F. CNARE.

PLOTTING DEVICE FOR CIVIL ENGINEERS.

APPLICATION FILED APR. 9, 1917.

1,356,971. **Patented Oct. 26, 1920.**

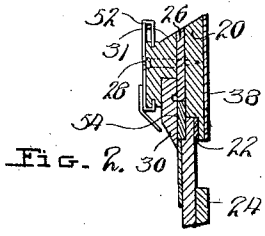


Fig. 2.

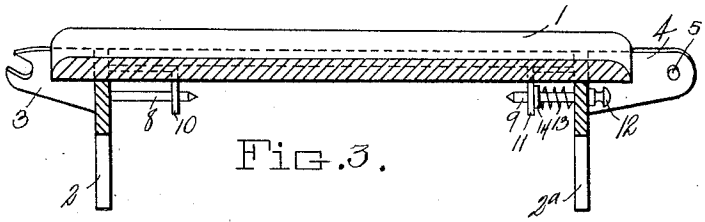


Fig. 3.

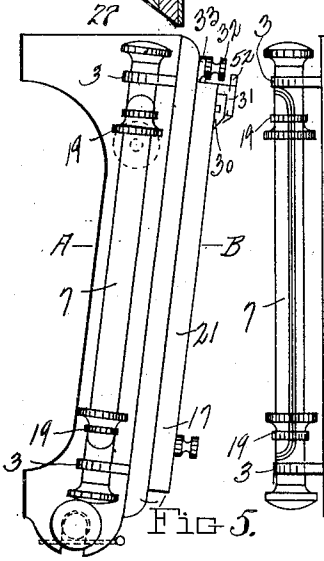


Fig. 5.

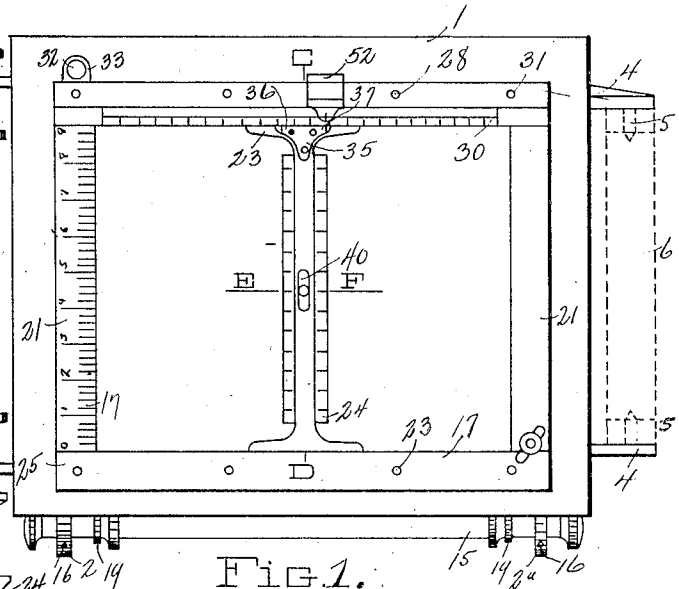


Fig. 1.

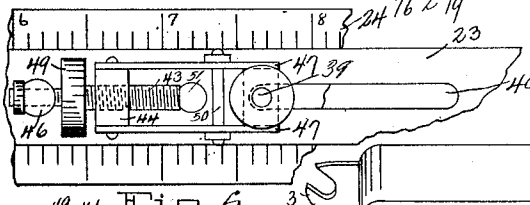


Fig. 6.

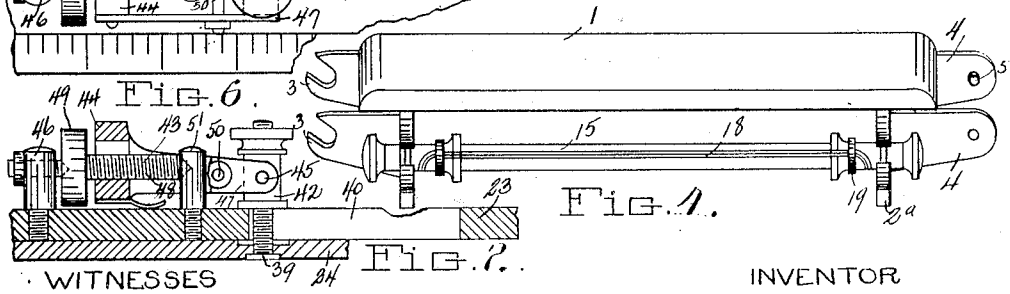


Fig. 4.

Fig. 7.

WITNESSES

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PLOTTING DEVICE FOR CIVIL ENGINEERS.

1,356,971. Specification of Letters Patent. Patented Oct. 26, 1920.

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To all whom it may concern:

Be it known that I, FRANK CNARE, a citizen of the United States, residing at Madison, in the county of Dane and State of Wisconsin, have invented certain new and useful Improvements in Plotting Devices for Civil Engineers, of which the following is a specification.

My invention relates to devices for plotting cross sections in civil engineer's work; and the objects of my invention are—

First—to provide a convenient means for holding the cross section paper; second—a means for readily locating points on the cross-section paper, both vertical and horizontal in relation to the transit line, and in relation to datum, the elevation of which is known, by employing two graduated scales slidably mounted in a frame, located above the cross-section paper; third—by plotting rod readings instead of elevations, to obviate the necessity of subtracting the rod reading from the height of the instrument; and fourth—to provide a means for mounting the scale carrying frame above the cross-section paper, whereby the two scales can be adjusted in perfect alinement with the lines on the paper.

I attain these objects by the mechanism shown in the accompanying drawings in which—

Figure 1, is a plan, Fig. 2, is a section on line C—D, Fig. 1, Fig. 3, is a longitudinal section on line A—B, Fig. 5, Fig. 4, is a front elevation, Fig. 5, is a left side elevation, Fig. 6, is a plan of the adjusting means for vertical scale, and Fig. 7, is a section of adjusting means for vertical scale, on line C—D, Fig. 1.

Similar numerals refer to similar parts throughout the several views.

The table, 1, rounded downward on all four sides and provided with two transverse ribs, 2, and 2^a, forms the main frame of my device. Upon the outer surface of the rib, 2, are located brackets, 3. The outer ends of said brackets are bifurcated forming bearings for a roller, 7, hereinafter more fully described. To the outside of rib, 2^a are hingedly secured brackets, 4, provided with pins, 5, said pins adapted to revolubly secure a roll of cross-section paper, said paper being passed over the top of the table, 1, and under the plotting frame, 17, and rolled on to the roller, 7, when using paper longitudinally of the table. When desirable to use paper across the table from back to front, two pins, 8, and 9 are provided projecting inward from adjacent the rear ends of the ribs, 2, and 2^a. The pin, 8, is secured at the rear end to the rib, 2, and a bracket, 10, supports the front end a distance from the point. The pin, 9, passes through the rib, 2^a, and the bracket, 11, and is provided with a knob, 12, on the outer end. A spring, 13, is disposed on the pin, 9, between the rib, 2^a, and a collar, 14, adapted to hold the pin forward and the knob, 12 against the outside of the rib. The paper on a roll held between the pins, 8, and 9, passes over the table, 1, from back to front and is wound upon the roller, 15. The front ends of the ribs, 2, and 2^a, extend forward of the table, 1, and are rounded vertically. Approximately the center of the projecting ends of the ribs a bearing is formed for the roller, 15, which is secured in revoluble position by the pins, 16, passing downward in front of the same. The rollers, 7, and 15, are duplicates excepting in length, their form and construction being for a particular purpose, namely; to grip cross-section paper at any point without mutilating or injuring the lines or surface in any manner. To secure this result the rolls are built in two sections inside of the bearings and faced with felt or similar material and the sections secured together and in contact with the paper by the sliding rings, 19.

The plotting frame, 17, comprises side and end rails, 20 and 21. The side rails, 20, are rabbeted at their upper inner edges and faced on the bottom with felt, 22, forming a guide or track for the ends of the runner, 23 to the bottom of the runner scale, 24, which is slidably secured by means hereafter described. The said runner is built of metal, preferably aluminum and is in the form of the letter "I," with the top and bottom bars rabbeted a distance below the upper surface, adapted to slide against and be kept in alinement by the bands, 25 and 26, which are secured to the rails, 20 by screws, 27 and 28. The band, 26, has a rib, 29 extending the entire length of the top adapted to secure in sliding relation a scale, 30, which is retained in contact with the band, 26, by the cover, 31, and the screws, 28. The entire plotting frame, 17, is secured to the table, 1, by a thumb screw, 32, through one leaf of hinge, 33, and adjusting screw, 34. The frame 17, is pivoted on thumb

screw 32, and by loosening the adjusting screw 34, it can be swung diagonally of the table. A plate, 35, is secured to the upper edge of the runner, 23, and is marked with lines, 36 and 37, corresponding to the edges of the scale, 24. The entire bottom surface of the plotting frame is covered with felt or suitable material, 38. The scale, 24, before mentioned, is attached to the bottom of the runner, 23 by means of one or more rivets, 39, passing upward through the scale and a longitudinal slot, 40, in the runner, and secured to a plate, 41. Slidably disposed on top of runner bar lugs 42 are located a distance from the ends of the slot, 40, and a screw, 43 is revolubly mounted between said lugs. A half nut cap, 44, is secured by a hinge pin, 45, to knuckles, 46 on the plate, 41, adapting the half nut of the cap to mesh with the thread of the screw, 43, for adjusting the graduations of the scale, 24, in proper relation to the lines on the cross-section paper in use. Said cap, 44, is held in contact with the screw, 43, by a spring, 48, disposed between the head, 47, on the post, 49, and the cap, 44.

Claim—

In a device of the kind described, a table; a frame mounted on top of said table; a runner comprising a center bar disposed between the rails of said frame; a scale adjustably secured to the center bar of said runner and means for adjusting said scale in relation to the center bar.

In testimony whereof I affix my signature in the presence of two subscribing witnesses.

FRANK CNARE.

Witnesses:

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