacific Highway bridge over South Umpqua River. An iron post stamped "553 B 1903." (168.549 meters or 552.981 feet.)

T 9.—About $1\frac{1}{2}$ miles south of **Dillard**, Douglas County, on the Southern Pacific Railroad, at mileage 560.5, opposite culvert 560 A, on the east end of a culvert under the Pacific Highway, 0.1 mile south of highway milepost 210. A brass disk. (162.917 meters or 534.504 feet.)

U 9 (U. S. G. S.).—About 1 mile north of **Dillard**, Douglas County, on the Southern Pacific Railroad, at mileage 562.9, near the fifth telegraph pole north of the distant block signal 562.7, west of the track, at the fence line by a private road crossing. An iron post stamped "512 B 1903." (156.292 meters or 512.768 feet.)

V 9 (U. S. G. S.).—About 0.7 mile south of **Carnes**, Douglas County, on the Southern Pacific Railroad, at mileage 565.6, at a county road crossing, 25 feet

east of the track. An iron post stamped "553 B 1903." (170.300 meters or 558.726 feet.)

X 9.—About $\frac{1}{4}$ mile south of **Green**, Douglas County, on the Southern Pacific Railroad, at mileage 567.1, east of the track, on the north abutment of the concrete culvert 567 B. A brass disk. (155.852 meters or 511.324 feet.)

W 9 (U. S. G. S.).—About 1 mile north of **Green**, Douglas County, on the Southern Pacific Railroad, at mileage 568.7, 25 feet east of the track and 0.1 mile south from Pacific Highway crossing. An iron post stamped "501 B 1903." (152.831 meters or 501.413 feet.)

Z 9.—About $2\frac{3}{4}$ miles south of **Roseburg**, Douglas County, on the Southern Pacific Railroad, at mileage 569.7, 100 feet east of the track, opposite culvert 569, on a concrete highway culvert 0.8 mile south from highway milepost 201. A brass disk. (147.536 meters or 484.041 feet.)

Y 9 (U. S. G. S.).—At **Roseburg**, Douglas County, at the northeast corner of Oak and Pine Streets on the edge of the curb at the inside edge of the sidewalk, flush with the surface of the walk. An iron pipe stamped "464 B 1903." It was probably moved during construction of the sidewalk. (141.350 meters or 463.746 feet.)

A 10.—At **Roseburg**, Douglas County, west of the entrance to the county courthouse, 22 feet from the curb and 91 feet west of the sidewalk. A Coast and Geodetic Survey brass disk set in the top of a stone post which has the letters "U. S. G. S." chiseled in the four corners. The stone is flush with the ground. (145.524 meters or 477.440 feet.)

B 10.—At **Roseburg**, Douglas County, in the southwest corner of the post-office yard, 10 feet from the building, facing Cass Street and about 3 feet from the property lines of the two intersecting streets. A concrete post with a lead plug in top, flush with the ground. (145.955 meters or 478.854 feet.)

C 10.—About $1\frac{1}{2}$ miles north of **Roseburg**, Douglas County, on the Southern Pacific Railroad, 250 feet north of the station at **Edenbower**, 12 feet west of the track on the top face of culvert 574 C. A brass disk. (143.269 meters or 470.042 feet.)

U. S. G. S. 500.—About 2 miles north of **Roseburg**, Douglas County, on the Southern Pacific Railroad, $\frac{1}{2}$ mile north of the station at **Edenbower**, 20 feet west of the track, near the fence. An iron post stamped "500 B 1903." (152.502 meters or 500.334 feet.)

D 10.—About $\frac{1}{2}$ mile south of **Winchester**, Douglas County, on the Southern Pacific Railroad, 130 feet east of the track, on the northwest corner of a Pacific Highway bridge 0.6 mile south of highway milepost 194. A brass disk. (149.230 meters or 489.599 feet.)

E 10 (U. S. G. S.).—About $\frac{3}{4}$ mile south of **Winchester**, Douglas County, on the Southern Pacific Railroad, 30 feet east of the track, at the fence line at approximate highway mileage 194.3. An iron post stamped "472 B 1903." (144.109 meters or 472.798 feet.)

U. S. G. S. 459.6.—About $\frac{1}{4}$ mile north of **Winchester**, Douglas County, on the top of the wing wall at the southwest corner of the Pacific Highway concrete bridge over North Umpqua River. An aluminum tablet stamped "459.6." (140.088 meters or 459.605 feet.) The connection with this bench mark was made by the Oregon State Highway Commission.

F 10 (U. S. G. S.).—About $\frac{3}{4}$ mile south of **Wilbur**, Douglas County, on the Southern Pacific Railroad, 170 feet north of culvert 580 B, 30 feet east of the track, at the fence line. An iron post stamped "497 B 1903." (151.578 meters or 497.302 feet.)

G 10.—At **Wilbur**, Douglas County, on the Southern Pacific Railroad, 70 feet east of the track, 25 feet south of a fence corner, on a line with the north side of the section house and 2 feet from the fence line. A concrete post with disk in top. (142.142 meters or 466.344 feet.)

H 10 (U. S. G. S.).—About $3\frac{1}{2}$ miles south of **Sutherlin**, Douglas County, on the Southern Pacific Railroad, at mileage 583.7, 1,000 feet south of the station at **Deady**, 25 feet west of the track, 20 feet east of Pacific Highway pavement, and 0.8 mile south of highway milepost 188. An iron post stamped "486 B 1903." (148.156 meters or 486.075 feet.)

I 10.—At **Sutherlin**, Douglas County, 80 feet north of the Southern Pacific Railroad depot, 90 feet east of the track, on the north side of the street, 18 inches from a lamp-post. A brass disk. (157.713 meters or 517.430 feet.)

J 10 (U. S. G. S.).—About $\frac{1}{2}$ mile north of **Sutherlin**, Douglas County, on the Southern Pacific Railroad, at mileage 586.8, at a road crossing, and 20

feet west of the track. An iron post stamped "538 B 1903." (164.179 meters or 538.644 feet.)

L 10 (U. S. G. S.).—At **Oakland**, Douglas County, 150 feet east of the Southern Pacific Railroad track, in the edge of a small park, 120 feet west of the entrance to a brick hotel. An iron post stamped "429 B 1903." (130.837 meters or 429.254 feet.)

K 10.—About $\frac{1}{4}$ mile north of the depot at **Oakland**, Douglas County, on the Southern Pacific Railroad, 30 feet west of the track, on the south end of east abutment of a bridge. A brass disk. (129.935 meters or 426.295 feet.) This bridge will doubtless be destroyed soon but it is possible that the abutment, in which the bench mark is set, will remain for some time.

U. S. G. S.—About $\frac{1}{4}$ mile north of **Oakland**, Douglas County, in the curb at the southeast corner of the Oregon State Highway Department's concrete overcrossing and bridge. The bridge crosses Calapooya Creek and the Southern Pacific Railroad. A United States Geological Survey brass tablet. (138.240 meters or 453.542 feet.)

S 10 (U. S. G. S.).—About $3\frac{1}{2}$ miles north of **Oakland**, Douglas County, on the Southern Pacific Railroad, at mileage 592.7, 200 feet south of culvert No. 592 C, 25 feet east of the track, and 2 feet from the fence line. An iron post stamped "464 B 1903." (141.499 meters or 464.235 feet.)

M 10 (U. S. G. S.).—About $\frac{1}{4}$ mile north of **Isadora**, Douglas County, along the Southern Pacific Railroad, 3 feet south of milepost 597 at the east fence line. An iron post stamped "584 B 1903." (178.120 meters or 584.382 feet.)

N 10.—At **Rice Hill**, Douglas County, on the Southern Pacific Railroad, 300 feet north of the depot, 100 feet west of the track, on the top face of the west edge of the turntable. A brass disk. (218.508 meters or 710.327 feet.)

O 10 (U. S. G. S.).—About 1 mile north of **Rice Hill**, Douglas County, on the Southern Pacific Railroad, at mileage 598.6, 10 feet east of the track, at a highway crossing. An iron post stamped "617 B 1903." Not found in 1923. (188.169 meters or 617.351 feet.)

P 10 (U. S. G. S.).—About 2 miles south of **Yoncalla**, Douglas County, on the Southern Pacific Railroad, at mileage 601.7, 30 feet east of the track, at the fence line. An iron post stamped "389 B 1903." (118.649 meters or 389.268 feet.)

Q 10 (U. S. G. S.).—About 2 miles north of **Yoncalla**, Douglas County, on the Southern Pacific Railroad, 100 feet south of block signal 605.7, and 30 feet east of the track at the fence line. An iron post stamped "329 B 1903." (100.409 meters or 329.425 feet.)

R 10.—About $2\frac{1}{2}$ miles north of **Yoncalla**, Douglas County, on the Southern Pacific Railroad, at mileage 606.4, opposite culvert 606 B, 60 feet west of the track, in the east end of a Pacific Highway culvert 0.7 mile south of highway milepost 165. A brass disk. (101.844 meters or 334.133 feet.)

T 10 (U. S. G. S.).—About 500 feet north of the depot at **Drain**, Douglas County, on the Southern Pacific Railroad, 20 feet west of the main track. An iron post stamped "298 B 1903." (90.954 meters or 298.405 feet.)

U 10.—About $1\frac{3}{4}$ miles north of **Drain**, Douglas County, on the Southern Pacific Railroad, at mileage 610.7, 8 feet west of the track, on the north abutment of bridge 610 G over Pass Creek, 500 feet southerly from Pacific Highway milepost 161. A brass disk. (95.718 meters or 314.035 feet.)

V 10.—About $\frac{3}{4}$ mile north of **Leona**, Douglas County, on the Southern Pacific Railroad, 8 feet east of the track, on the southeast abutment of bridge 612 A, over Pass Creek. A brass disk. (99.662 meters or 326.974 feet.)

W 10.—About $\frac{1}{2}$ mile south of **Comstock**, Douglas County, on the Southern Pacific Railroad, on the southern column of the Pacific Highway overhead crossing, 12 feet west of the track, set vertically. A brass disk. (130.750 meters or 428.998 feet.)

X 10 (U. S. G. S.).—About $\frac{1}{4}$ mile south of **Comstock**, Douglas County, on the Southern Pacific Railroad, 30 feet east of the track, 80 feet south of culvert 617 D, near a telegraph pole. An iron post stamped "438 B 1903." (133.494 meters or 437.972 feet.)

Y 10 (U. S. G. S.).—About 1 mile south of **Divide**, Lane County, on the Southern Pacific Railroad, at mileage 620.9, 1,000 feet south of the Douglas-Lane County line, and 15 feet west of the track. An iron post stamped "676 B 1903." (206.279 meters or 676.707 feet.)

Z 10.—About $\frac{1}{4}$ mile west of **Divide**, Lane County, on the Southern Pacific Railroad, at mileage 621.7, 25 feet south of the track, on the west end of the

concrete drain culvert under the Pacific Highway overhead crossing. A brass disk. (225.555 meters or 740.008 feet.)

A 11 (U. S. G. S.).—About $1\frac{1}{4}$ miles north of **Divide**, Lane County, on the Southern Pacific Railroad, at mileage 623.6, 25 feet west of the track, at the fence line and 0.9 mile south of Pacific Highway milepost 147. An iron post stamped "690 B 1903." (210.526 meters or 690.701 feet.)

B 11 (U. S. G. S.).—At **Cottage Grove**, Lane County, on the southwest corner of Sixth and Main Streets, on the second step of the First National Bank, in a small recess to the left of the entrance. An aluminum tablet stamped "640 B 1903." (195.138 meters or 640.215 feet.)

C 11.—At **Cottage Grove**, Lane County, 100 feet east of the Southern Pacific Railroad depot, on the base of the southwest center support of the water tank. A brass disk. (195.833 meters or 642.495 feet.)

D 11.—At **Saginaw**, Lane County, on the Southern Pacific Railroad, 100 feet southwest of the depot, 60 feet west of the track, on the northeast corner of the Pacific Highway culvert. A brass disk. (186.995 meters or 613.499 feet.)

E 11 (U. S. G. S.).—About 1 mile north of **Saginaw**, Lane County, on the Southern Pacific Railroad, 1,000 feet south of milepost 630, 25 feet east of the track. An iron post stamped "603 B 1903." (183.843 meters or 603.158 feet.)

F 11 (U. S. G. S.).—About $2\frac{3}{4}$ miles south of **Creswell**, Lane County, on the Southern Pacific Railroad, 2,000 feet south of milepost 633, 25 feet east of the track. An iron post stamped "572 B 1903." (174.548 meters or 572.663 feet.)

H 11 (U. S. G. S.).—About 3 miles north of **Creswell**, Lane County, on the Southern Pacific Railroad, at mileage 638.6, 900 feet south of a road crossing, and 10 feet west of the track. An iron post stamped "513 B 1903." Not found 1923. (156.442 meters or 513.260 feet.)

I 11.—At **Goshen**, Lane County, on the Southern Pacific Railroad, 150 feet south of the depot, 20 feet east of the track, in the base of an old water tank, on the southwest center block of concrete. A brass disk. (152.164 meters or 499.225 feet.)

J 11 (U. S. G. S.).—About $\frac{3}{4}$ mile north of **Goshen**, Lane County, on the Southern Pacific Railroad, at mileage 641.7, 200 feet north of culvert 641 E, 25 feet west of the track. An iron post stamped "493 B 1903." (150.512 meters or 493.805 feet.)

K 11 (U. S. G. S.).—About 3 miles south of **Eugene**, Lane County, on the Southern Pacific Railroad, 100 feet northwest of the station of **Springfield Junction**, 30 feet west of the track. An iron post stamped "446 B 1903." (136.268 meters or 447.073 feet.)

L 11.—About $1\frac{1}{2}$ miles south of the depot at **Eugene**, Lane County, on the Southern Pacific Railroad, 70 feet southwest of the south city limit sign, 15 feet east of the track, on the concrete culvert No. 645 B. A brass disk. (136.772 meters or 448.726 feet.)

M 11 (U. S. G. S.).—At **Eugene**, Lane County, in the University of Oregon campus, on the southeast face of Villard Hall, 2 inches below the date "1885." An aluminum tablet stamped "449 B 1903." (136.932 meters or 449.251 feet.)

N 11.—At **Eugene**, Lane County, on the post-office building, at the left of the side entrance, on the top face of the lower step. A brass disk. (128.422 meters or 421.331 feet.)

O 11.—At **Eugene**, Lane County, on the top of the retaining wall of the southwest abutment of the Ferry Street bridge over the Willamette River, 6 feet from the railing. A brass disk. (130.751 meters or 428.972 feet.)

P 11 (U. S. G. S.).—About $1\frac{1}{2}$ miles north of **Eugene**, Lane County, on the Southern Pacific Railroad, $\frac{1}{2}$ mile south of milepost 649, 25 feet east of the track. An iron post stamped "407 B 1903." (124.141 meters or 407.286 feet.)

Q 11.—About $1\frac{1}{2}$ miles south of **Irving**, Lane County, on the Southern Pacific Railroad, at mileage 651.7, 10 feet east of the track, on the top face of the concrete culvert No. 651 D. A brass disk. (117.393 meters or 385.147 feet.)

R 11 (U. S. G. S.).—About $\frac{3}{4}$ mile south of **Irving**, Lane County, on the Southern Pacific Railroad, at mileage 652.2, 25 feet east of the track at the county road crossing. An iron post stamped "382 B 1903." (116.576 meters or 382.466 feet.)

S 11 (U. S. G. S.).—About 2 miles north of **Irving**, Lane County, on the Southern Pacific Railroad, 500 feet south of mile pole 655, 3 feet from red telephone pole and 25 feet east of the track. An iron post stamped "363 B 1903." (110.802 meters or 363.523 feet.)

T 11.—About $\frac{1}{4}$ mile north of **Luper**, Lane County, on the Southern Pacific Railroad, at mileage 655.8, 600 feet south of a road crossing, and 10 feet east

of the track, on the top face of the concrete culvert 655 D. A brass disk. (108.126 meters or 354.743 feet.)

U 11 (U. S. G. S.).—About $2\frac{3}{4}$ miles south of **Junction City**, Lane County, on the Southern Pacific Railroad, at mileage 657.8, 25 feet east of the track. An iron post stamped "340 B 1903." (103.904 meters or 340.892 feet.)

V 11.—At **Junction City**, Lane County, 400 feet east of the Southern Pacific Railroad depot, on the southwest banister of a Pacific Highway culvert, set flush with the top face. A brass disk. (99.342 meters or 325.925 feet.)

W 11 (U. S. G. S.).—About $1\frac{1}{4}$ miles north of **Junction City**, Lane County, on the Southern Pacific Railroad, 200 feet south of milepost 662, 20 feet east of the track. An iron post stamped "319 B 1903." (97.341 meters or 319.360 feet.)

X 11.—At **Harrisburg**, Linn County, 500 feet south of the Southern Pacific Railroad depot, 30 feet west of the track, on the north railing of a street culvert, set flush with the top face. A brass disk. (94.106 meters or 308.746 feet.)

Y 11 (U. S. G. S.).—About $2\frac{3}{4}$ miles north of **Harrisburg**, Linn County, on the Southern Pacific Railroad, 800 feet south of milepost 668, 30 feet east of the track. An iron post stamped "302 B 1903." (92.341 meters or 302.955 feet.)

A 12 (U. S. G. S.).—About $2\frac{3}{4}$ miles south of **Halsey**, Linn County, on the Southern Pacific Railroad, 200 feet south of milepost 671, 25 feet east of the track. An iron post stamped "291 B 1903." (88.936 meters or 291.784 feet.)

B 12.—At **Halsey**, Linn County, on the Southern Pacific Railroad, $\frac{1}{4}$ mile southwest of the depot, 800 feet west of the track, on the top face of a highway culvert. A brass disk. (86.467 meters or 283.684 feet.)

C 12 (U. S. G. S.).—At **Halsey**, Linn County, on the Southern Pacific Railroad, 100 feet north of the depot, 20 feet east of the track. An iron post stamped "281 B 1903." (85.883 meters or 281.768 feet.)

D 12 (U. S. G. S.).—About $3\frac{1}{4}$ miles north of **Halsey**, Linn County, on the Southern Pacific Railroad, 125 feet south of milepost 677, 25 feet east of the track. An iron post stamped "266 B 1903." (81.325 meters or 266.814 feet.)

E 12.—At **Shedd**, Linn County, on the Southern Pacific Railroad, 300 feet south of the depot, 100 feet west of the main track, on the northeast base of the four center supports to the water tank. A brass disk. (80.264 meters or 263.333 feet.)

F 12 (U. S. G. S.).—About 2 miles north of **Shedd**, Linn County, on the Southern Pacific Railroad, 500 feet south of milepost 681, 25 feet east of the track. An iron post stamped "249 B 1903." (76.112 meters or 249.711 feet.)

G 12.—About $1\frac{3}{4}$ miles south of **Tangent**, Linn County, on the Southern Pacific Railroad, at mileage 682.1, on bridge 682 A over Calapooya River, on the southwest retaining wall. A brass disk. (76.098 meters or 249.655 feet.)

H 12 (U. S. G. S.).—About 1.6 miles south of **Tangent**, Linn County, on the Southern Pacific Railroad, 250 feet south of milepost 683, 25 feet east of the track. An iron post stamped "242 B 1903." (74.087 meters or 243.067 feet.)

I 12.—At **Tangent**, Linn County, 200 feet north of the Southern Pacific Railroad depot and 100 feet east of the track, at the side entrance to R. C. Bailey's garage and blacksmith shop. A brass disk. (75.574 meters or 247.946 feet.)

J 12 (U. S. G. S.).—About $1\frac{1}{2}$ miles north of **Tangent**, Linn County, on the Southern Pacific Railroad, 75 feet south of milepost 686, 25 feet east of the track. An iron post stamped "240 B 1903." (73.460 meters or 241.010 feet.)

K 12.—About $3\frac{1}{2}$ miles south of **Albany**, Linn County, on the Southern Pacific Railroad, at mileage 687.5, 10 feet east of the track, on the top face of culvert 687 D. A brass disk. (71.343 meters or 234.064 feet.)

L 12 (U. S. G. S.).—About 2 miles south of **Albany**, Linn County, on the Southern Pacific Railroad, 50 feet north of milepost 689, 25 feet east of the track. An iron post stamped "221 B 1903." (67.667 meters or 222.004 feet.)

M 12.—At **Albany Junction**, Linn County, on the Southern Pacific Railroad, at mileage 689.7, between the main and the spur track, at a fence corner about 35 feet east of and 3 feet below the center track. A concrete post with disk in top. (67.692 meters or 222.086 feet.)

N 12.—At **Albany**, Linn County, on the Southern Pacific Co. water tank, on the base of the southwest center support. A brass disk. (65.798 meters or 215.872 feet.)

O 12.—At **Albany**, Linn County, on the corner of Ninth and Ferry Streets, on the first step of the west entrance to the Central School. A brass disk. (65.127 meters or 213.671 feet.)

P 12 (U. S. G. S.).—At **Albany**, Linn County, at the main entrance of the Linn County courthouse, on the top face of the first step. An aluminum tablet stamped "214." (65.279 meters or 214.170 feet.)

Q 12.—At **Albany**, Linn County, on the lower step of the side entrance to the post office, at the left side of the entrance. A brass disk. (63.967 meters or 209.865 feet.)

R 12.—About 3 miles north of **Albany**, Linn County, on the Southern Pacific Railroad, at mileage 693.8, 100 feet east of the track, opposite bridge 693 C, on the west side of the center pier of a highway bridge. A brass disk. (60.306 meters or 197.854 feet.)

S 12 (U. S. G. S.).—About 3 miles north of **Albany**, Linn County, on the Southern Pacific Railroad, at a highway crossing, 15 feet east of the track and on the west edge of the highway. An iron post stamped "210 B 1903." (64.372 meters or 211.194 feet.)

T 12 (U. S. G. S.).—About 1½ miles north of **Millersburg**, Linn County, on the Southern Pacific Railroad, 200 feet north of milepost 697, 200 feet south of a private road crossing, and 20 feet east of the track. An iron post stamped "214 B 1903." (65.313 meters or 214.281 feet.)

U 12.—In **Linn County**, about 1¼ miles south of **Jefferson**, Marion County, on the Southern Pacific Railroad, at mileage 698.3, 80 feet west of the track, opposite culvert 698 B, on the retaining wall of a highway bridge. A brass disk. (66.108 meters or 216.889 feet.)

V 12.—About ½ mile south of **Jefferson**, Marion County, on the Southern Pacific Railroad, near the Linn-Marion County line sign, at the north side of bridge 699 A over Santiam River, on the northwest end of the retaining wall. A bolt. (71.672 meters or 235.144 feet.)

W 12 (U. S. G. S.).—About ½ mile north of **Jefferson**, Marion County, on the Southern Pacific Railroad, 50 feet south of milepost 700, 100 feet south of a highway crossing, and 25 feet east of the track. An iron post stamped "235 B 1903." (71.834 meters or 235.675 feet.)

X 12 (U. S. G. S.).—About 3½ miles north of **Jefferson**, Marion County, on the Southern Pacific Railroad, 125 feet south of milepost 703, 30 feet east of the track. An iron post stamped "287 B 1903." (87.812 meters or 288.097 feet.)

Y 12.—About ¾ mile north of **Marion**, Marion County, on the Southern Pacific Railroad, 350 feet south of milepost 705, 15 feet east of the track, on culvert 704 C. A brass disk. (93.971 meters or 308.303 feet.)

Z 12 (U. S. G. S.).—About 1¼ miles north of **Marion**, Marion County, on the Southern Pacific Railroad, 200 feet north of milepost 706, 30 feet west of the track. An iron post stamped "327 B 1903." (99.965 meters or 327.969 feet.)

B 13 (U. S. G. S. Primary Traverse Station No. 30, 1913).—About 1½ miles south of **Turner**, Marion County, on the Southern Pacific Railroad, at mileage 709.1, 30 feet west of the track. An iron post stamped "308 B 1903." (94.168 meters or 308.950 feet.)

C 13.—About 1 mile south of **Turner**, Marion County, on the Southern Pacific Railroad, at mileage 709.7, on the top face of culvert 709 C, west of the track. A brass disk. (91.030 meters or 298.654 feet.)

D 13.—At **Turner**, Marion County, 300 feet east of the Southern Pacific Railroad depot and 10 feet north of the east end of the footbridge leading from the depot, on the concrete retaining wall of the Oregon Light & Power Co. ditch, in line with the south wall of Robertson's store. A brass disk. (86.875 meters or 285.022 feet.)

E 13 (U. S. G. S. Primary Traverse Station No. 29, 1913).—About 1¾ miles north of **Turner**, Marion County, on the Southern Pacific Railroad, 210 feet north of milepost 712, 30 feet west of the track. An iron post stamped "261 B 1903." (79.875 meters or 262.057 feet.)

F 13.—About 1¾ miles north of **State School**, Marion County, on the Southern Pacific Railroad, at mileage 714.6, on the southeast end of culvert 714 A. (67.840 meters or 222.572 feet.)

G 13 (U. S. G. S. Primary Traverse Station No. 28, 1913).—About 2¾ miles south of **Salem**, Marion County, on the Southern Pacific Railroad, 30 feet south of a road crossing, at cattle guard 715 A. An iron post stamped "207 B 1903." (63.434 meters or 208.116 feet.)

H 13.—At **Salem**, Marion County, 400 feet west of the Southern Pacific Railroad depot, on the east side of south Twelfth Street, in the top face of the retaining wall of a bridge. A brass disk. (48.218 meters or 158.195 feet.)

I 13 (U. S. G. S.).—At Salem, Marion County, in the south face of the State Capitol, just east of the entrance to the ground floor. An aluminum tablet stamped "171 B 1903." (52.289 meters or 171.551 feet.)

J 13.—At Salem, Marion County, near the main entrance to the post office, to the right of the steps, on a block of granite. A brass disk. (48.380 meters or 158.727 feet.)

K 13.—About 1 mile north of Salem, Marion County, on the Southern Pacific Railroad, 1,000 feet south of the tile works, 15 feet west of the track, on culvert 719 B. A brass disk. (50.716 meters or 166.391 feet.)

L 13 (U. S. G. S.).—About 2¾ miles north of Salem, Marion County, on the Southern Pacific Railroad, 12 feet from milepost 721, 20 feet east of the track. An iron post stamped "162 B 1903." (49.486 meters or 162.355 feet.)

M 13.—At Chemawa, Marion County, 400 feet north of the Southern Pacific Railroad depot, 100 feet east of the track, at the Indian School, on the top face of the step railing of the superintendent's office. A brass disk. (50.323 meters or 165.101 feet.)

N 13.—At Brooks, Marion County, on the Southern Railroad, 400 feet north of the depot, 75 feet south of milepost 727, 25 feet east of the county road, on culvert 726 E. A brass disk. (55.010 meters or 180.479 feet.)

U. S. G. S. 183.—At Brooks, Marion County, 200 feet north of the Southern Pacific Railroad depot and 14 feet east of the track. An iron post stamped "183 ft.—No. 85—1913." (55.895 meters or 183.382 feet.)

O 13.—About 2 miles north of Brooks, Marion County, on the Southern Pacific Railroad, 1,000 feet north of milepost 729, 8 feet west of the track, on culvert 729 B. A brass disk. (55.602 meters or 182.421 feet.)

P 13 (U. S. G. S. Primary Traverse Station No. 47, 1913).—About 4¼ miles north of Brooks, Marion County, on the Southern Pacific Railroad, 300 feet north of milepost 731, 20 feet east of the track. An iron post stamped "182 B 1903." (55.572 meters or 182.322 feet.)

Q 13.—At Gervais, Marion County, 200 feet east of the Southern Pacific Railroad track, in front of the Gervais State Bank, 10 feet to the left of the entrance, 8 inches from the wall. A brass disk. (55.856 meters or 183.254 feet.)

R 13 (U. S. G. S. Primary Traverse Station No. 48, 1913).—About 1 mile north of Gervais, Marion County, on the Southern Pacific Railroad, 125 feet south of milepost 733, 30 feet east of the track. An iron post stamped "183 B 1903." (56.137 meters or 184.176 feet.)

S 13 (U. S. G. S. Primary Traverse Station No. 49, 1913).—At Woodburn, Marion County, on the Southern Pacific Railroad, 210 feet south of the depot and 30 feet east of the track. An iron post stamped "181 B 1903." (55.527 meters or 182.175 feet.)

T 13.—At Woodburn, Marion County, to the right of the main entrance of the Woodburn city hall, on the top step. A brass disk. (55.907 meters or 183.422 feet.)

U 13.—At Hubbard, Marion County, in the recess at the right side of the entrance to the State Bank. A brass disk. (55.539 meters or 182.214 feet.)

V 13.—About 2 miles north of Hubbard, Marion County, on the Southern Pacific Railroad, 1,000 feet south of milepost 741, 1,000 feet north of a road crossing near a country schoolhouse, and 15 feet west of the track, on culvert 740 C. A brass disk. (55.226 meters or 181.187 feet.)

W 13 (U. S. G. S. Primary Traverse Station No. 57, 1903).—About 3¼ miles north of Hubbard, Marion County, on the Southern Pacific Railroad, 35 feet north of milepost 742, 30 feet east of the track. An iron post stamped "184 B 1903." (56.171 meters or 184.288 feet.)

X 13.—About ½ mile north of Aurora, Clackamas County, on the Southern Pacific Railroad, on bridge 743 D over Pudding River, on the northeast end of a concrete pier, 6 feet east of the track. A brass disk. (31.228 meters or 102.454 feet.)

Y 13 (U. S. G. S.).—At Barlow, Clackamas County, on the Southern Pacific Railroad, 50 feet north of the depot and 30 feet east of the track. An iron post stamped "100 B 1903." (30.678 meters or 100.649 feet.)

Z 13.—About ¾ mile south of Canby, Clackamas County, on the Southern Pacific Railroad, at mileage 746, on the northwest end of the retaining wall of the bridge over Molalla River. A chiseled circle. (38.752 meters or 127.139 feet.)

A 14.—At Canby, Clackamas County, 100 feet south of the Southern Pacific Railroad depot and 125 feet west of the track, in the top face of the second

step of the First National Bank of Canby, 6 inches from the wall to the left of the entrance. A brass disk. (46.446 meters or 152.382 feet.)

B 14 (U. S. G. S.).—About 1 mile north of **Canby**, Clackamas County, on the Southern Pacific Railroad, 300 feet south of milepost 748, 20 feet east of the track. An iron post stamped "130 B 1903." (39.726 meters or 130.334 feet.)

C 14.—About $\frac{1}{4}$ mile south of the depot at **New Era**, Clackamas County, on the Southern Pacific Railroad, at mileage 749.8, 10 feet west of the track, on the top face of culvert 749 M. A brass disk. (30.852 meters or 101.220 feet.)

D 14 (U. S. G. S.).—About $\frac{1}{2}$ mile north of **Coalea**, Clackamas County, on the Southern Pacific Railroad, 60 feet south of milepost 751, 25 feet east of the track. An iron post stamped "59 B 1903." (27.294 meters or 89.547 feet.)

E 14.—About $1\frac{1}{4}$ miles south of **Oregon City**, Clackamas County, on the Southern Pacific Railroad, at mileage 754.3, opposite culvert 754 D, on rock. An outlined square. (21.634 meters or 70.978 feet.)

F 14.—About $\frac{1}{2}$ mile south of the depot at **Oregon City**, Clackamas County, on the Southern Pacific Railroad, 300 feet south of the city limits, on the north end of the retaining wall, 6 feet west of the track. A brass disk. (21.227 meters or 69.642 feet.)

G 14.—At **Oregon City**, Clackamas County, on the wall at the edge of the walk, 3 feet from the fence leading to the Clackamas County courthouse. A brass disk. (19.382 meters or 63.589 feet.)

H 14.—At **Oregon City**, Clackamas County, on Seventeenth Street, 300 feet east of the Southern Pacific Railroad track, at the edge of the highway, on the Oregon Trail Monument. A quarter-inch pipe 3 inches of which protrudes above the base of the monument. (13.908 meters or 45.630 feet.)

I 14 (U. S. G. S.).—About $1\frac{1}{2}$ miles north of **Oregon City**, Clackamas County, on the Southern Pacific Railroad, 75 feet south of a road crossing, 16 feet east of the track. An iron post stamped "45 B 1903." (13.842 meters or 45.413 feet.)

J 14.—At **Clackamas**, Clackamas County, 300 feet north of the Southern Pacific Railroad depot, in front of the store belonging to A. S. Ellis, on the northwest corner of the curbing. A brass disk. (33.731 meters or 110.666 feet.)

K 14.—About $1\frac{1}{3}$ miles north of **Clackamas**, Clackamas County, and $\frac{1}{3}$ mile north of **Haskell**, 150 feet east of the Southern Pacific Railroad track, on the retaining wall of a highway bridge. Not found, 1923. A brass disk. (28.369 meters or 93.074 feet.)

L 14 (U. S. G. S.).—About 1 mile south of **East Milwaukie**, Clackamas County, on the Southern Pacific Railroad, 75 feet north of milepost 763, 25 feet east of the track. An iron post stamped "109 B 1903." Reported probably destroyed, 1923. (33.316 meters or 109.304 feet.)

M 14.—About 500 feet south of **Willsburg**, Clackamas County, on the Southern Pacific Railroad, at the southeast end of bridge 765 C over Johnson Creek, on the retaining wall. A brass disk. (17.936 meters or 58.845 feet.)

N 14.—About $\frac{1}{4}$ mile north of **Willsburg**, Clackamas County, on the Southern Pacific Railroad, 35 feet west of the main track, in the vertical face of the abutment of the Portland Electric Power Co.'s overhead crossing. A brass disk. (17.217 meters or 56.486 feet.)

O 14.—At **Portland**, Multnomah County, 0.5 mile south of the Union Depot, on the steel bridge of the Southern Pacific and joint lines over the Willamette River, on the southwest end of the retaining wall at the south side of east end of bridge. A brass disk. (9.963 meters or 32.687 feet.)

Portland City B. M. No. 31.—At **Portland**, Multnomah County, on the west abutment of the steel bridge over the Willamette River, 60 feet west of Front Street, near the northeast corner of the wall in the east face of the concrete, 20 feet south of a spur track leading to the Union Station. A bronze tablet stamped "City of Portland, Class A, Bench Mark No. 31." (9.425 meters or 30.922 feet.) This bench mark should be used with caution as it is believed that the abutment in which it is embedded has been sinking.

Q 14.—At **Portland**, Multnomah County, in the southwest corner of the Union Station Park, at the corner of the station building. A stone post with disk in top. (9.502 meters or 31.174 feet.)

R 14.—At **Portland**, Multnomah County, at the main entrance to the custom-house, at the left end of the first step, about 4 inches from the wall. A brass disk. (9.173 meters or 30.095 feet.)

S 14 (U. S. G. S.).—At **Portland**, Multnomah County, on the north front or Morrison Street entrance of the old post office, 2 feet east of the doorway, on

the first course of stone above the water table. An aluminum tablet stamped "54 A." (16.596 meters or 54.449 feet.)

U. S. G. S. 29.—At **Portland**, Multnomah County, a copper bolt in the extreme southwest corner of the top of the masonry pier at the east end of what was formerly the location of the old steel bridge. This pier is on the east bank of the Willamette River about 75 feet west of the foot of Holladay Avenue and about 50 feet west of the railroad tracks. (9.541 meters or 31.302 feet.) This bench mark was connected by the Pacific Power & Light Co.

T 14 (U. S. G. S.)—At **Portland**, Multnomah County, at the city hall, in the stone base of the center pillar of the Fifth Street entrance. A bronze tablet stamped "75." (23.384 meters or 76.719 feet.)

U 14.—About 3 miles north of **Portland**, Multnomah County, on the Spokane, Portland & Seattle Railway, 35 feet south of a road, and east of the track. A concrete post with disk in top. (9.569 meters or 31.394 feet.)

V 14.—About 4¼ miles north of **Portland**, Multnomah County, on the Spokane, Portland & Seattle Railway, just south of milepost 4, 50 feet east of the track and 150 feet east of the Columbia River Highway, 35 feet south of the driveway into the Union Oil Co. plant, in the top of a concrete retaining wall immediately over the third buttress from the north end. A brass disk. (11.581 meters or 37.995 feet.)

B 32 (U. S. G. S.)—About ¼ miles southerly from **East St. Johns**, Multnomah County, near the easterly bank of the Willamette River, on the Spokane, Portland & Seattle Railway bridge over the tracks of the Oregon-Washington Railroad & Navigation Co., in the westerly abutment. A metal tablet stamped "62." (18.587 meters or 60.981 feet.)

C 32.—At **East St. Johns**, Multnomah County, 260 feet south of the Spokane, Portland & Seattle Railway depot, in the south end of the center pier of the viaduct. A brass disk. (18.868 meters or 61.903 feet.)

Portland City B. M. 1233.—About ½ mile north of **East St. Johns**, Multnomah County, on the southwest abutment of the Spokane, Portland & Seattle Railway bridge over Columbia Slough. A metal disk marked "City of Portland, Class A, B. M. No. 1233." (13.575 meters or 44.537 feet.) The abutment is reported to have settled perceptibly and the bench mark should be used with caution.

D 32.—About 1¼ miles north of **East St. Johns**, Multnomah County, on the Spokane, Portland & Seattle Railway, in the southwest abutment of the bridge over North Portland Harbor. A brass disk. (14.398 meters or 47.237 feet.)

LINE VII, PORTLAND TO ASTORIA, OREG.

This line follows the Spokane, Portland & Seattle Railway from **Portland** through **Astoria** to **Fort Stevens, Oreg.** The field work was done between July 15 and August 14, 1920, by **J. D. Crichton**, junior hydrographic and geodetic engineer, assisted by **H. C. Warwick**, junior hydrographic and geodetic engineer, who operated a subparty.

For bench marks at **Portland**, see pages 57, 63.

Portland City B. M. 1286.—At **Oilton**, Multnomah County, in the northwest corner of the Standard Oil Co. building, facing the Spokane, Portland & Seattle Railway tracks and the Columbia River Highway, and just south of the driveway leading into the plant. A brass disk marked "City of Portland B. M. 1286." (11.367 meters or 37.293 feet.)

W 14.—At **Gasco**, Multnomah County, on the Spokane, Portland & Seattle Railway, just south of the driveway crossing leading to the Portland Gas & Coke Co. plant and 12 feet west of the track, in the base of a warning bell. A brass disk. (11.120 meters or 36.483 feet.)

Portland City B. M. 1290.—At **Gasco**, Multnomah County, on the east side of the Columbia River Highway, in the base of an ornamental lamp-post in the first bend in the concrete driveway leading to the Portland Gas & Coke Co. plant. A brass disk marked "City of Portland B. M. 1290." (15.179 meters or 49.800 feet.) The connection with this bench mark was made by the Pacific Power & Light Co.

U. S. G. S. 34.7.—At **Gasco**, Multnomah County, on the grounds of the Portland Gas & Coke Co. plant in the southwest corner of the concrete holder pit in front of the gas holder and just north of the main office. A U. S. G. S.

copper nail embedded in cement. (10.582 meters or 34.717 feet.) The connection with this bench mark was made by the Pacific Power & Light Co.

X 14 (U. S. G. S.).—At Linnton, Multnomah County, on the Spokane, Portland & Seattle Railway, 210 feet south of the depot, 55 feet east of the track and 10 feet south of O Street. An iron post stamped "40 A." (12.355 meters or 40.535 feet.)

Portland City B. M. 1293.—At Linnton, Multnomah County, in the north end of the west curb at the southwest corner of Second and F Streets. A brass tablet marked "City of Portland B. M. 1293." (14.048 meters or 46.088 feet.) The connection with this bench mark was made by the Pacific Power & Light Co.

City of Portland B. M. 1294.—At Linnton, Multnomah County, about $\frac{1}{2}$ mile north of C Street, 35 feet west of the Columbia River Highway, in the top of a granite milepost, marked "P 9," on a bank about 8 feet above the highway level. A brass tablet marked "City of Portland B. M. 1294." (18.806 meters or 61.698 feet.) The connection with this bench mark was made by the Pacific Power & Light Co.

Portland City B. M. 1295.—Near Linnton, Multnomah County, about 1 mile north of C Street, 28 feet west of the Columbia River Highway and about 40 feet southwest of the crossing with the United Railways. An iron post stamped "City of Portland B. M. 1295." (18.757 meters or 61.539 feet.) The connection with this bench mark was made by the Pacific Power & Light Co. by a single line of levels.

Y 14.—About $1\frac{1}{2}$ miles north of Linnton, Multnomah County, on the Spokane, Portland & Seattle Railway, at mileage 8.8, 15 feet west of track. A concrete post with disk in top. (10.320 meters or 33.858 feet.)

Z 14 (U. S. G. S.).—At Holbrook, Multnomah County, on the Spokane, Portland & Seattle Railway, 100 feet northwest of depot, 120 feet west of the main track, 60 feet south of a switch stand and 40 feet east of center line of the Columbia River Highway, in a garden, at the northwest corner of a chicken house. An iron post stamped "35 A." (10.715 meters or 35.154 feet.)

A 30.—About $2\frac{1}{2}$ miles north of Holbrook, Multnomah County, on the Spokane, Portland & Seattle Railway, in the northeast abutment of culvert A 15-3. A brass disk. (9.084 meters or 31.772 feet.)

B 30.—At Rocky Point, Multnomah County, on the Spokane, Portland & Seattle Railway, in the southeast corner of the concrete base of the water tank. A railroad spike. (10.327 meters or 33.881 feet.)

78 B (U. S. G. S.).—At Rocky Point, Multnomah County, about 100 feet northwest of the junction of the Rocky Point Road and the Columbia River Highway. An iron post with brass cap stamped "Primary Traverse Station No. 11, 78 1914 B." (25.259 meters or 82.872 feet.) The connection with this bench mark was made by Robert Bonser, Multnomah County engineer.

B. M. Square.—At Rocky Point, Multnomah County, on the west side of the Columbia River Highway just south of the intersection of the Rocky Point Road. An outlined square in the northeast corner of the concrete base of the highway sign. (23.390 meters or 76.739 feet.) The connection with this bench mark was made by the Pacific Power & Light Co.

C 30.—About 3 miles south of Scappoose, Columbia County, on the Spokane, Portland & Seattle Railway, on the northeast abutment of culvert A 16-9. A brass disk. (9.654 meters or 31.673 feet.)

D 30 (U. S. G. S.).—At Scappoose, Columbia County, 100 feet southeast of the Spokane, Portland & Seattle Railway depot, 90 feet east of the track, 20 feet south of the road crossing the track, and 200 feet east of the Columbia River Highway. An iron post stamped "61 A." (18.583 meters or 60.968 feet.)

F 30.—About $2\frac{1}{4}$ miles north of Scappoose, Columbia County, on the Spokane, Portland & Seattle Railway, 800 feet north of Honeyman station, in the northeast concrete abutment of steel bridge A 22-2, opposite Columbia River Highway mileage 23.5. A brass disk. (15.139 meters or 49.669 feet.)

G 30 (U. S. G. S.).—At Warren, Columbia County, on the Spokane, Portland & Seattle Railway, 90 feet northeast of the depot, 80 feet east of the track, in the east line of the county road, 300 feet north of the post office. An iron post stamped "48 A." (14.745 meters or 48.376 feet.)

H 30.—At McNulty, Columbia County, about $1\frac{1}{2}$ miles south of St. Helens, on the Spokane, Portland & Seattle Railway, 35 feet south of the depot, 25 feet west of the track and 15 feet north of a road turning east from the

Columbia River Highway. A concrete post with disk in top. (19,683 meters or 64,577 feet.)

U. S. G. S. 98.6.—At **St. Helens**, Columbia County, on the Columbia River Highway, 700 feet south of the main highway and county road intersection, at the northeast corner of the concrete bridge over Milton Creek. A U. S. G. S. brass tablet stamped "98.6." (30,058 meters or 98,614 feet.) The connection with this bench mark was made by the Pacific Power & Light Co.

I 30 (U. S. G. S.).—At **St. Helens**, Columbia County, on the Spokane, Portland & Seattle Railway, 210 feet south of the depot, 6 feet east of the Columbia River Highway pavement, 60 feet west of the track, 60 feet south of the intersection of the highway and a county road at right angles, and immediately south of the second large tree south of this intersection. An iron post stamped "99 A." (30,152 meters or 98,924 feet.)

Square.—At **St. Helens**, Columbia County, on the Spokane, Portland & Seattle Railway, about 200 feet south of the depot, 12 feet west of the track, on the southwest corner of the concrete base of the warning bell just south of the main road crossing. An outlined square. (31,548 meters or 103,505 feet.) The connection with this bench mark was made by the Pacific Power & Light Co.

N 30.—About $\frac{1}{2}$ mile north of **St. Helens**, Columbia County, on the Spokane, Portland & Seattle Railway, 65 feet west of the track, 25 feet west of the Columbia River Highway, and 50 feet east of a tea house, in an arbor. A brass disk cemented in top of a cast-iron sewer pipe set on end. (35,823 meters or 117,529 feet.)

J 30 (U. S. G. S.).—About $3\frac{1}{4}$ miles north of **St. Helens**, Columbia County, on the Spokane, Portland & Seattle Railway, 0.6 of a mile south of **Waterview**, and $\frac{1}{4}$ mile north of an old tower, 50 feet west of the county road, and 80 feet east of the track. An iron post stamped "78 A." (23,705 meters or 77,772 feet.)

K 30.—At **Deer Island**, Columbia County, on the Spokane, Portland & Seattle Railway, 50 feet west of the track, 130 feet east of Columbia River Highway, 260 feet south of the depot, directly behind J. Gaitten's woodshed, opposite the first road crossing south of the depot platform. A concrete post with disk in top. (14,658 meters or 48,090 feet.)

L 30.—About $1\frac{1}{4}$ miles north of **Deer Island**, Columbia County, on the Spokane, Portland & Seattle Railway, in the northeast abutment of culvert A 34-4. A brass disk. (8,941 meters or 29,334 feet.)

M 30.—About $3\frac{1}{2}$ miles north of **Deer Island**, Columbia County, and just north of **Charlton** on the Spokane, Portland & Seattle Railway on the high point of the largest rock in a pile opposite the middle promontory of the cliff west of the track. An outlined square. (6,200 meters or 20,341 feet.)

O 30 (U. S. E.).—About $\frac{1}{2}$ mile south of **Goble**, Columbia County, 50 feet west of the Spokane, Portland & Seattle Railway, 60 feet north of the northeast corner of the Shell Co. oil warehouse, 150 feet east of the Columbia River Highway, about 20 feet north of a road leading east from the Columbia River Highway, and 40 feet southeast of the base of a rock knoll. A concrete post marked "U. S. E. B. M." with a brass rod in the top. (9,171 meters or 30,089 feet.)

P 30.—At **Goble**, Columbia County, 80 feet westerly from the Spokane, Portland & Seattle Railway track, 80 feet southeast of the post office, at the south-westerly corner of the intersection of the Columbia River Highway and a county road, in solid rock at the base of the cliff. A brass disk. (9,135 meters or 29,970 feet.)

U. S. G. S. 31.3.—At **Goble**, Columbia County, about 630 feet north of the post office and 690 feet north of the intersection of the Columbia River Highway and a county road, in the west right-of-way line of Columbia River Highway, at the south gatepost at a private road to a farm. An iron post stamped "31.3." (9,598 meters or 31,489 feet.) The connection with this bench mark was made by the Oregon Geographic Board.

O. S. H. D. 23.—At **Goble**, Columbia County, about 1,000 feet north of the post office and in the southeast corner of the Columbia River Highway concrete bridge over Goble Creek. A bronze tablet of the Oregon State Highway Department stamped "23." (7,007 meters or 22,989 feet.) The connection with this bench mark was made by the Oregon State Highway Department.

Q 30.—About 1 mile west of **Prescott**, Columbia County, on the Spokane, Portland & Seattle Railway, in the northeast abutment of the water tank at **Oasis**. A brass disk. (6,478 meters or 21,253 feet.)

Z 30 (City).—At **Rainier**, Columbia County, at the southeast intersection of Quincy and Water Streets, in the sidewalk 15 feet from the curbing. A brass rivet set by the city engineering department. (7.062 meters or 23.169 feet.)

R 30.—At **Rainier**, Columbia County, on the south side of the street directly north of the Spokane, Portland & Seattle Railway depot, in the curbing in front of the ticket office. A brass disk. (6.949 meters or 22.799 feet.)

S 30.—About 1 mile west of **Rainier**, Columbia County, on the Spokane, Portland & Seattle Railway, 50 feet east of the turntable at Avon, 25 feet south of the track, between the siding and the spur line to the turntable. A concrete post with disk in top. (6.476 meters or 21.247 feet.)

T 30.—About $\frac{1}{2}$ mile west of **Tryon**, Columbia County, on the Spokane, Portland & Seattle Railway, at mileage 51.9, at the west end of the first cut west of the depot, and 15 feet south of the track. A concrete post with disk in top. (6.294 meters or 20.650 feet.)

U 30.—About $\frac{1}{4}$ mile west of **Pyramid**, Columbia County, on the Spokane, Portland & Seattle Railway, 15 feet north of the track, on the first small promontory west of the depot. A concrete post with disk in top. (5.644 meters or 18.517 feet.)

V 30 (U. S. G. S.).—At **Mayger**, Columbia County, on the Spokane, Portland & Seattle Railway, 250 feet southwest of the depot, 200 feet south of the track, and 35 feet south of the southwest corner of a house. An iron post stamped "18 A." (5.561 meters or 18.245 feet.)

W 30.—About $1\frac{1}{2}$ miles west of **Mayger**, Columbia County, on the Spokane, Portland & Seattle Railway, 65 feet south of the west end of culvert A 57.2, at the foot of the cliff in the northwest corner of the intersection of two public roads. A concrete post with disk in top. (4.828 meters or 15.840 feet.)

X 30.—About $\frac{3}{4}$ mile east of **Quincy**, Columbia County, on the Spokane, Portland & Seattle Railway, in the northwest abutment of a water tank. A brass disk. (5.389 meters or 17.680 feet.)

Y 30 (U. S. G. S.).—About 500 feet east of **Quincy**, Columbia County, on the Spokane, Portland & Seattle Railway, 200 feet south of the track, at culvert post A 59.16. An iron post stamped "18 A." (5.729 meters or 18.796 feet.)

Z 31 (U. S. G. S.).—At **Clatskanie**, Columbia County, on the Spokane, Portland & Seattle Railway, 140 feet east of the depot, 70 feet south of the main-line track, and 170 feet north of the Columbia River Highway. An iron post stamped "23 A." (7.009 meters or 22.995 feet.)

Y 31 (U. S. G. S.).—At **Marshland**, Columbia County, on the Spokane, Portland & Seattle Railway, 75 feet southwest of the depot, 40 feet south of the track, and 8 feet west of the road. An iron post stamped "15 A." (4.689 meters or 15.384 feet.)

X 31.—At **Woodson**, Columbia County, 500 feet south of the Spokane, Portland & Seattle Railway depot, 15 feet south of the Columbia River Highway just west of its intersection with the public road from the depot, and 100 feet west of highway milepost 72. A concrete post with disk in top. (3.693 meters or 12.116 feet.)

W 31.—At **Kerry**, Columbia County, on the Spokane, Portland & Seattle Railway, 400 feet west of the depot and 15 feet north of the track. A concrete post with disk in top. (3.556 meters or 11.667 feet.)

V 31.—At **Westport**, Clatsop County, 500 feet southeast of the Spokane, Portland & Seattle Railway, on the concrete railing of the concrete bridge of the Columbia River Highway over Plympton Creek, in the northeast end. A brass disk. (9.734 meters or 31.936 feet.)

O 31 (U. S. G. S.).—At **Westport**, Clatsop County, 200 feet south of the Spokane, Portland & Seattle Railway depot, 70 feet south of the track, 40 feet east of the water's edge in Plympton Creek, and 60 feet west of a road. An iron post stamped "20 A." (6.284 meters or 20.617 feet.)

T 31.—About $\frac{1}{3}$ mile east of **Wauna**, Clatsop County, on the Spokane, Portland & Seattle Railway, in a rock cut, south of and about $4\frac{1}{2}$ feet above the track, in outcropping rock. A brass disk. (4.754 meters or 15.597 feet.)

Triangulation Station "Bugby Hole Eccentric."—At **Bugby**, Clatsop County, on the Spokane, Portland & Seattle Railway, 650 feet north of Bugby Hole Creek, and five rails north of a trestle. The highest point or inshore edge of the triangulation station, consisting of a standard disk station mark set in an irregular pier of concrete. (3.543 meters or 11.624 feet.)

M 31 (U. S. G. S.).—At **Clifton**, Clatsop County, on the Spokane, Portland & Seattle Railway, 80 feet northeast of the depot, 70 feet north of the track,

and 80 feet south of the river. An iron post stamped "8 A." (2.671 meters or 8.763 feet.)

L 31.—About $\frac{1}{4}$ mile east of the depot at Aldrich Point, Clatsop County, on the Spokane, Portland & Seattle Railway, 8 feet south of the track, in a sandstone boulder about 9 feet in diameter. A brass disk. (3.709 meters or 12.169 feet.)

K 31 (U. S. G. S.).—At Knappa, Clatsop County, 130 feet north of the Spokane, Portland & Seattle Railway depot, 500 feet south of the Knappa Hotel, 50 feet west of a north-south road, 1 foot west and 6 feet south of northwest corner of small garage, 15 inches below the surface. An iron post stamped "9 A." (2.791 meters or 9.157 feet.)

J 31.—At Knappa, Clatsop County, on the Spokane, Portland & Seattle Railway, 15 feet south of the track and 22 feet east of a road crossing the track at the depot. A concrete post with disk in top. (3.544 meters or 11.627 feet.)

P 31 (U. S. G. S.).—At Svensen, Clatsop County, on the Spokane, Portland & Seattle Railway, 85 feet south of the depot and post office, and 5 feet west of a north-south road. An iron post stamped "8 A." Having been found loose, the bench mark was reset firmly. (2.719 meters or 8.921 feet.)

I 31.—About $\frac{1}{2}$ mile east of John Day, Clatsop County, on the Spokane, Portland & Seattle Railway, at the east end of a short deep cut near the drawbridge over John Day River, and 20 feet south of the track. A concrete post with disk in top. (3.250 meters or 10.663 feet.)

P 5.—About 2 miles south of Astoria, Clatsop County, at Miles Crossing, on top of the south side of concrete curb around flower bed in center of highway intersection. A bronze tablet stamped "P 5." (2.343 meters or 7.687 feet.) This bench mark was established by the Pacific Power & Light Co.

P 4.—At Astoria, Clatsop County, at the Coast Highway bridge over Youngs Bay, in concrete walk, between post and curb, at east side of north end. A bronze tablet stamped "P 4." (9.863 meters or 32.359 feet.) This bench mark was established by the Pacific Power & Light Co.

P 3.—At Astoria, Clatsop County, at the Youngs Bay plant of the Pacific Power & Light Co., on top of post at west end of concrete and brick wall, north of operator's cottage. A bronze tablet stamped "P 3." (4.035 meters or 13.239 feet.) This bench mark was established by the Pacific Power & Light Co. Reported to have settled; use with caution.

P 2.—At Astoria, Clatsop County, at the Youngs Bay plant of the Pacific Power & Light Co., in top of north concrete footing of water tower. A bronze tablet stamped "P 2." (3.556 meters or 11.667 feet.) This bench mark was established by the Pacific Power & Light Co.

P 1.—At Astoria, Clatsop County, on the south side of the Youngs Bay plant of the Pacific Power & Light Co., on east face of concrete condenser intake. A bronze tablet stamped "P 1," set vertically. (3.633 meters or 11.919 feet.) This bench mark was established by the Pacific Power & Light Co.

H 31.—At Astoria, Clatsop County, on the southwest corner of the intersection of Forty-fifth and Astor Streets, 35 feet from the edge of the river bank, 1 foot inside the concrete curb. A concrete post with disk in top. (5.968 meters or 19.580 feet.)

G 31.—At Astoria, Clatsop County, in the city park at the reservoir, on the west buttress at the north entrance to the waterworks building. A brass disk. (86.368 meters or 283.359 feet.)

F 31.—At Astoria, Clatsop County, at the front entrance to the Clatsop County courthouse, on the east end of the first step. A brass disk. (5.720 meters or 18.766 feet.)

E 31.—At Astoria, Clatsop County, in front of the Port of Astoria office building, in the west side of the terrace, 1 foot inside the curbing. A concrete post with disk in top. (3.761 meters or 12.339 feet.)

U 31 (City B. M.).—At Astoria, Clatsop County, the bench mark of origin for the city, at the southeast corner of the customhouse and post office, consisting of the highest nub of rough cut stone forming the base of the iron railing. (5.044 meters or 16.548 feet.)

A 32 (U. S. E. A-1).—At Astoria, Clatsop County, on the southeast corner of the customhouse and post office, in the water table. A chiseled cross lettered "B. M. U. S. E." (5.415 meters or 17.766 feet.)

D 31.—At Astoria, Clatsop County, in the southwest pier of the State Highway viaduct over the Youngs Bay belt line railroad of the Port of Astoria, 3 feet above the track. A brass disk. (3.248 meters or 10.656 feet.)

C 31.—At Warrenton, Clatsop County, in the first concrete step leading from the street to F. M. Wilson's drug store, opposite the Spokane, Portland & Seattle Railway depot. A brass disk. (1.562 meters or 5.125 feet.)

B 31.—At Flavel, Clatsop County, near the northern end of the riprap extending from the shore to the Del Monte Cannery wharf, in the concrete pier forming the base of an elevated water tank. A brass disk. (3.481 meters or 11.421 feet.)

A 31.—At Hammond, Clatsop County, on the Spokane, Portland & Seattle Railway, 300 feet south of the depot, 12 feet west of the track, at the most northern point at which the right of way is close to the river's edge. A concrete post with disk in top. (3.392 meters or 11.129 feet.)

Q 31.—At Fort Stevens, Clatsop County, in Battery Clark, at the rear of Pit A, about 50 feet in rear of battery floor, directly in rear of letter "A" in word "Pit A." A stone post with copper bolt in top. (3.642 meters or 11.949 feet.)

R 31 (U. S. E.).—At Fort Stevens, Clatsop County, 12 feet from the middle of the west side of the power house. A stone post with copper bolt in top. (4.137 meters or 13.573 feet.)

S 31 (U. S. E. A-3).—At Fort Stevens, Clatsop County, 12 feet from the southwest leg and 20 feet from the southeast leg of the meteorological tower, and 8 feet from the edge of the concrete floor. A brass plug set in a tile filled with concrete. (5.861 meters or 19.230 feet.)

LINE VIII, PORTLAND, OREG., TO WALLULA, WASH. (PART)

This is the Oregon portion of a line which follows the tracks of the Oregon-Washington Railroad & Navigation Co. from Portland, Oreg., to Wallula, Wash. For a greater part of the distance from Portland to Umatilla the Columbia River Highway closely parallels the railroad tracks, and in most instances the bench marks are readily accessible from the highway. The field work was done by J. D. Crichton, junior hydrographic and geodetic engineer, between July 8, and November 5, 1921.

For additional bench marks at Portland, see pages 57, 58.

K 23.—At Portland, Multnomah County, in the west end of the south concrete wall of Sandy Boulevard viaduct over the Oregon-Washington Railroad & Navigation Co. tracks, 4 feet above the rail. A brass disk. (40.294 meters or 132.108 feet.)

L 23.—At Portland, Multnomah County, at Montavilla station, in the west end of the south concrete wall of the East Eighty-second Street viaduct over the Oregon-Washington Railroad & Navigation Co. tracks and 4 feet above the rail. A brass disk. (67.364 meters or 221.010 feet.)

M 23.—At Portland, Multnomah County, at Barr Road Crossing, 10 feet east of the crossing bell, and 18 feet north of the Oregon-Washington Railroad & Navigation Co. track. A concrete post with disk in top. (65.321 meters or 214.307 feet.)

T 23 (U. S. G. S.).—At Portland, Multnomah County, at Clarnie siding, 15 feet east of a private road crossing and 25 feet north of the Oregon-Washington Railroad & Navigation Co. tracks. An iron post stamped "205 A." (62.537 meters or 205.173 feet.)

N 23.—About 8 miles east of Portland, Multnomah County, at the crossing of County Road 110 (Buckley Avenue) 20 feet north of the Oregon-Washington Railroad & Navigation Co. tracks, 6 feet west of the fence at the edge of the road. A concrete post with disk in top. (63.926 meters or 209.731 feet.)

O 23.—About 11 miles east of Portland, Multnomah County, at the crossing of County Road 560 (Rockwood Road) 13 feet north of the Oregon-Washington Railroad & Navigation Co. tracks, 10 feet west of the fence at the east edge of the road. A concrete post with disk in top. (46.935 meters or 153.986 feet.)

R 23 (U. S. G. S.).—At Fairview, Multnomah County, 150 feet west of road, 130 feet south of the Oregon-Washington Railroad & Navigation Co. tracks, in fenced-in yard in rear of house adjoining the railroad right of way. An iron post stamped "114 A." (34.775 meters or 114.091 feet.)

P 23.—At Fairview, Multnomah County, east of the Oregon-Washington Railroad & Navigation Co. depot in the north concrete coping of the west end of railroad bridge over a road. A brass disk. (33.798 meters or 110.886 feet.)

Q 23.—At Troutdale, Multnomah County, east of the Oregon-Washington Railroad & Navigation Co. depot in the top of the west abutment of the south end of steel railroad bridge over Sandy River. A brass disk. (14.468 meters or 47.467 feet.)

41 A (U. S. G. S.).—At Troutdale, Multnomah County, under the Oregon-Washington Railroad & Navigation Co. right-of-way fence approximately 75 feet north and 4 feet west of the northeast corner of the depot. An iron pipe. (12.777 meters or 41.919 feet.) This bench mark was connected by the Pacific Power & Light Co.

S 23.—About 2½ miles east of Troutdale, Multnomah County, in the south end of a concrete culvert. A brass disk. (12.197 meters or 40.016 feet.)

X 23 (U. S. G. S.).—At Corbett, Multnomah County, 30 feet west of the post office and 60 feet south of the Oregon-Washington Railroad & Navigation Co. track at the east end of the depot. An iron post stamped "46 A." (14.096 meters or 46.247 feet.)

U 23.—At Corbett, Multnomah County, 1,400 feet east of the Oregon-Washington Railroad & Navigation Co. depot in the top of the south end of a concrete culvert. A brass disk. (12.469 meters or 40.909 feet.)

V 23 (U. S. G. S.).—At Latourell, Multnomah County, 50 feet south of the depot, 100 feet south of the track, 59 feet north of road, 80 feet north of post office, 10 feet east of sidewalk, and 25 feet east of road. An iron post stamped "57 A." (17.682 meters or 58.012 feet.)

W 23.—At Bridal Veil, Multnomah County, in the top of the north end of the east abutment of the Oregon-Washington Railroad & Navigation Co. bridge over Bridal Veil Creek. A brass disk. (12.797 meters or 41.985 feet.)

Y 23 (U. S. G. S.).—At Multnomah Falls, Multnomah County, 320 feet north of the base of the falls, 150 feet south of the Oregon-Washington Railroad & Navigation Co. tracks, 100 feet west of Multnomah Creek, 8 feet west of a trail leading to the falls and Larch Mountain, and 4 feet south of automobile parking space. An iron post stamped "46 A." (15.272 meters or 50.105 feet.)

County B. M. S. W.—At Multnomah Falls, Multnomah County, in the top of the concrete post in the masonry wall on the west bank of Multnomah Creek near the southwest corner of the Columbia River Highway bridge. A brass screw. (14.010 meters or 45.966 feet.) The connection with this bench mark was made by the Pacific Power & Light Co.

County B. M. N. W.—At Multnomah Falls, Multnomah County, in the top of the concrete post in the masonry wall on the west bank of Multnomah Creek near the northwest corner of the Columbia Highway bridge. A brass screw. (14.067 meters or 46.153 feet.) The connection with this bench mark was made by the Pacific Power & Light Co.

Railroad B. M.—At Multnomah Falls, Multnomah County, on the south lower step of the west concrete abutment of the Oregon-Washington Railroad & Navigation Co. bridge 29.65 over Multnomah Creek, about 75 feet north of the Columbia River Highway. A concrete point in a chiseled circle. A railroad bench mark. (12.799 meters or 41.992 feet.) The connection with this bench mark was made by the Pacific Power & Light Co.

Z 23.—At Horsetail Falls, Multnomah County, in the top of the west concrete abutment of the Oregon-Washington Railroad & Navigation Co. bridge over Horsetail Creek. A brass disk. (12.830 meters or 42.093 feet.)

A 24.—At Dodson, Multnomah County, 50 feet southwest of the Oregon-Washington Railroad & Navigation Co. depot, 40 feet south of the tracks, and 1 foot north of the right-of-way fence. A concrete post with disk in top. (18.861 meters or 61.880 feet.)

77 A (U. S. G. S.).—About 2,000 feet westerly from Warrendale, Multnomah County, 75 feet south of the main-line track of the Oregon-Washington Railroad & Navigation Co., 150 feet southwest from an old stone foundation and about 100 feet southeast from a gate in the railroad right-of-way fence. An iron post stamped "77 A." (23.687 meters or 77.714 feet.) The connection with this bench mark was made by the Pacific Power & Light Co.

B 24.—About 1 mile east of Warrendale, Multnomah County, along the Oregon-Washington Railroad & Navigation Co. track, in the north end, top face, of a concrete culvert. A brass disk. (22.007 meters or 72.201 feet.)

C 24 (U. S. G. S.).—At **Bonneville**, Multnomah County, 75 feet southeast of the Oregon-Washington Railroad & Navigation Co. depot, 200 feet northwest of dancing pavillon in park, 250 feet south of hotel and 130 feet south of the track. An iron post stamped "53 A." (13.266 meters or 53.366 feet.)

D 24.—About $2\frac{1}{2}$ miles west of **Cascade Locks**, Hood River County, 400 feet west of Ruckel Creek and 60 feet south of the Oregon-Washington Railroad & Navigation Co. track. A brass disk set in a granite boulder. (23.902 meters or 78.418 feet.)

E 24 (U. S. G. S.).—At **Cascade Locks**, Hood River County, 330 feet northeast of the post office, 400 feet northwest of the Oregon-Washington Railroad & Navigation Co. depot, 80 feet south of engineer's office on Government reservation, and 30 feet north of the track. An iron post stamped "99 A." (30.260 meters or 99.278 feet.)

M 24.—At **Cascade Locks**, Hood River County, in the northeast corner of coping of upper lock gate, north side, and 20 feet north of upper river water gauge No. 1. A brass disk. (22.920 meters or 75.197 feet.)

F 24.—About $1\frac{3}{4}$ miles east of **Cascade Locks**, Hood River County, in the top of the south end of west concrete abutment of the Oregon-Washington Railroad & Navigation Co. bridge over Herman Creek. A brass disk. (37.363 meters or 122.582 feet.)

FX 24.—About $1\frac{3}{4}$ miles east of **Cascade Locks**, Hood River County, in the south curb at the west end of the Columbia River Highway concrete bridge over Herman Creek. A chiseled square. (33.978 meters or 111.476 feet.) This bench mark was established by the Pacific Power & Light Co. It is planned to establish an Oregon State bronze tablet at this point with exactly the same elevation.

G 24.—About 5 miles east of **Cascade Locks**, Hood River County, 400 feet east of milepost 48 of the Oregon-Washington Railroad & Navigation Co., in the face of a cliff at the south edge of railroad right of way and $1\frac{1}{2}$ feet above the rail. A brass disk. (28.702 meters or 94.166 feet.)

H 24.—At **Wyeth**, Hood River County, in the northeast corner of the fenced-in yard in the rear of the Oregon-Washington Railroad & Navigation Co. depot. A concrete post with disk in top. (29.893 meters or 98.074 feet.)

R 24 (U. S. G. S.).—About $\frac{1}{3}$ mile east of **Wyeth**, Hood River County, 49 feet west of the section house and 25 feet south of the Oregon-Washington Railroad & Navigation Co. tracks. An iron post stamped "97 A." (29.741 meters or 97.575 feet.)

I 24.—About $1\frac{1}{2}$ miles east of **Wyeth**, Hood River County, 28 feet south of the Oregon-Washington Railroad & Navigation Co. tracks, 16 feet north of the Columbia River Highway, 350 feet east of highway mile post 54, 200 feet west of the west end of the retaining wall between highway and Shell-rock Mountain and 30 feet east of semaphore 512. A concrete post with disk in top. (30.468 meters or 99.960 feet.)

J 24.—About 2 miles west of **Viento**, Hood River County, near east end of Lindsey siding, in the west abutment, north top face of a small concrete bridge on the Columbia River Highway. A brass disk. (31.826 meters or 104.416 feet.)

L 24 (U. S. G. S.).—At **Viento**, Hood River County, 100 feet southeast of the Oregon-Washington Railroad & Navigation Co. depot, 6 feet east of gate in south right-of-way fence. An iron post stamped "103 A." This bench mark was reset. (31.285 meters or 102.641 feet.)

K 24.—About $3\frac{3}{4}$ miles east of **Viento**, Hood River County, 300 feet east of milepost 56 of the Oregon-Washington Railroad & Navigation Co., at the west end of a shallow rock cut. A brass disk set in bedrock at the south edge of the right of way. (29.266 meters or 96.017 feet.)

N 24.—About $3\frac{1}{2}$ miles west of **Hood River**, Hood River County, $\frac{1}{2}$ mile west of overhead road crossing, at the south edge of the Oregon-Washington Railroad & Navigation Co. right of way. A brass disk set in the face of a cliff. (36.160 meters or 118.635 feet.)

O 24.—At **Hood River**, Hood River County, in the concrete head wall at the foot of Second Street. A brass disk. (35.298 meters or 115.807 feet.)

P 24 (U. S. G. S.).—At **Hood River**, Hood River County, in the park adjoining the west end of the Oregon-Washington Railroad & Navigation Co. depot. An iron post stamped "103 A," set in concrete. (30.889 meters or 101.342 feet.)

Q 24.—At **Hood River**, Hood River County, in the southwest concrete abutment of the Oregon-Washington Railroad & Navigation Co. bridge over Hood River. A brass disk. (30.510 meters or 100.098 feet.)

Magnetic.—At **Hood River**, Hood River County, on the south side of State Street, in the east side of the Hood River County courthouse yard, near the band stand. A bronze disk marking a magnetic station set in the top of a concrete monument. The connection with this bench mark was made by the Pacific Power & Light Co. (62.470 meters or 204.953 feet.)

City Bench Mark.—At **Hood River**, Hood River County, on the east side of Second Street, at the northwest corner of the iron step of the first entrance to the red brick building north of the fire station at the city hall. A punch marked cross and "B. M." The connection with this bench mark was made by the Pacific Power & Light Co. (46.497 meters or 152.549 feet.)

State Highway Bench Mark.—About 0.4 mile east of **Hood River**, Hood River County, on the concrete curb 3 inches from southwest corner of the Columbia River Highway bridge over Hood River. A copper bolt. The connection with this bench mark was made by the Pacific Power & Light Co. (34.243 meters or 112.345 feet.)

M 31.—At **Powerdale**, about $\frac{1}{2}$ mile southeast from **Hood River**, Hood River County, at the northwest corner of the Pacific Power & Light Co. Powerdale plant. A concrete post with a United States Geological Survey aluminum tablet stamped "M 31." This bench mark was established by the Pacific Power & Light Co. from bench mark P 24. (31.212 meters or 102.403 feet.)

M 21.—About 0.5 mile east of **Hood River**, Hood River County, in the south curb at the east end of the Columbia River Highway concrete bridge over Hood River. A United States Geological Survey tablet stamped "M 21." This bench mark was established by the Pacific Power & Light Co. from bench mark P 24. (32.957 meters or 108.127 feet.)

S 24.—About $3\frac{1}{2}$ miles east of **Hood River**, Hood River County, in the concrete base of what was formerly a telltale, on the north side of the Oregon-Washington Railroad & Navigation Co. track, and 200 feet west of tunnel $1\frac{1}{2}$. A brass disk. (29.179 meters or 95.731 feet.)

T 24.—At **Mosier**, Wasco County, in the top of the southwest concrete abutment of the Oregon-Washington Railroad & Navigation Co. steel bridge over Mosier Creek. A brass disk. (29.471 meters or 96.689 feet.)

M 29.—At **Mosier**, Wasco County, in the concrete curbing at the northwest corner of the Columbia River Highway bridge over Mosier Creek. A United States Geological Survey brass tablet stamped "111.8." This bench mark was established by the Pacific Power & Light Co. from bench mark T 24. (34.081 meters or 111.813 feet.)

U 24.—About $12\frac{1}{2}$ miles west of **The Dalles**, Wasco County, at Chatfield siding, 25 feet east of a road crossing and 35 feet south of the Oregon-Washington Railroad & Navigation Co. tracks. A concrete post with disk in top. (29.670 meters or 97.342 feet.)

V 24.—About 9 miles west of **The Dalles**, Wasco County, and 1 mile west of **Rowena** station, opposite milepost 75 of the Oregon-Washington Railroad & Navigation Co., 18 feet north of the track. A brass disk in a shelf on the west side of a large conspicuous sandstone boulder. (29.509 meters or 96.814 feet.)

X 24.—About 6 miles west of **The Dalles**, Wasco County, along the Oregon-Washington Railroad & Navigation Co., $\frac{1}{2}$ mile west of private road crossing, at east end of railroad fill 1 mile long. A brass disk in short sandstone cliff. (31.840 meters or 104.462 feet.)

Y 24.—About $3\frac{1}{2}$ miles west of **The Dalles**, Wasco County, in the top of the southwest abutment of the Oregon-Washington Railroad & Navigation Co. bridge over Chenoweth Creek. A brass disk. (38.777 meters or 127.221 feet.)

A 25.—At **The Dalles**, Wasco County, in the north wall of the Oregon-Washington Railroad & Navigation Co. depot at the east side of the entrance to the waiting room. A brass disk. (31.102 meters or 102.040 feet.)

B 25.—At **The Dalles**, Wasco County, in the northeast corner of the post-office building. A brass disk. (29.809 meters or 97.798 feet.)

C 25.—At **The Dalles**, Wasco County, in the north wall of the Stadelman Bonn Hardware Co. building. A brass disk. (32.094 meters or 105.295 feet.)

D 25 (U. S. G. S.).—At **The Dalles**, Wasco County, 20 feet from southeast corner of old Wasco County courthouse, now used as a morgue, 75 feet north of center of Third Street and 75 feet west of center of Union Street. An iron post stamped "103 A." (31.663 meters or 103.881 feet.)

E 25.—About $1\frac{3}{4}$ miles east of **The Dalles**, Wasco County, in the southwest abutment of the Oregon-Washington Railroad & Navigation Co. bridge over Threemile Creek, 170 feet north of the Columbia River Highway at highway mileage 93.2. A brass disk. (34.420 meters or 112.926 feet.)

F 25.—At **Seufert**, about 3 miles east of **The Dalles**, Wasco County, near Seufert's Cannery, in the southwest abutment of the Oregon-Washington Railroad & Navigation Co. bridge over Fifteenmile Creek, 215 feet north of the Columbia River Highway at highway mileage 94.7. A brass disk. (41.386 meters or 135.781 feet.)

B. M. Bolt.—At **Seufert**, about 3 miles east of **The Dalles**, Wasco County, in the curb in the northeast corner of the Columbia River Highway viaduct over Fifteenmile Creek. A copper bolt. (42.801 meters or 140.423 feet.)

G 25.—About 4 miles east of **The Dalles**, Wasco County, at the western end of the Celilo-Big Eddy Canal, built by the United States Engineers, and 35 feet north to the post office, 45 feet south of the Columbia River Highway, at highway mileage 95.3, in the concrete base for the flagpole. A brass disk. (41.482 meters or 136.096 feet.)

J 25.—About $7\frac{3}{4}$ miles east of **The Dalles**, Wasco County, at **Dune** siding, at the north edge of the Oregon-Washington Railroad & Navigation Co. right of way, about 15 feet below the track level, set in outcropping rock, 309 feet south of the Columbia River Highway milepost 99. A brass disk. (49.061 meters or 160.901 feet.)

K 25.—About $8\frac{3}{8}$ miles east of **The Dalles**, Wasco County, in the Columbia River Highway viaduct over the Oregon-Washington Railroad & Navigation Co. tracks at highway mileage 99.7, in the western column of the first row of columns south of the tracks. A brass disk. (53.323 meters or 174.944 feet.)

P 25 (U. S. G. S.).—At **Celilo**, Wasco County, 100 feet west of the Oregon-Washington Railroad & Navigation Co. depot, 10 feet north of the track and 500 feet north of the Columbia River Highway at mileage 103.3. An iron post stamped "159 A." This bench mark was reset. (48.811 meters or 160.141 feet.)

L 25.—At **Celilo**, Wasco County, at the eastern end of the Celilo-Big Eddy Canal, 250 feet east of the easternmost lock gate and swing bridge, in a circular nub at the extreme east end of the south retaining wall. A brass disk. (46.184 meters or 151.522 feet.)

M 25.—About 2 miles west of **Sherman**, Sherman County, in the east end of the north railing wall of the Columbia River Highway bridge over Deschutes River. A brass disk. (50.984 meters or 167.270 feet.)

N 25.—About $\frac{1}{2}$ mile west of **Sherman**, Sherman County, in the northeast concrete abutment of the Columbia River Highway culvert. A brass disk. (49.564 meters or 162.811 feet.)

O 25 (U. S. G. S.).—About $\frac{1}{2}$ mile east of **Biggs**, Sherman County, 330 feet east of the water tank, 140 feet west of the Oregon-Washington Railroad & Navigation Co. bridge over Spanish Hollow Creek, 27 feet south of main track, in Y forming connection with main line and Shaniko branch line. An iron post originally stamped "177A" with these figures partially hammered out and the figures "164H" substituted. (52.494 meters or 172.224 feet.)

For additional bench marks in the vicinity of **Biggs**, see page 20.

Q 25.—At **Grant**, Sherman County, in the northwest corner of Maryhill Ferry Road crossing and 0.6 mile east of highway milepost 113. A concrete post with disk in top. (53.692 meters or 176.155 feet.)

Y 25 (U. S. G. S.).—At **Rufus**, Sherman County, 150 feet southwest of the Oregon-Washington Railroad & Navigation Co. depot, 130 feet south of the track, at west edge of roadway leading to station. An iron post stamped "179 A." (54.881 meters or 180.055 feet.)

R 25.—At **Rufus**, Sherman County, 250 feet east of the depot, in the southeast concrete abutment of the Oregon-Washington Railroad & Navigation Co. bridge. A brass disk. (53.600 meters or 175.853 feet.)

S 25.—About $3\frac{3}{8}$ miles east of **Rufus**, Sherman County, at the east end of **Day** siding, in the northwest abutment of the Oregon-Washington Railroad & Navigation Co. bridge. A brass disk. (55.318 meters or 181.473 feet.)

T 25.—About $5\frac{3}{4}$ miles east of **Rufus**, Sherman County, in the northwest abutment of the Oregon-Washington Railroad & Navigation Co. bridge over John Day River. A brass disk. (56.794 meters or 186.332 feet.)

U 25.—About $1\frac{3}{4}$ miles east of the east end of **Goff** siding, **Gilliam** County, 20 feet northeast of milepost 117 of the Oregon-Washington Railroad & Navigation Co., 25 feet south of the track in the vertical face of outcropping rock. A brass disk. (60.016 meters or 196.902 feet.)

Z 25 (U. S. G. S.).—At **Squally Hook**, Gilliam County, 80 feet northwest of the Oregon-Washington Railroad & Navigation Co. depot, 260 feet northwest of milepost 123, 40 feet north of main track, and 100 feet northeast of east connecting switch. An iron post stamped "193 A." (59.159 meters or 194.091 feet.)

W 25.—At **Squally Hook**, $2\frac{3}{4}$ miles west of **Quinton**, Gilliam County, in the east end of the retaining wall on the south side of the Columbia River Highway. A brass disk. (61.013 meters or 200.173 feet.)

A 26 (U. S. G. S.).—At **Quinton**, Gilliam County, 100 feet east of the depot and telegraph operator's house, and 4 feet south of the north right of way fence of the Oregon-Washington Railroad & Navigation Co. An iron post stamped "226 A." (69.476 meters or 227.939 feet.)

X 25.—About $\frac{3}{4}$ mile east of **Quinton**, Gilliam County, 150 feet west of road crossing at bunk and tool houses, in the northwest abutment of Oregon-Washington Railroad & Navigation Co. bridge. A brass disk. (69.580 meters or 228.280 feet.)

B 26.—At **Ramsay**, Gilliam County, 250 feet east of the east end of the siding, in the southeast abutment of the Oregon-Washington Railroad & Navigation Co. bridge, near highway milepost 133. A brass disk. (64.346 meters or 211.108 feet.)

C 26.—About $1\frac{3}{4}$ miles west of **Blalock**, Gilliam County, 25 feet northeast of milepost 128 of the Oregon-Washington Railroad & Navigation Co., 30 feet south of the track. A brass disk set in a large conspicuous boulder. (63.991 meters or 209.944 feet.)

D 26 (U. S. G. S.).—At **Blalock**, Gilliam County, 140 feet southeast of the depot, 170 feet south of the Oregon-Washington Railroad & Navigation Co. tracks, and 180 feet southwest of water tank. An iron post stamped "214 A." (65.696 meters or 215.538 feet.)

E 26.—About $\frac{1}{2}$ mile east of **Blalock**, Gilliam County, along the Oregon-Washington Railroad & Navigation Co. tracks, in the top of the east end of the north railing wall of the Columbia River Highway Bridge, 500 feet east of highway milepost 137. A brass disk. (65.880 meters or 216.141 feet.)

G 26 (R. R.).—About $1\frac{1}{2}$ miles east of **Blalock**, Gilliam County, in the vertical face of rock about 25 feet high, at the south edge of the Oregon-Washington Railroad & Navigation Co. right of way, 1 foot above the ground. The bench mark is an iron bolt set by the railroad company. (64.220 meters or 210.695 feet.)

F 26.—About $5\frac{3}{4}$ miles west of **Arlington**, Gilliam County, 8 feet south of the Oregon-Washington Railroad & Navigation Co. tracks, in a large wedge-shaped boulder, the edge of which points north. A brass disk. (65.436 meters or 214.685 feet.)

H 26.—About $3\frac{1}{2}$ miles west of **Arlington**, Gilliam County, and $\frac{1}{2}$ mile west of east end of Gilmore siding, 40 feet south of and 9 feet above the Oregon-Washington Railroad & Navigation Co. tracks, in the top of a concrete culvert under the Columbia River Highway. A brass disk. (67.466 meters or 221.345 feet.)

I 26.—About $1\frac{1}{2}$ miles west of **Arlington**, Gilliam County, 40 feet west of bridge No. 136.05 of the Oregon-Washington Railroad & Navigation Co., in the vertical face of rock 10 feet high. A brass disk. (68.776 meters or 225.643 feet.)

M 26 (U. S. G. S.).—At **Arlington**, Gilliam County, 80 feet east of the depot and 30 feet south of the main track of the Oregon-Washington Railroad & Navigation Co., in the southeast corner of the park between the depot and railroad lunch room. An iron post stamped "225 A." (69.201 meters or 227.037 feet.)

N 26.—About $2\frac{1}{2}$ miles east of **Arlington**, Gilliam County, along the Oregon-Washington Railroad & Navigation Co. tracks, in the north top face of the concrete bridge used as a cattle undercrossing. A brass disk. (67.183 meters or 220.416 feet.)

O 26.—About $4\frac{1}{3}$ miles east of **Arlington**, Gilliam County, 600 feet west of the west end of **Silica** siding, in a large boulder 18 feet south of the Oregon-Washington Railroad & Navigation Co. tracks. A brass disk. (69.688 meters or 228.635 feet.)

P 26.—About $7\frac{1}{3}$ miles east of **Arlington**, Gilliam County, 16 feet south of the Oregon-Washington Railroad & Navigation Co. tracks, in the top of a large conspicuous boulder. A brass disk. (69.058 meters or 226.568 feet.)

Q 26.—At **Willows**, Gilliam County, 350 feet east-southeast of the section house, 15 feet south of the track, and 22 feet north of the Oregon-Washington

Railroad & Navigation Co. right-of-way fence, in the vertical wall of outcropping rock. A brass disk. (70.271 meters or 230.547 feet.)

R 26 (U. S. G. S.).—At **Heppner Junction**, Gilliam County, 220 feet west of the depot, 12 feet south of the tracks of the Heppner branch of the Oregon-Washington Railroad & Navigation Co. An iron post stamped "240 A." (73.294 meters or 240.465 feet.)

S 26.—At **Heppner Junction**, Gilliam County, in the top of the southwest concrete abutment of the Oregon-Washington Railroad & Navigation Co. steel bridge over Willow Creek. A brass disk. (74.070 meters or 243.011 feet.)

T 26.—About 2 miles east of **Heppner Junction**, Gilliam County, 150 feet west of block signal at mileage 150.7 of the Oregon-Washington Railroad & Navigation Co., 50 feet west of crossing gates, and 25 feet south of the track. A concrete post with disk in top. (71.025 meters or 233.021 feet.)

U 26 (U. S. G. S.).—At **Boulder**, Morrow County, 500 feet east of the east end of the siding and 16 feet south of the Oregon-Washington Railroad & Navigation Co. track. An iron post stamped "240 A." (73.472 meters or 241.049 feet.)

V 26.—About 2½ miles west of **Castle Rock**, Morrow County, 30 feet south of the Oregon-Washington Railroad & Navigation Co. track, in line with the telegraph poles, and 2 feet west of east fence at crossing. A concrete post with disk in top. (72.613 meters or 238.231 feet.)

W 26 (U. S. G. S.).—At **Castle Rock**, Morrow County, 90 feet east of the depot and 2 feet north of the south right-of-way fence of the Oregon-Washington Railroad & Navigation Co. An iron post stamped "240 A." (73.774 meters or 242.040 feet.)

X 26.—About 3 miles west of **Boardman**, Morrow County, at the crossing gates near milepost 161 of the Oregon-Washington Railroad & Navigation Co., 2 feet north of the south fence, 15 feet west of the south gate, and 0.5 mile east of highway milepost 168. A concrete post with disk in top. (74.171 meters or 243.343 feet.)

J 26 (U. S. R. S.).—About 2½ miles west of **Boardman**, Morrow County, along the Oregon-Washington Railroad & Navigation Co. tracks, in the south top face of concrete culvert over an irrigation ditch 0.3 mile east of highway milepost 169. A United States Reclamation Service bench-mark tablet stamped "247.11." (75.442 meters or 247.513 feet.)

Y 26 (U. S. G. S.).—About ¾ mile west of **Boardman**, Morrow County, 75 feet east of milepost 163 of the Oregon-Washington Railroad & Navigation Co., and 32 feet south of the track. An iron post stamped "247 A." (75.808 meters or 248.713 feet.)

Z 26.—At **Boardman**, Morrow County, at the intersection of prolonged line of roadway at depot and the north right-of-way fence. A concrete post with disk in top. (76.079 meters or 249.603 feet.)

A 27.—About 1 mile east of **Messner**, Morrow County, 12 feet north of the Oregon-Washington Railroad & Navigation Co. track at a crossing, and 4 feet west of the east fence. A concrete post with disk in top. (82.642 meters or 271.135 feet.)

B 27 (U. S. G. S.).—About 1¼ miles east of **Messner**, Morrow County, ¼ mile east of road crossing and 21 feet south of the Oregon-Washington Railroad & Navigation Co. track. An iron post stamped "271 A." (83.248 meters or 273.123 feet.)

C 27.—About 2¾ miles east of **Messner**, Morrow County, and 32 feet south of the Oregon-Washington Railroad & Navigation Co. track. A concrete post with disk in top. (84.289 meters or 276.538 feet.)

D 27.—About 3 miles west of **Irrigon**, Morrow County, 16 feet south of the Oregon-Washington Railroad & Navigation Co. tracks at the west edge of road crossing. A concrete post with disk in top. (81.844 meters or 268.517 feet.)

E 27 (U. S. G. S.).—About 1¼ miles west of **Irrigon**, Morrow County, 35 feet west of milepost 177 of Oregon-Washington Railroad & Navigation Co., and 30 feet south of the track. An iron post stamped "278 A." (85.310 meters or 279.888 feet.)

G 27.—About 1 mile west of **Irrigon**, Morrow County, along the Oregon-Washington Railroad & Navigation Co. tracks, 4 feet west of the south gate at a private road crossing. A concrete post with disk in top. (87.361 meters or 286.617 feet.)

H 27.—At **Irrigon**, Morrow County, 16 feet north of the track at the west edge of Main Street. A concrete post with disk in top. (90.589 meters or 297.207 feet.)

I 27.—At **Bailey**, Umatilla County, 160 feet west of the Morrow-Umatilla county line, at the west edge of a private road crossing the Oregon-Washington Railroad & Navigation Co. tracks, and south of the track. A concrete post with disk in top. (91.480 meters or 300.131 feet.)

J 27.—About 1 mile west of **Umatilla**, Umatilla County, along the Oregon-Washington Railroad & Navigation Co. tracks, at the east edge of a road crossing, and south of the track. A concrete post with disk in top. (93.954 meters or 308.247 feet.)

K 27.—At **Umatilla**, Umatilla County, in the southeast abutment of the steel railroad bridge over the Umatilla River. A brass disk. (89.976 meters or 295.196 feet.)

L 27 (U. S. G. S.).—At **Umatilla**, Umatilla County, 48 feet east of the northeast corner of the water tank, and midway between this water tank and the freight loading platform. An iron post stamped "294 A." (90.204 meters or 295.944 feet.)

M 27.—About $2\frac{3}{4}$ miles east of **Umatilla**, Umatilla County, along the Oregon-Washington Railroad & Navigation Co. tracks, opposite the section house and in the north top face of the concrete culvert. A brass disk. (97.916 meters or 321.246 feet.)

N 27.—About $4\frac{1}{4}$ miles northeast of **Umatilla**, Umatilla County, and 35 feet north of the Oregon-Washington Railroad & Navigation Co. track. A concrete post with disk in top. (112.494 meters or 369.074 feet.)

O 27 (U. S. G. S.).—About $5\frac{1}{4}$ miles northeast of **Umatilla**, Umatilla County, 45 feet north of milepost 192 of Oregon-Washington Railroad & Navigation Co., and 15 feet north of the track. An iron post stamped "378 A." (115.795 meters or 379.904 feet.)

P 27.—At **Riverview**, Umatilla County, 1,500 feet west of the west end of the siding, 25 feet north of the Oregon-Washington Railroad & Navigation Co. tracks, in a large sandstone boulder. A brass disk. (124.976 meters or 410.025 feet.)

Q 27.—About 1 mile west of **Cold Springs**, Umatilla County, opposite milepost 193 of the Oregon-Washington Railroad & Navigation Co., at the south right-of-way fence. A concrete post with disk in top. (115.599 meters or 379.261 feet.)

R 27 (U. S. G. S.).—At **Cold Springs**, Umatilla County, 400 feet west of the west end of siding, and 25 feet north of the Oregon-Washington Railroad & Navigation Co. tracks. An iron post stamped "362 A." (110.752 meters or 363.359 feet.)

W 27.—About $1\frac{1}{4}$ miles east of **Cold Springs**, Umatilla County, at the northwest corner of a road crossing. A concrete post with disk in top. (103.522 meters or 339.638 feet.)

S 27.—At **Sand**, Umatilla County, at the east end of the siding in the vertical face of outcropping rock 9 feet high south of the Oregon-Washington Railroad & Navigation Co. track. A brass disk. (97.284 meters or 319.173 feet.)

T 27 (U. S. G. S.).—At the mouth of **Juniper Canyon**, Umatilla County, 4 feet west of west corner of fence at section house and 18 feet northeast of the Oregon-Washington Railroad & Navigation Co. track. An iron post stamped "313 A." (95.800 meters or 314.304 feet.)

U 27.—About 1 mile west of **Juniper**, Umatilla County, 100 feet southeast of the Oregon-Washington Railroad & Navigation Co. tracks at a road crossing, in the top of a large boulder. A brass disk. (99.134 meters or 325.242 feet.)

V 27.—North of **Juniper**, Umatilla County, along the Oregon-Washington Railroad & Navigation Co. tracks, $\frac{1}{2}$ mile south of the Washington-Oregon State line, 12 feet south of the track in the vertical face of a cliff. A brass disk. (96.302 meters or 315.951 feet.)

Y 12 (U. S. G. S.).—At **State Line**, Umatilla County, along the Oregon-Washington Railroad & Navigation Co. tracks, 570 feet east of Oregon-Washington State line post, 150 feet east of milepost 208, 18 feet south of the track. An iron post stamped "318 A." (97.405 meters or 319.570 feet.)

Z 12.—About 5 miles southwest of **Wallula**, Walla Walla County, Wash., along the Oregon-Washington Railroad & Navigation Co. tracks, $\frac{3}{4}$ mile east of a public road crossing, 19 feet south of track. A brass disk in a round-topped boulder. (99.177 meters or 325.383 feet.)

A 13.—About 2 miles southwest of **Wallula**, Walla Walla County, Wash., along the Oregon-Washington Railroad & Navigation Co. tracks, 300 feet east of a public road crossing, 24 feet south of the track. A brass disk in a boulder. (108.018 meters or 354.389 feet.)

B 13.—At **Wallula**, Walla Walla County, Wash., in the south concrete abutment of the Oregon-Washington Railroad & Navigation Co. steel bridge over Walla Walla River. A brass disk. (98.434 meters or 322.946 feet.)

C 13 (U. S. G. S.).—At **Wallula**, Walla Walla County, Wash., in the center of the Oregon-Washington Railroad & Navigation Co. Y just north of their steel bridge over the Walla Walla River. An iron post stamped "322 A." (98.658 meters or 323.680 feet.)

LINE IX. BEND TO PRINEVILLE, OREG.

This line follows the Oregon Trunk Railway from Bend to Prineville Junction and the City of Prineville Railway from Prineville Junction to Prineville, Oreg. The field work was done between August 29 and September 17, 1924, by J. D. Crichton, junior hydrographic and geodetic engineer.

For additional bench marks at Bend, see page 44.

A 30.—At **Bend**, Deschutes County, in the concrete step at the main entrance to the Pilot Butte Inn. A brass disk. (1,105.970 meters or 3,628.503 feet.)

B 30.—About 1½ miles north of **Bend**, Deschutes County, on the Oregon Trunk Railway, in the west side of a culvert over an irrigation ditch. A brass disk. (1,086.276 meters or 3,563.890 feet.)

C 30.—About 4 miles north of **Bend**, Deschutes County, on the Oregon Trunk Railway, 42 feet south of a public road crossing and 35 feet west of the track, in a ledge of outcropping lava rock. A brass disk. (1,048.121 meters or 3,438.710 feet.)

D 30.—About 5½ miles north of **Bend**, Deschutes County, on the Oregon Trunk Railway, on the east side of the track at a public road crossing, and near the north fence adjoining a cattle guard. A concrete post with disk in top. (1,021.418 meters or 3,351.102 feet.)

E 30.—About 1 mile north of **Deschutes**, Deschutes County, on the Oregon Trunk Railway, in the south side of a concrete irrigating ditch siphon. A brass disk. (999.149 meters or 3,278.041 feet.)

F 30.—About 3 miles north of **Deschutes**, Deschutes County, on the Oregon Trunk Railway, in the southwest quarter of a road crossing. A concrete post with railroad spike in top. (960.867 meters or 3,152.444 feet.)

G 30.—At **Redmond**, Deschutes County, in the concrete base of an elevated railroad water tank adjacent to the Oregon Trunk Railway depot. A brass disk. (911.904 meters or 2,991.805 feet.)

H 30.—At **Redmond**, Deschutes County, in the northwest corner of the First National Bank Building. A brass disk. (913.989 meters or 2,998.646 feet.)

I 30.—About 1¼ miles north of **Redmond**, Deschutes County, on the Oregon Trunk Railway, in the southeast quarter of a public road crossing. A concrete post with disk in top. (908.303 meters or 2,979.991 feet.)

J 30.—At **Prineville Junction**, Deschutes County, on the Oregon Trunk Railway, 15 feet east of the south switch at the junction. A concrete post with disk in top. (899.796 meters or 2,952.081 feet.)

K 30.—About ¼ mile east of **Prineville Junction**, Deschutes County, on the City of Prineville Railway, in the southwest quarter of a public road crossing. A concrete post with disk in top. (897.203 meters or 2,943.573 feet.)

L 30.—About 1½ miles west of **McAllister**, Crook County, on the City of Prineville Railway, at the east end of a steep grade, and in the southwest quarter of a public road crossing. A concrete post with disk in top. (846.902 meters or 2,778.544 feet.)

M 30.—At **McAllister**, Crook County, on the City of Prineville Railway, in the southwest quarter of a public road crossing. A concrete post with disk in top. (847.776 meters or 2,781.412 feet.)

N 30.—About 2 miles east of **McAllister**, Crook County, on the City of Prineville Railway, in the concrete abutment of a road bridge over a creek 55 feet north of the track. A brass disk. (852.238 meters or 2,796.051 feet.)

O 30.—At **Wilton**, Crook County, on the City of Prineville Railway, in the top of the east wall of an irrigation-ditch flume. A brass disk. (867.228 meters or 2,845.231 feet.)

U. S. G. S. 2849 H.—About 3 miles northwest of **Prineville**, Crook County, on the City of Prineville Railway, at the northeast corner of W. T. Davenport's

yard, near the fence and at the edge of the road. An iron post stamped "2849 H." (870,904 meters or 2,857,291 feet.)

P 30.—About 1¼ miles northwest of Prineville, Crook County, on the City of Prineville Railway, 15 feet south of the track at the point where the county road turns to the northward away from the railroad. A concrete post with disk in top. (868.408 meters or 2,849,095 feet.)

2867 H (U. S. G. S.).—At Prineville, Crook County, at the main entrance gate to the county courthouse, 4 feet above the ground. An iron post stamped "2867 H." (874.383 meters or 2,868,705 feet.)

2872 B (U. S. G. S.).—At Prineville, Crook County, in the northeast corner of county courthouse, 4 feet above the ground. An aluminum tablet stamped "2872 B 1908 B. R. 2." (875.482 meters or 2,872,310 feet.)

T 30 (Prineville City B. M.).—At Prineville, Crook County, at the northeast corner of Second and A Streets, on the north side of a hydrant. A cut in the hydrant flange. (873.911 meters or 2,867.156 feet.)

U 30 (Prineville City B. M.).—At Prineville, Crook County, at the southeast corner of Fourth and A Streets, on the southwest side of a hydrant. A cut in the hydrant flange. (873.453 meters or 2,865.654 feet.)

ELEVATIONS OF TOP OF RAIL IN FRONT OF DEPOTS

The elevations of the top of rail in the following lists were determined during the course of the leveling, when the work followed a railroad, and refer to the point as it was at the time the leveling was done. These elevations should be used with caution, as in many cases there have since been changes in the railroad grade.

LINE II.—Owyhee, Idaho, to Hunt, Wash. (part), 1904

| Place | Elevation | | Place | Elevation | |
|----------------------|-----------|----------|-----------------------|-----------|----------|
| | Meters | Feet | | Meters | Feet |
| Nyssa..... | 664.49 | 2,180.08 | Spring Spur..... | 1,201.04 | 3,940.41 |
| Arcadia..... | 661.94 | 2,171.71 | Kamola..... | 1,281.76 | 4,205.21 |
| Ontario..... | 656.54 | 2,154.00 | Murdock Spur..... | 1,182.91 | 3,816.31 |
| Huntington..... | 642.98 | 2,109.51 | | | |
| Weatherby..... | 732.44 | 2,403.01 | Nibley Spur..... | 1,135.21 | 3,724.43 |
| | | | Meacham..... | 1,121.93 | 3,680.87 |
| Durkee..... | 809.23 | 2,654.95 | Huron..... | 887.50 | 2,911.74 |
| Unity..... | 954.35 | 3,131.06 | Allens Spur..... | 858.17 | 2,815.61 |
| Pleasant Valley..... | 1,164.36 | 3,820.07 | North Fork..... | 704.34 | 2,310.82 |
| Enclina..... | 1,208.60 | 3,965.22 | | | |
| Norton..... | 1,113.30 | 3,652.55 | Gibbon..... | 533.22 | 1,749.41 |
| | | | Thorn Hollow..... | 479.12 | 1,571.91 |
| Baker..... | 1,047.20 | 3,435.69 | Cayuse..... | 430.94 | 1,413.84 |
| Haines..... | 1,016.23 | 3,334.08 | Mission..... | 370.30 | 1,214.80 |
| Hutchinson..... | 1,027.89 | 3,372.34 | Pendleton..... | 326.23 | 1,070.31 |
| North Powder..... | 988.38 | 3,242.71 | | | |
| Telocaset..... | 1,051.20 | 3,448.81 | Fulton..... | 465.28 | 1,526.51 |
| | | | McCormmach..... | 491.58 | 1,612.70 |
| Union..... | 828.19 | 2,717.15 | Warren..... | 623.01 | 1,715.91 |
| Nodine Spur..... | 823.75 | 2,702.59 | Helix..... | 536.10 | 1,758.85 |
| Hot Lake..... | 823.40 | 2,701.64 | Apex..... | 582.70 | 1,911.74 |
| LaGrande..... | 848.78 | 2,784.71 | | | |
| Tie Spur..... | 895.81 | 2,939.00 | Killian Junction..... | 549.33 | 1,802.26 |
| | | | Stanton..... | 506.56 | 1,661.94 |
| Hillgard..... | 917.02 | 3,008.59 | Vansyco..... | 428.72 | 1,406.56 |
| Steel Spur..... | 1,029.05 | 3,376.14 | Canon..... | 278.62 | 915.09 |

LINE III.—Kirk, Oreg., to Roseville, Calif. (part), 1919

| Place | Elevation | | Place | Elevation | |
|----------------|-----------|----------|--------------------|-----------|----------|
| | Meters | Feet | | Meters | Feet |
| Sprague..... | 1,368.72 | 4,490.54 | Klamath Falls..... | 1,251.18 | 4,104.91 |
| Chiloquin..... | 1,277.14 | 4,190.08 | Ivan..... | 1,266.28 | 4,154.46 |

LINE VI.—Weed, Calif., to Portland, Oreg. (part), 1920

| Place | Elevation | | Place | Elevation | |
|---------------------|-----------|----------|-------------------------------------|-----------|--------|
| | Meters | Feet | | Meters | Feet |
| Colestin..... | 1,131.41 | 3,711.97 | Anlauf..... | 114.15 | 374.51 |
| Siskiyou..... | 1,252.63 | 4,109.67 | Curtin..... | 119.41 | 391.70 |
| Steinman..... | 923.89 | 3,031.13 | Comstock..... | 136.92 | 449.21 |
| Mistletoe..... | 760.20 | 2,494.38 | Cottage Grove..... | 195.77 | 642.29 |
| Ashland..... | 669.78 | 1,869.35 | Saginaw..... | 185.60 | 608.92 |
| Talent..... | 498.47 | 1,635.40 | Creswell..... | 105.12 | 541.73 |
| Phoenix..... | 470.44 | 1,543.44 | Goshen..... | 152.57 | 500.50 |
| Medford..... | 419.07 | 1,374.90 | Springfield Junction..... | 136.34 | 447.31 |
| Central Point..... | 389.00 | 1,276.24 | Eugene..... | 130.17 | 426.97 |
| Tolo..... | 367.49 | 1,172.87 | Irving..... | 115.09 | 377.59 |
| Raygold..... | 355.78 | 1,167.25 | Junction City..... | 99.56 | 326.04 |
| Gold Hill..... | 330.55 | 1,084.48 | Harrisburg..... | 94.52 | 310.10 |
| Rogue River..... | 304.75 | 990.83 | Alford..... | 92.05 | 304.95 |
| Grants Pass..... | 285.28 | 935.96 | Halsey..... | 86.50 | 283.79 |
| Dimmick Summit..... | 282.14 | 1,263.74 | Shedd..... | 80.37 | 263.08 |
| Merlin..... | 277.92 | 911.81 | Tangent..... | 74.99 | 240.03 |
| Hugo..... | 393.95 | 1,292.48 | Albany..... | 65.00 | 213.55 |
| Leland..... | 302.83 | 1,000.38 | Millersburg..... | 74.85 | 245.57 |
| Wolf Creek..... | 394.30 | 1,293.83 | Jefferson..... | 73.89 | 242.39 |
| Glendale..... | 432.21 | 1,418.01 | Marion..... | 91.58 | 300.46 |
| West Fork..... | 308.70 | 1,012.79 | Turner..... | 87.08 | 285.69 |
| Union Creek..... | 274.74 | 901.38 | Salem..... | 40.81 | 163.42 |
| Byers..... | 238.80 | 783.46 | Chemawa..... | 50.12 | 164.44 |
| Riddle..... | 215.96 | 708.53 | Brooks..... | 56.12 | 184.12 |
| Murtle Creek..... | 187.18 | 614.11 | Gervais..... | 50.02 | 185.70 |
| Dole..... | 174.23 | 571.62 | Woodburn..... | 55.40 | 181.76 |
| Dillard..... | 158.87 | 521.23 | Hubbard..... | 55.88 | 183.33 |
| Green..... | 156.59 | 513.75 | Aurora..... | 36.75 | 120.57 |
| Roseburg..... | 140.78 | 461.88 | Barlow..... | 31.27 | 102.59 |
| Winchester..... | 139.79 | 458.03 | Canby..... | 46.36 | 152.10 |
| Wilbur..... | 142.08 | 466.14 | New Era..... | 28.05 | 92.03 |
| Sutherland..... | 158.17 | 518.93 | Coalco..... | 27.55 | 90.39 |
| Oakland..... | 130.14 | 426.97 | Oregon City..... | 23.16 | 75.98 |
| Isadora..... | 171.39 | 562.30 | Clackamas..... | 33.21 | 108.96 |
| Rice Hill..... | 218.41 | 716.57 | Willsburg..... | 18.50 | 60.70 |
| Yoncalla..... | 108.36 | 355.51 | Brooklyn..... | 16.78 | 55.05 |
| Drain..... | 90.13 | 295.70 | Portland, East Morrison Street..... | 0.22 | 30.25 |
| Leona..... | 98.93 | 324.57 | | | |

LINE VII.—Portland to Astoria, Oreg., 1920

| Place | Elevation | | Place | Elevation | |
|------------------------|-----------|--------|--------------------|-----------|-------|
| | Meters | Feet | | Meters | Feet |
| Willbridge..... | 13.97 | 45.83 | Tryon..... | 0.20 | 20.34 |
| Gasco..... | 11.38 | 37.34 | Downings..... | 0.00 | 19.09 |
| Claremont..... | 10.45 | 34.28 | Pyramid..... | 0.02 | 19.75 |
| Linnton..... | 12.32 | 40.42 | Mayger..... | 5.48 | 17.98 |
| Burlington..... | 10.23 | 33.56 | Quincy..... | 5.30 | 17.68 |
| Holbrook..... | 9.99 | 32.77 | Clatskanie..... | 5.31 | 17.42 |
| Johnsons Crossing..... | 10.52 | 34.51 | Marshland..... | 5.11 | 16.77 |
| Scappoose..... | 18.74 | 61.48 | Kerry..... | 3.95 | 12.96 |
| Honeyman..... | 15.04 | 49.34 | Westport..... | 0.45 | 21.10 |
| Warren..... | 15.18 | 49.80 | Wauna..... | 3.71 | 12.17 |
| McNulty..... | 19.14 | 62.80 | Clifton..... | 3.34 | 10.90 |
| St. Helens..... | 32.51 | 106.66 | Aldrich Point..... | 3.09 | 12.11 |
| Deer Island..... | 14.70 | 48.23 | Brownsmead..... | 2.93 | 9.61 |
| Tide Creek..... | 8.33 | 27.33 | Blind Slough..... | 3.76 | 12.34 |
| Charlton..... | 7.54 | 24.74 | Knappa..... | 3.09 | 10.14 |
| Nehalem Junction..... | 7.42 | 24.34 | Svensen..... | 3.02 | 9.91 |
| Goble..... | 8.45 | 27.72 | John Day..... | 3.24 | 10.63 |
| Prescott..... | 6.71 | 22.01 | Astoria..... | 3.77 | 12.37 |
| Rainier..... | 6.98 | 22.60 | Warrenton..... | 2.10 | 7.00 |

LINE VIII.—Portland, Oreg., to Wallula, Wash., 1921

| Place | Elevation | | Place | Elevation | |
|----------------------|-----------|--------|-----------------------|-----------|--------|
| | Meters | Feet | | Meters | Feet |
| Fairview..... | 34.81 | 114.20 | Mosler..... | 29.78 | 97.70 |
| Troutdale..... | 15.36 | 50.07 | The Dalles..... | 29.72 | 97.51 |
| Corbett..... | 12.84 | 42.13 | Sherman..... | 51.01 | 167.36 |
| Latourelle..... | 13.77 | 45.19 | Blggs..... | 52.08' | 170.87 |
| Bridal Veil..... | 13.05 | 42.91 | Quinton..... | 70.02 | 229.72 |
| Multnomah Falls..... | 13.16 | 43.18 | Blalock..... | 66.65 | 218.67 |
| Bonneville..... | 15.67 | 51.41 | Arlington..... | 68.77 | 225.02 |
| Cascade Locks..... | 30.86 | 101.25 | Heppner Junction..... | 73.33 | 240.58 |
| Wyeth..... | 30.06 | 98.62 | Boardman..... | 76.65 | 251.48 |
| Viento..... | 31.77 | 104.23 | Messner..... | 84.36 | 276.77 |
| Hood River..... | 30.76 | 100.62 | Umatilla..... | 90.16 | 295.80 |

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