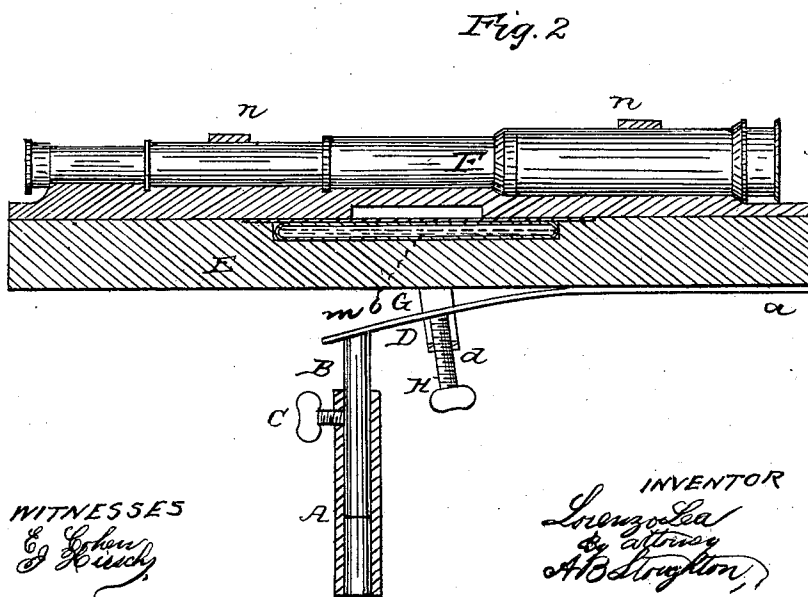
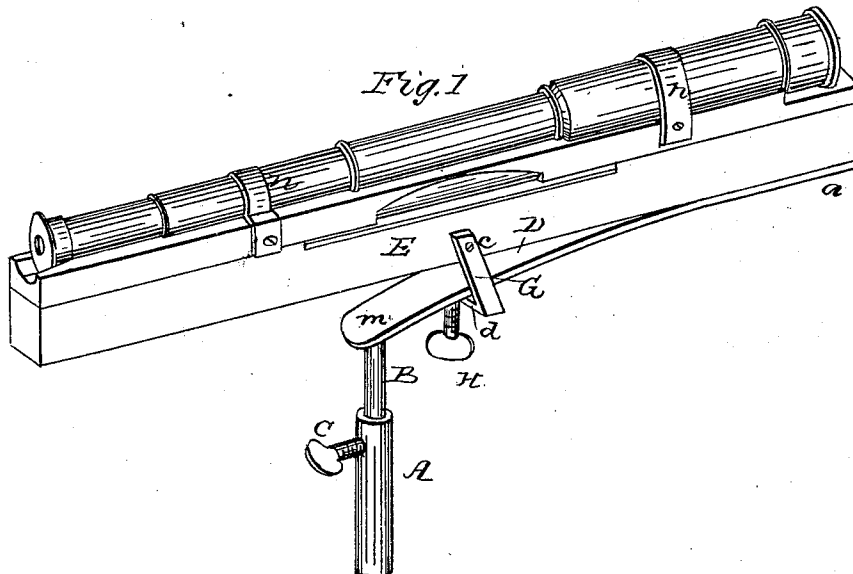


L. LEA.
Leveling Instrument.

No. 29,703.

Patented Aug. 21, 1860.



UNITED STATES PATENT OFFICE.

LORENZO LEA, OF JACKSON, TENNESSEE.

SURVEYOR'S LEVELING INSTRUMENT.

Specification of Letters Patent No. 29,703, dated August 21, 1860.

To all whom it may concern:

Be it known that I, LORENZO LEA, of Jackson, in the county of Madison and State of Tennessee, have invented certain new and 5 useful Improvements in Leveling Instruments; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1, represents a perspective view of said leveling instrument. Fig. 2, represents a longitudinal vertical section through the same leaving telescope in full.

15 My invention relates to the manner of connecting the bubble and telescope of a leveling instrument with a vertical spindle by means of a curved spring and in connection therewith a single set screw which together with said spring will adjust the position of the level in relation to the stationary spindle.

To enable others skilled in the art to make and use my invention I will proceed to 25 describe its construction and operation.

A represents a socket which is secured to the top of the supporting staff or tripod of the instrument, and into which the spindle B is inserted and wherein it is secured at 30 any desired elevation by means of the set screw C, or by a shoulder or collar.

D represents a strong curved spring the lower or inclined end *m* of which is secured to the upper end of the spindle, B, while its 35 horizontal end, *a*, is secured to the lower side of the level or bubble block E in which a bubble, *b*, of any of the usual constructions is inserted.

The telescope F for making the observations is secured on the top of the bubble block E and can be made adjustable thereon by raising or lowering either end by strips of thin card, paper, or metal, and then held by screws or straps *n*.

45 G represents a stirrup which is secured to the sides of the bubble block E by means of the screws, *c*, and which passes around the

inclined part of the spring, D; the set screw H passes through the horizontal bar *d*, of the stirrup G and its end bears on the lower 50 side of the spring D, so that by turning the set screw in one or the other direction the position of the level and telescope is adjusted or leveled. It will be observed that the end, *m*, of the spring D is secured to the 55 spindle B and forms an obtuse angle with it; the object of this arrangement being to adjust the level and telescope to a horizontal position by means of the set screw H, if, the supporting staff should not stand in a perpendicular position. This can be effected 60 by turning the set screw H in one or the other direction. On turning it so as to force it against the spring, D, the thick end of the telescope will be raised, on turning the set 65 screw so as to recede from the spring the thick end of the telescope will be lowered and it thus can be adjusted to a level with the greatest accuracy by simply turning the single set screw H, and the tedious operation 70 of adjusting the supporting staff to a perpendicular line is entirely obviated.

The staff or tripod may be of any ordinary well known kinds. The whole instrument is cheap, and for ordinary purposes sufficiently 75 accurate, while its simplicity of construction and operation, and adjustment when necessary makes it a valuable instrument.

Having thus fully described the nature of my invention what I claim herein as new, 80 and desire to secure by Letters Patent, is—

Connecting the bubble block and telescope of a leveling instrument with the tripod or supporting staff, by means of a curved spring in combination with a single set screw 85 for the purpose of adjusting the position of the level in relation to the supporting staff or tripod substantially in the manner herein described.

LORENZO LEA.

Witnesses:

A. B. STOUGHTON,
E. COHEN.