

No. 624,362.

Patented May 2, 1899.

J. S. MILLIKIN & W. E. BOWEN.
LEVELING ROD.

(Application filed Apr. 22, 1898.)

(No Model.)

Fig. 1.

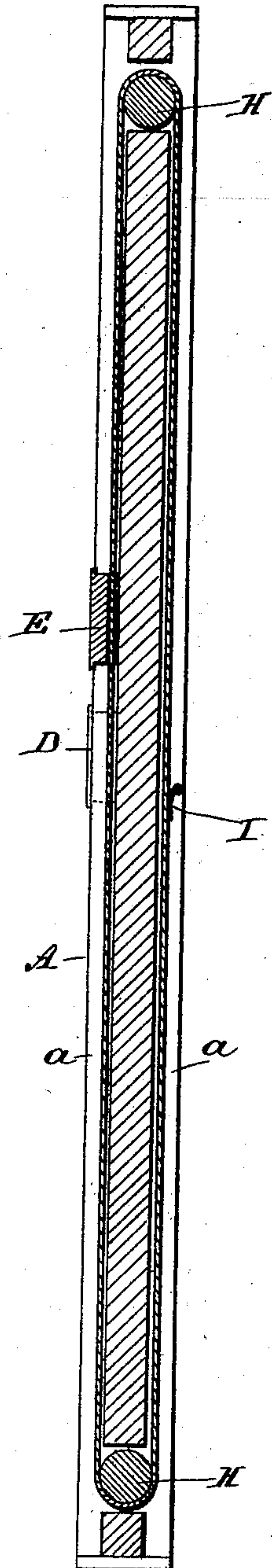


Fig. 2.

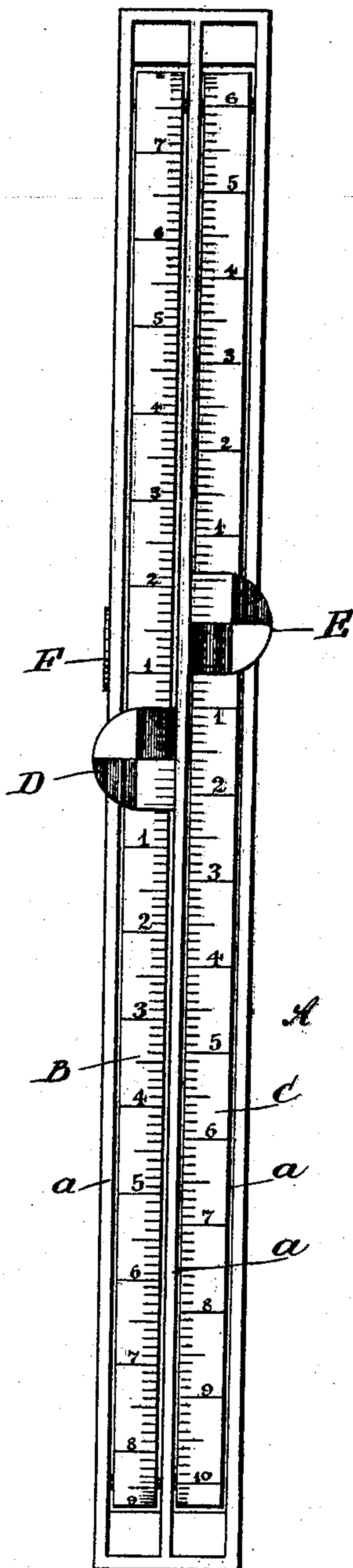
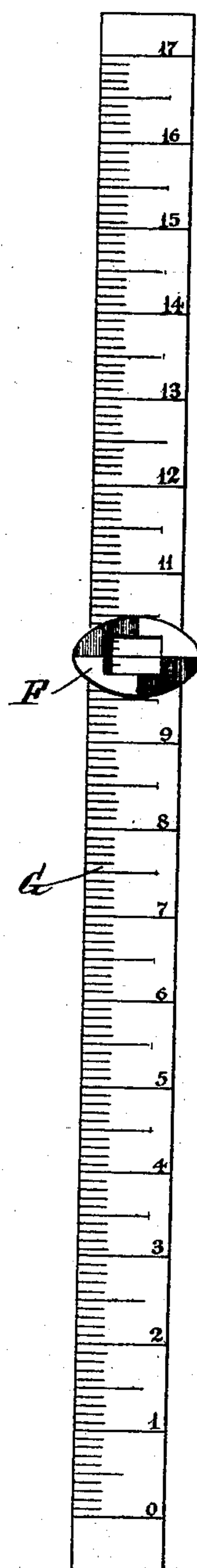


Fig. 3.



WITNESSES:

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LEVELING-ROD.

SPECIFICATION forming part of Letters Patent No. 624,362, dated May 2, 1899.

Application filed April 22, 1898. Serial No. 678,470. (No model.)

To all whom it may concern:

Be it known that we, JOHN S. MILLIKIN and W EUGENE BOWEN, of Ontario, in the county of Malheur and State of Oregon, have invented
5 a new and Improved Leveling-Rod, of which the following is a full, clear, and exact description.

Our improvement relates to leveling-rods, and has for its object to enable differences in
10 elevations between two points to be read directly on the rod without any computation.

The invention comprises a rod or support having two endless tapes mounted thereon and capable of adjustment longitudinally,
15 each tape having a target attached thereto and having a scale marked thereon reading from zero at the target in each direction.

The invention also consists of novel features of construction, which will be herein-
20 after described, and particularly pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indi-
25 cate corresponding parts in all the figures.

Figure 1 is a sectional elevation of our device. Fig. 2 is a front elevation, and Fig. 3 is a side elevation, of the same.

In using the ordinary leveling-rod it is nec-
30 essary to make a computation for each elevation taken in order to determine the elevation of that point above and below any particular point. In setting stakes for cutting or filling, which is a common job of leveling, it is nec-
35 essary to make a computation at each point to determine the amount of fill or cut necessary to bring the surface to the proper elevation. With our device it is possible to read the exact amount of cut or fill directly from
40 the rod without any computation. In consequence of this the work may be done more rapidly and with less possibility of mistakes. It is also possible for a person to use this rod and to work satisfactorily without having the
45 special training and education which is ordinarily necessary in doing this work by the present means.

Our rod consists of a body A, which is preferably made of wood and of any suitable length.
50 This body A is provided with recesses on opposite sides adapted to receive the tapes B

and C, so as to keep the outer surface of the tapes below the outer edges of the rod, thus preventing rubbing of the tapes upon any object and their consequent defacement. At
55 each end the body of the rod has a hole cut through it, connecting the opposite sides, within which hole are mounted the rollers H, which carry the tapes. The tapes are provided with targets D and E of any usual or preferred
60 construction. The tapes are scaled in each direction from the targets, the targets being placed at zero. It is evident that the tapes and the targets attached thereto may be readily elevated or depressed, as desired. In
65 using our device the target upon one of the tapes will be set to correspond with the grade desired. This target and the tape carrying it will be clamped in place, so it will not be
70 accidentally moved. The target upon the other tape will then be set at such an elevation as may be necessary to bring it in line with the level. As the tape is laid out in
75 each direction from the target at zero, the difference in elevation between the point where the rod is set and the required grade may be read directly from this tape and will
80 be plus or minus, as the target is below or above the target upon the other tape. In this way it may be determined at once whether a cut or fill is necessary and the exact amount of the same. The tapes B and C may be made of any suitable material, as cloth or metal.

For convenience, where it is desired to use
85 the rod as an ordinary leveling-rod, one side edge thereof may be laid out with the usual scale G and target F. This scale G will be used in the ordinary manner. The flanges or beads *a* upon each side of the tapes B and
90 C serve to protect the figures upon the tape from accidental contact with other bodies and from being in consequence rubbed off or disfigured. Any convenient clamping means may be used to secure one or the other of the
95 tapes in position—for instance, as shown in Fig. 1, a spring I, attached to one of the flanges *a* and bearing upon the tape. The use of double tapes, as herein described, enables leveling to be done more rapidly than
100 possible with an ordinary rod and increases the accuracy of the work, as well as render-

ing it possible for any person of ordinary intelligence to become proficient in the use of the same in a very short time.

Having thus described our invention, we
5 claim as new and desire to secure by Letters Patent—

1. A leveling-rod having two independently-movable endless tapes located side by side on the same face of the rod and figured
10 from zero in opposite directions, axially-aligning rollers at each end of the rod and carrying the tapes, and a target secured to each tape at zero, substantially as described.

2. A leveling-rod having two independently-movable endless tapes located side by side on the same face of the rod and figured
15 from zero in opposite directions, a target secured to each tape at zero, rollers mounted upon each end of the rod and carrying the tapes, and means for clamping one of the tapes
20 to the rod, substantially as described.

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Witnesses:

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