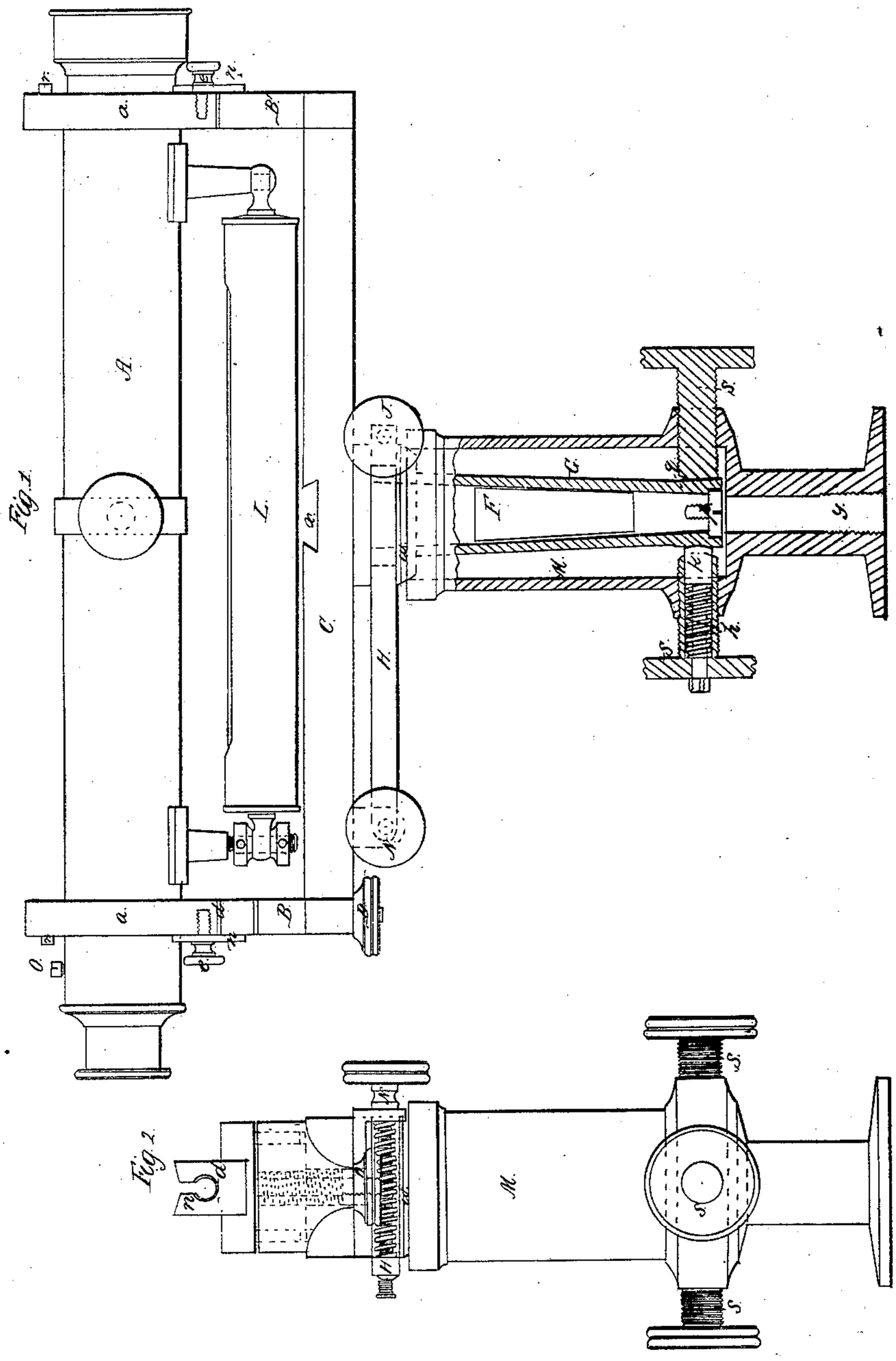
C. Becker.

Levelling Instrument.

No. 18,728. Patented Dec. 1, 1857.



UNITED STATES PATENT OFFICE.

CHRISTOPHER BECKER, OF BROOKLYN, NEW YORK.

SURVEYING-LEVEL.

Specification of Letters Patent No. 18,728, dated December 1, 1857.

To all whom it may concern:

Be it known that I, CHRISTOPHER BECKER, of the city of Brooklyn, in the State of New York, have invented a new and Improved Surveying-Level; and I hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference thereon.

Figure I represents a side view of the instruments, with the lower part in section. Fig. II is an end view with the telescope removed. Fig. III is a top view of the cross bar and supporters, and Fig. IV shows the spider's thread arrangement.

The nature of my improvement consists in the simplicity and greater accuracy of my instrument, in the manner of supporting the telescope, the arrangement of the spider's thread, and in the construction of the tangent and micrometer screws, as well as in the arrangement of setting the instrument by the application of screws directly upon the conical axis of the same.

A, is an achromatic telescope fixed in perfectly square plates, *a*, *a*, resting upon two supporters, B, B′, attached to a strong bar, C, on which a provision, *x*, is made to carry a compass if desired. One of the supporters, B, is made in two pieces, capable of being raised or lowered by means of the screw D.

The square plates, *a*, *a*, of the telescope rest upon the supporter, B, only on one small surface, *d*, and upon the supporter B′ upon two small surfaces *d′*, *d″*, and said telescope is held in its place by the screws *e*, *e*, fitted in holes in suitable projections *n*, *n*, attached to the supporters B and B′.

r, *r*, are small pins fixed, in the upper side of the telescope, in the plates *a*, *a*, and fit in the projections *n*, *n*, to guide the telescope when the same requires to be turned round for the purpose of regulating the spider threads or the line of collimation.

L is the spirit level fixed to the telescope in the usual manner.

By this arrangement of supporting the telescope, we obtain greater accuracy as the same rests upon three points or small surfaces *d*, *d′*, *d″*,—one of which, *d*, is capable of being raised or lowered by the screw D, and is fixed in that position by the screws *e*, *e*, but which said screws do not produce any pressure upon the telescope.

To the center of the cross bar, C, a conical axis F is firmly attached, fitted into the socket G and attached to the same, but capable of turning, by the screw, *p*. To the upper end of the socket, G, and directly underneath the cross bar, C, is the tangent lever, H, attached, which can be made to embrace this socket tightly by turning the clamping screw J, the other end of this tangent lever is acted upon by the tangent screw, N, attached to the cross bar, C, and through which a slow horizontal motion may be given to the instrument.

The socket, G, has directly below the tangent lever a circular collar, *w*, fitting upon the bevel edge of the case M, and the lower end *q* of the socket is made square for the set screws S to act upon. This square *q* is made a little larger at the lower part, so as to pull down the socket into the case M while being acted upon by the set screws. At the bottom of the case M is a female screw, *y*, to attach the instrument to the staff head. Two of the set screws, S, have a small piston, *k*, acted upon by spiral springs, *p*, to prevent any back lash of the screws.

The tangent screw, N, and the micrometer screw D are acted upon by spiral springs to insure the certain motion of the same and prevent any dead movement. The spider threads are fixed to a small frame, *g*, capable of sliding in guides, 2, 2, on the end of a tube Z, fitting tight into the telescope. On the upper end of the frame, *g*, a small projection, 3, is made acted upon by a spring, 5, so as to press this frame upwards. A leg, *m*, is provided on the tube Z by which the same is fixed to the tube of the telescope through the screw, O. This screw, O, after falling through the lug, *m*, acts upon the projection, 3, and regulates thereby the position of the spider thread.

The advantages of this construction of a surveying level are first that adjustment of the spider threads is produced by the action of only one screw. Secondly by the manner of supporting the telescope on three points, and fastening the same by means of screws, without producing any pressure upon the telescope, I insure in every position, the same may be placed, a true bearing, having always square surfaces to depend upon. Thirdly by the arrangement of the set screws acting directly upon the the axis of the instrument, I insure a greater stability, as I obtain a greater leverage, than by the arrange-

ment of the two parallel plates commonly used for that purpose.

What I claim as my invention and desire to secure by Letters Patent is—

1. The constructing of the telescope with square surfaces, *a*, *a*, resting upon small points or surfaces upon the supports, and attached to the same in the manner and for the purpose described.

2. I claim. The arrangement, construction and manner of operating the spider thread by one screw only, as described.

3. I claim the arrangement of the set screws S acting directly upon, and square to the axis of the instrument in the manner specified.

4. I claim the arrangement and construction of the micrometer and tangent screws, so as to prevent any dead movement in the manner described.

CHRISTOPHER BECKER.

Witnesses:

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