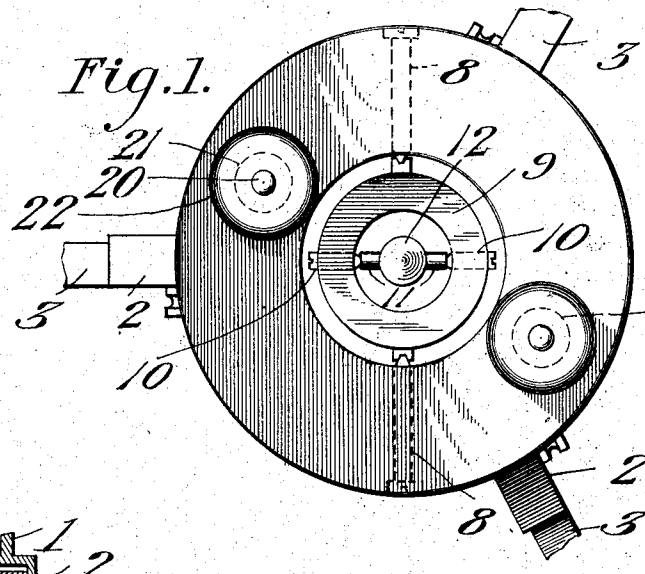
No. 839,005. PATENTED DEC. 18, 1906.

N. LAFON.

RANGE ROD.

APPLICATION FILED JAN. 13, 1906.

Fig. 1.



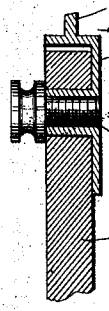


Fig. 3.

Fig. 2.

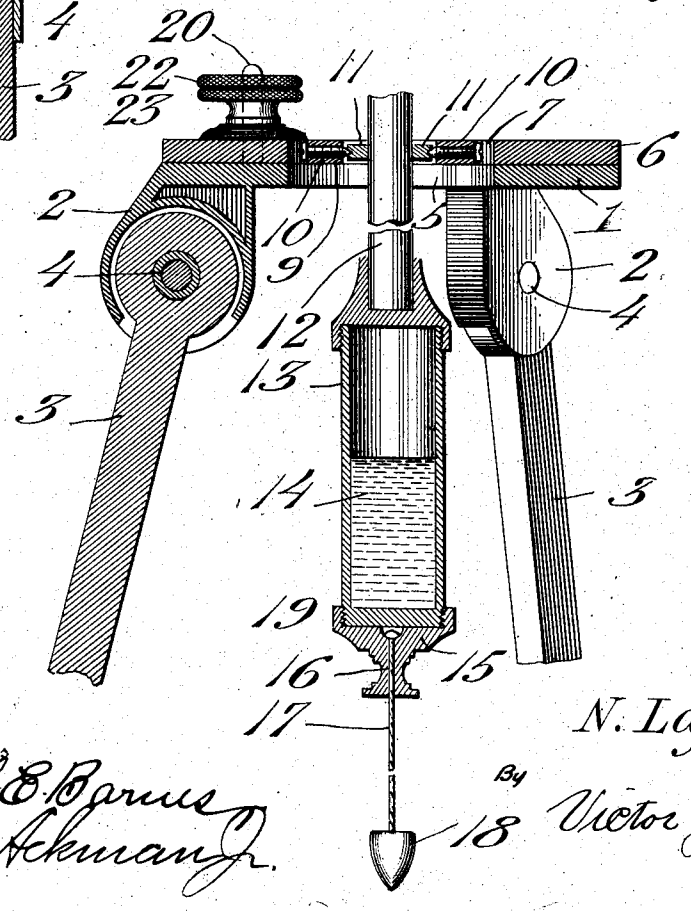


Fig. 4.

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UNITED STATES PATENT OFFICE.

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RANGE-ROD.

No. 839,005. Specification of Letters Patent. Patented Dec. 18, 1906.

Application filed January 13, 1906. Serial No. 295,964.

To all whom it may concern:

Be it known that I, NATHANIEL LAFON, a citizen of the United States, residing at Red Jacket, in the county of Mingo and State of West Virginia, have invented new and useful Improvements in Range-Rods, of which the following is a specification.

This invention relates to engineering instruments, and particularly to range-rods, the object of the invention being to provide a range-rod support having special and novel means whereby the range-rod after its primary adjustment or setting may be shifted bodily in a horizontal plane in any direction, so as to position the range-rod vertically directly in line with a given point.

With the above general objects in view the invention consists in the novel construction, combination, and arrangement of parts, as hereinafter fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a plan view of the instrument embodying the present invention. Fig. 2 is a vertical diametrical section through the same, taken in line with the range-rod. Fig. 3 is a detail cross-section through the joint of one of the tripod-legs. Fig. 4 is a detailed view of the range-rod.

Like reference-numerals designate corresponding parts in all the figures of the drawings.

The range-rod support resembles an ordinary surveying-tripod and embodies a centrally-apertured tripod-head plate 1, provided with downwardly-projecting lugs 2, to which the tripod-legs 3 are pivotally connected at the points 4. The head-plate 1 is provided with a large central aperture 5, and upon the flat upper surface of the head-plate 1 is placed an adjustable cap-plate 6, also flat and provided with a central aperture 7, which corresponds with the central aperture 5 of the head-plate 1, as clearly shown in Fig. 2.

The cap-plate 6 is provided at diametrically opposite points with pivots 8, upon the inner ends of which is supported a swivel-ring 9. This ring carries at diametrically opposite points pivots 10, which are arranged midway between the pivots 8 and which engage at their inner ends with trunnions 11, projecting laterally from a vertically-disposed range-rod 12, which passes through the apertures of the plates 1 and 6, as shown in Figs. 1 and 2.

Connected to the lower end of the range-rod 12 is a weight consisting of a hollow cylinder 13, filled with a weighty substance 14, such as mercury. The lower end of the cylinder 13 is exteriorly threaded to receive a cap-nut 15, and said nut is provided with an opening 16, extending therethrough to receive and retain the cord 17 of a plumb-bob 18. The upper end of the cord 17 is knotted or provided with an enlargement 19 to prevent its escape from the opening 16.

The cap-nut 15 provides for detaching the plumb-bob from the weighted end of the range-rod.

In order to render the cap-plate 6 adjustable in any direction on the head-plate 1, the head-plate is provided with upstanding stud-bolts 20, and the cap-plate is provided with relatively large openings 21, (indicated in dotted lines in Fig. 1,) through which said stud-bolts pass, the said openings being concentric with the stud-bolts and sufficiently larger than the stud-bolts to permit the plate 6 to be shifted horizontally in any direction and to the extent of a quarter of an inch or more. Clamp-nuts 22 are threaded upon the bolts 20 and engage washers 23, which bear against the upper surface of the cap-plate 6 and force said cap-plate into firm frictional engagement with the head-plate 1 of the tripod.

After setting the tripod and range-rod as accurately as convenient the clamp-nuts 22 are loosened, which allows the cap-plate 6 to be shifted to bring the range-rod to the exact position required, after which the clamp-nuts are tightened. The plumb-bob is found of considerable convenience in properly locating and positioning the range-rod; but if not particularly desired it may be dispensed with by detaching the nut 15, which connects the plumb-bob to the weighted end of the range-rod.

Having thus described the invention, I claim as new—

An engineering instrument comprising a tripod having a centrally-apertured disk-shaped head-plate and an upstanding stud-bolt, a centrally-apertured disk-shaped cap-plate resting on the head-plate and provided with an opening through which said stud-bolt passes, the opening being larger than the stud-bolt to permit a universal horizontal adjustment of the cap-plate on the head-plate, clamping means on said stud-bolt for

binding the cap-plate against movement on the head-plate, and a range-rod provided with oppositely-extending trunnions pivotally supported upon threaded horizontally-disposed pins, and said range-rod passing through the head and cap plates and having its lower end weighted.

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

NATHANIEL LAFON.

Witnesses:
Z. D. HOLBROOK,
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