

No. 622,045.

Patented Mar. 28, 1899.

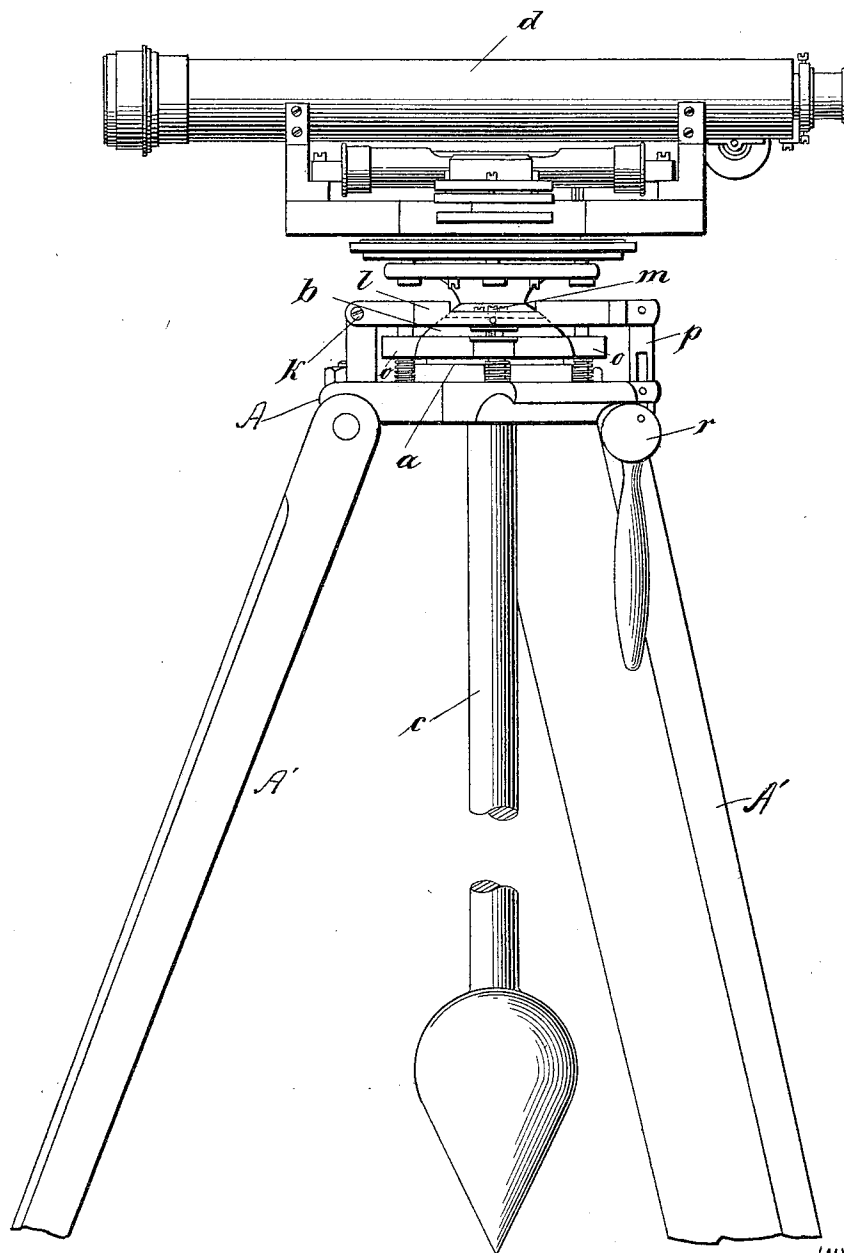
A. HEIN.

SURVEYING OR ASTRONOMICAL INSTRUMENT.

(Application filed May 14, 1898.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

Ludwig Wipf
Hermann Pfaffel.

Fig. 1.

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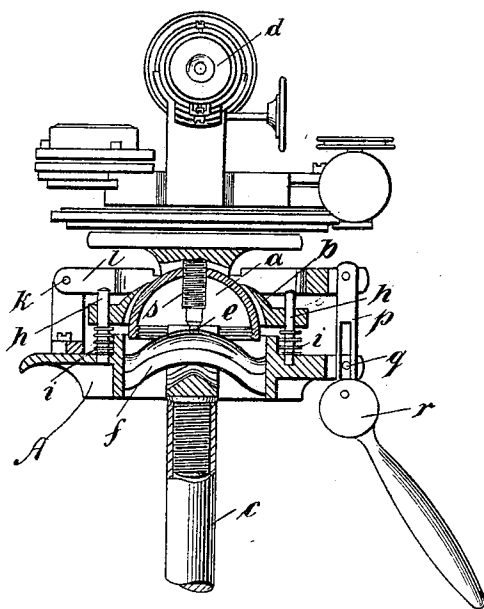


Fig. 2.

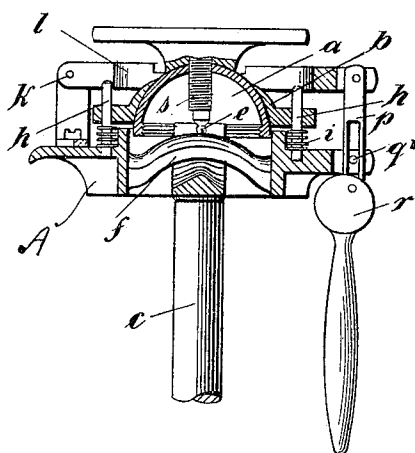


Fig. 3.

WITNESSES:

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UNITED STATES PATENT OFFICE.

ADOLF HEIN, OF HAGEN, GERMANY.

SURVEYING OR ASTRONOMICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 622,045, dated March 28, 1899.

Application filed May 14, 1898. Serial No. 680,690. (No model.)

To all whom it may concern:

Be it known that I, ADOLF HEIN, engineer, of Hagen, Westphalia, in the German Empire, have invented certain new and useful Improvements in Surveying or Astronomical Instruments, of which the following is a specification.

This invention relates to surveying, astronomical, and kindred scientific instruments; and the object of the invention is to provide means for setting the instrument firmly against dislocation when its proper adjustment has been secured.

The invention consists in the combination, with the table of a surveying instrument, of a plumb-rod, a hemispherical head on said plumb-rod, means for pivotally supporting said head adjacent to said table, means on said head for supporting a surveying instrument, a clamping-ring supported on springs above said table, a lever for depressing said clamping-ring into contact with the head, said lever bearing on said clamping-ring at diametrically opposite points of the same, and means for locking said lever in depressed position on said bearing-ring, and, further, in the specific means for supporting and guiding said clamping-ring and for adjusting said head relatively thereto for regulating the pressure of the ring on the head, as will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a surveying instrument and tripod provided with my improved means for setting the same. Fig. 2 is a sectional view showing the clamping-ring raised from the hemispherical head, and Fig. 3 is a sectional view showing the clamping-ring depressed and locking the instrument in the position in which it has been set by the plumb.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the table of a surveying instrument, such as a level, and A' A' two of the three legs for supporting the table. The table A is provided with a central aperture, across which extends the bow-shaped bridge f, which carries upon its raised middle portion a bearing-point, preferably a ball e. Upon this bearing-point e

s, which is adjustable in the hollow hemispherical head a of the plumb-rod c, said screw serving to regulate the height of the head relatively to the table A and to the clamping means supported above said table and hereinafter described. At its upper end said screw s is provided with a broad head, upon which are supported the telescope d and other parts of the surveying instrument. Above the table of the instrument is guided on pins h a concaved clamping-ring o, which is provided with an upwardly-extending flange b and supported by helical springs i on said pins h. Above said clamping-ring o is arranged a lever l, which is pivoted at one end, at k, to an upright standard supported on the table A. From the other end of the lever extends in downward direction a link p, which is guided at its lower slotted portion on a pin q, fixed in the table A. The lever l is provided at each side at points diametrically opposite across the bearing-ring with bearing-pins m. To the lower end of the link p is pivoted a cam-lever r, which is retained through the tension of the springs i against the underside of the table A, with the handle dropped normally in the released position of the clamping-ring, as shown in Fig. 2.

The tripod having been located in the desired spot and the plumb having come to a stop, to set the instrument rigidly in its proper position all that is necessary is to press the lever r in under the table of the instrument into the position shown in Fig. 3. The cam-lever is retained in that position by frictional contact with the table. By this operation the lever l is drawn down, bringing with it the clamping-ring against the tension of the springs i, so that the ring and its flange b contact with the hemispherical head of the plumb-rod and prevent movement of the plumb and of the instrument supported on the pivot-screw s. To release the instrument it is only necessary to pull out the cam-lever r. The lever l being thereby released, the springs i raise the same, together with the clamping-ring, from the surface of the hemispherical head, and the plumb is free to sway and reset the instrument if the position of the tripod be changed. By means of the set-screw s it is possible to raise or lower the hemispherical head a relatively to the clamp-

ing-ring and thereby regulate the pressure to be put on the same when the cam-lever is operated. There are preferably employed four pins *h* with the corresponding springs *i*, and these four pins are arranged at the four points of a square or diamond, the forward pin being arranged opposite the link and the rear pin diametrically opposite to the forward pin across the hemispherical head. The bearing-pins *m* are then located on the lever *l*, so that they bear on the clamping-ring at points opposite the side pins *h* and at points diametrically opposite on the clamping-ring. By the employment of this or an equivalent regular disposition of the pins *h* and springs *i*, together with the use of the bearing-pins *m* at proper points, there is obtained a direct downward thrust of the clamping-ring, which firmly sets the instrument in the exact position into which it has been brought by the plumb without the slightest sidewise dislocation.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the table of a surveying instrument, of a plumb-rod, a hemispherical head on said plumb-rod, means for pivotally supporting said head adjacent to said table, means on said head for supporting a surveying instrument, a clamping-ring supported on springs above said table, a le-

ver for depressing said clamping-ring into contact with the head, said lever bearing on said clamping-ring at diametrically opposite points of the same, a link extending from said lever, means on said table for guiding said link, and a cam-lever pivoted to said link and bearing at its cam portion against said table for locking said lever in depressed position on said bearing-ring, substantially as set forth.

2. The combination, with the table of a surveying instrument, of a plumb-rod, a hollow hemispherical head on said plumb-rod, a pivot-screw adjustable in said head and supported on a bearing-point on said table, means on said head for supporting a surveying instrument, upright pins on said table, springs on said pins, a clamping-ring guided on said pins, a lever for depressing said clamping-ring into contact with said head, a link extending from said lever, means on said table for guiding said link, and a cam-lever pivoted to said link and bearing at its cam portion against said table for locking said clamping-ring in depressed position, substantially as set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

ADOLF HEIN.

Witnesses:

EDWIN WEISS,
HERMANN BARTUP.