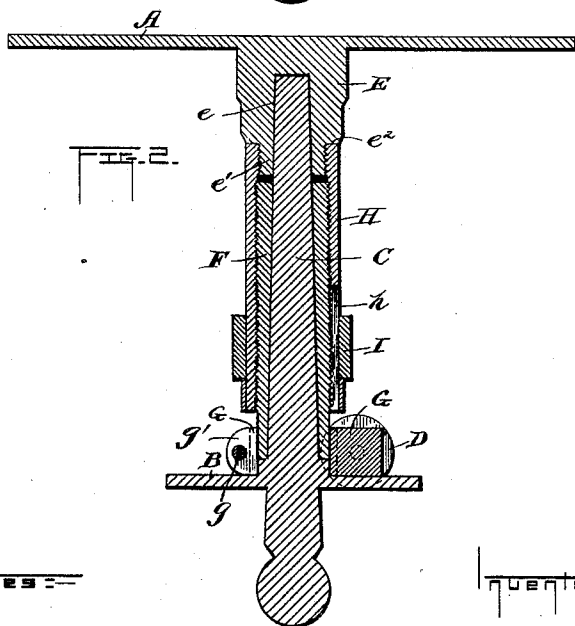
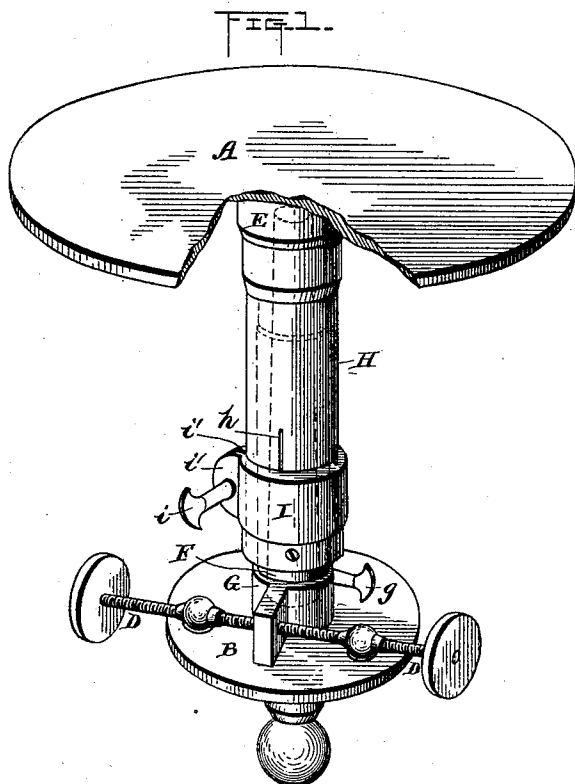


(No Model.)

J. R. HANLON.
SURVEYOR'S INSTRUMENT.

No. 430,015.

Patented June 10, 1890.



Witness.
Theodore S. West

John R. Hanlon,
By *L. Deane,*
his Attorney.

UNITED STATES PATENT OFFICE.

JOHN RUSSELL HANLON, OF PENNINGTON, NEW JERSEY.

SURVEYOR'S INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 430,015, dated June 10, 1890.

Application filed February 15, 1890. Serial No. 340,567. (No model.)

To all whom it may concern:

Be it known that I, JOHN RUSSELL HANLON, a citizen of the United States, residing at Pennington, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Surveyors' Instruments; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to improvements in the stands of theodolites and field-transits, the object being to provide means whereby the telescope can easily have its height adjusted after the instrument has been leveled; and it consists in the construction, arrangement, and novel combination of parts hereinafter described, illustrated in the drawings, and particularly pointed out in the appended claims.

In the accompanying drawings, in which similar letters of reference designate corresponding parts, Figure 1 represents a perspective view of the top or head of a theodolite or transit stand embodying the invention. Fig. 2 represents a central vertical section thereof.

The instruments in question are usually mounted on tripods, and the height desired is obtained by moving the legs of the tripod nearer together or farther apart, after which the plates are leveled. The leveling of the plates frequently changes the height, so that it is sometimes necessary to readjust the instrument several times before it can be leveled at the desired height. By means of my invention this is obviated, as the telescope has its height accurately adjusted after being leveled.

Referring to the drawings by letter, A designates the limb or upper plate of the instrument, B the lower or leveling plate, C the spindle rising from the plate B, and D D the adjusting-screws, all of ordinary construction.

E is a boss depending from the limb or upper plate and recessed at *e* to receive the upper end of the spindle, which is tapered slightly upward from the lower plate B. The said boss has its lower portion *e'* threaded

externally and reduced in diameter below the circumferential shoulder *e*².

F is a cylindrical sleeve fitting on the spindle below the said boss and turning thereon. G is a clamping-collar surrounding said sleeve at its lower end above the plate B, and *g* is a clamping-screw engaging in suitable openings in the lugs or ears *g' g'* of said collar, in order to bind the sleeve, when necessary, on the spindle and prevent it turning thereon.

The outer surface of the sleeve F above the clamp G is screw-threaded to engage the similarly-threaded interior surface of an outer cylindrical sleeve H, the upper end of which screws upon the threaded part *e'* of the boss E and abuts against the shoulder *e*².

The sleeve H is provided with the longitudinal slits or slots *h h*, extending upward from its lower end to a suitable height, and preferably three in number and equidistant.

I is a clamping-collar, similar to the collar G, surrounding the sleeve H over said slits, and *i* is a clamping-screw engaging in suitable openings in the ears or lugs *i'* of said clamp to bind the outer sleeve on the inner sleeve and prevent it from rotating thereon. The slits *h* in the outer sleeve enable the clamp I to bind said sleeve on the inner sleeve and prevent it turning thereon.

When the clamp G is loosened, the instrument can be turned laterally to any desired angle.

The operation of the invention is as follows: Tighten the clamp G to prevent the inner sleeve from turning on the spindle. Then loosen the clamp I and screw the outer sleeve up to any desired height on the inner sleeve. Then tighten the clamp I and loosen the clamp G, and the instrument may then be turned laterally to any desired angle, the height of the telescope remaining unchanged.

The device is of simple construction, and by it much trouble and time may be saved in the use of the theodolite and transit.

Having described my invention, I claim—

1. The combination of the outer internally-threaded sleeve with its upper end attached to the limb or upper plate, the inner externally-threaded sleeve engaged within the

outer sleeve, and a suitable clamp by means of which the outer sleeve may be prevented from turning on the inner sleeve, substantially as specified.

5 2. The combination of the outer internally-threaded sleeve H, provided with longitudinal slits extending upward a suitable distance from its lower end, the limb or upper plate attached to the upper end of said outer
10 sleeve, the inner externally-threaded sleeve engaging in the outer sleeve, and the clamping-collar surrounding the outer sleeve over the slits, substantially as specified.

15 3. The combination, with the spindle rising from the lower plate, the inner externally-threaded sleeve rotatable on the spindle, and the clamping-collar surrounding said sleeve below its threaded portion and just above the lower plate, of the outer internally-threaded
20 sleeve provided with slits extending upward

a sufficient distance from its lower end, the upper plate secured to the upper end of the outer sleeve, and the clamping-collar surrounding the outer sleeve over the slits, substantially as specified.

25 4. The combination, with the outer vertical longitudinally-split and internally-threaded outer sleeve and the limb or upper plate detachably secured to the upper end of said sleeve, of the inner externally-threaded sleeve
30 engaged within said outer sleeve and a suitable clamp to bind the two sleeves together and prevent independent rotation, substantially as specified.

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

JOHN RUSSELL HANLON.

Witnesses:

JOHN W. ATKINSON,
CHARLES E. BIKLÉ.