2 Sheets—Sheet 1.

W. GURLEY.

Tripod Head for Surveying Instruments.

No. 208,732. Patented Oct. 8, 1878.

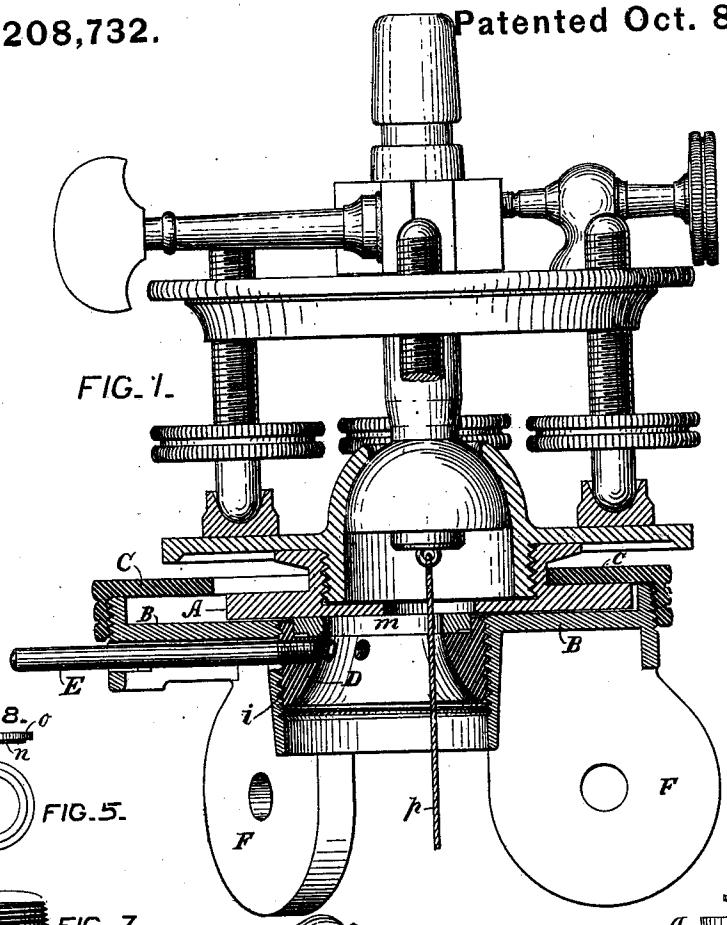


FIG. 1.

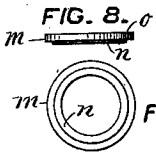


FIG. 8.

FIG. 5.



FIG. 7.

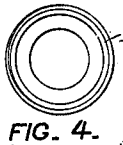


FIG. 4.



FIG. 6.

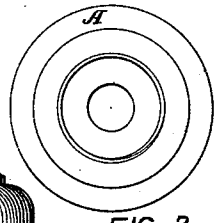


FIG. 3.

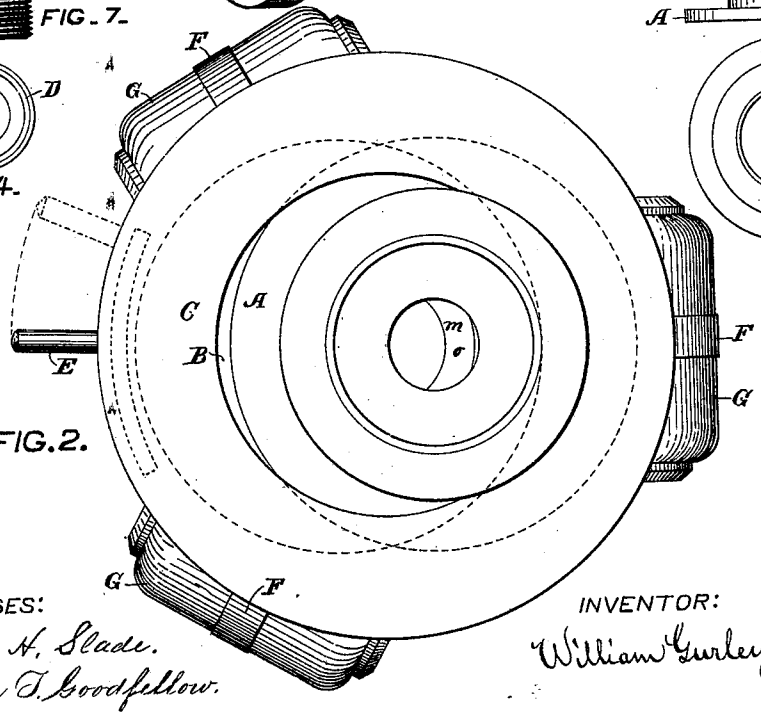


FIG. 2.

WITNESSES:

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James T. Goodfellow.

INVENTOR:

William Gurley

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

2 Sheets—Sheet 2.

W. GURLEY.

Tripod Head for Surveying Instruments.

No. 208,732. Patented Oct. 8, 1878.

FIG. 9.

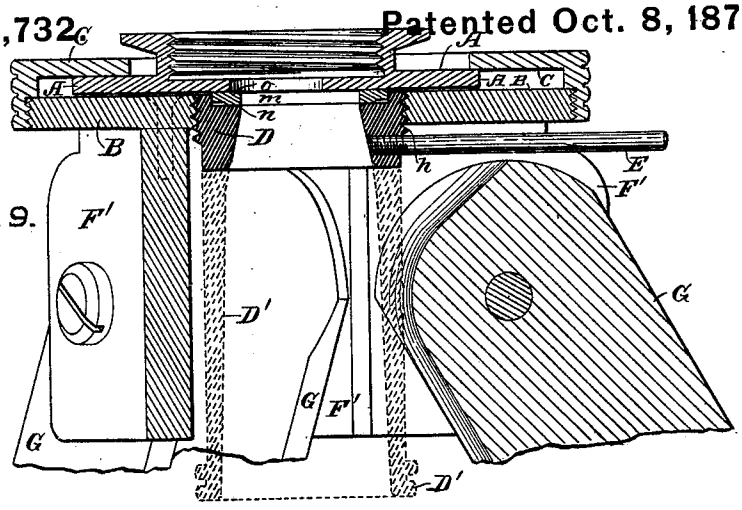


FIG. 10.

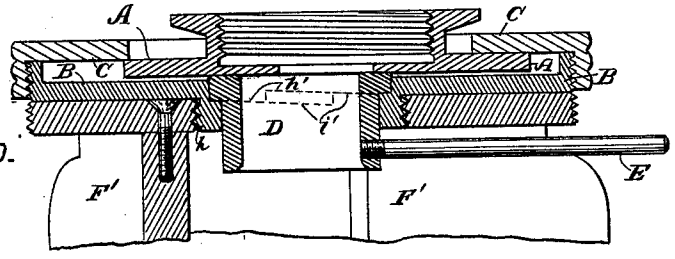


FIG. 12.

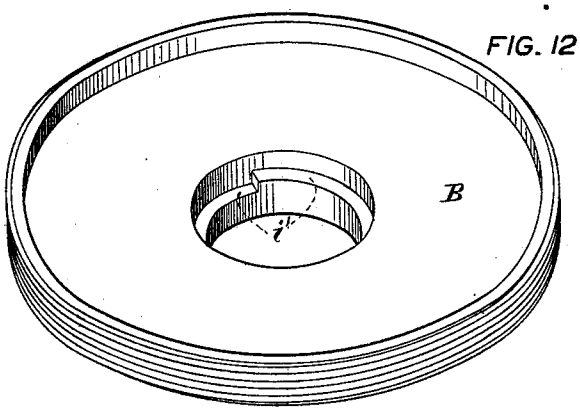


FIG. 13.

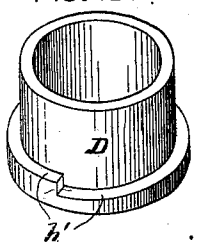
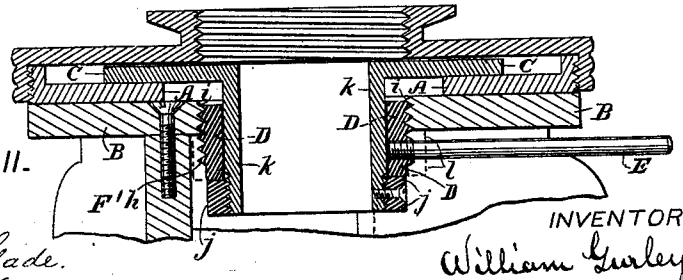


FIG. 11.



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James A. Slade.

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UNITED STATES PATENT OFFICE.

WILLIAM GURLEY, OF TROY, NEW YORK, ASSIGNOR TO W. & L. E. GURLEY, OF SAME PLACE.

IMPROVEMENT IN TRIPOD-HEADS FOR SURVEYING-INSTRUMENTS.

Specification forming part of Letters Patent No. **208,732**, dated October 8, 1878; application filed September 9, 1878.

To all whom it may concern:

Be it known that I, WILLIAM GURLEY, of the city of Troy, in the county of Rensselaer and State of New York, have invented a new and useful Improvement in Tripods for Instruments for Surveying, Engineering, and other purposes, of which invention the following is a specification, reference being had to the accompanying drawings.

The general object of this invention is to produce a simple, strong, and durable device whereby a surveying or engineering instrument, mounted on a tripod furnished with such a device, can be quickly and firmly adjusted laterally to set its center or plummet vertically over a fixed point on the ground without the use of the leveling-screws of an ordinary tripod-head, and without having any clamping-screws outside of the inner circle of the leg-holding cheeks or lugs of the tripod, and without requiring any material enlargement of the usually narrow central space between those cheeks or lugs, nor any laterally-sliding plate under the usual tripod-plate to which such lugs or cheeks are secured. This object is attained by the devices represented in the aforesaid drawings, in which—

Figure 1 is a sectional elevation, showing one form of my improved adjusting device, with a common tripod-head mounted thereon. Fig. 2 is a plan of the same without the head. Figs. 3, 4, and 5 are plans, and Figs. 6, 7, and 8 elevations, of detached parts of the same, drawn to a smaller scale. Figs. 9, 10, and 11 show sectional elevations of some modifications of the same device applied to a common tripod for surveying or engineering instruments; and Figs. 12 and 13 are isometrical views of parts of the device shown in Fig. 10.

A is a plate, to the upper side of which any suitable surveying or engineering instrument or head for supporting such instrument is to be screwed fast, as shown in Fig. 1, or otherwise suitably secured. B is a plate under the plate A, and adapted to support the latter; and close over the plate A is a plate, C. The plates A, B, and C are so constructed and arranged together that while the plate A can have only very small up and down movement between the plates B and C, it can be moved a considerable distance laterally to and fro in every direction between those plates.

I combine with the lower plate, B, upper plate, C, and intermediate laterally-movable instrument-plate, A, a central circular screw-like clamp, D, capable of being turned to and fro about its axis, and thereby giving powerful endwise pressure, so as to firmly fasten and easily release the sliding plate A in whatever position that plate shall be placed between the two other plates.

The clamp D can be turned to and fro by hand by having it extend downward between the legs of the tripod, as indicated by dotted lines at D′ in Fig. 9, or by having any suitable device secured to or connected with the clamp D, and extending downward or outward into convenient position to be moved by hand. I, however, generally prefer to have a lever, E, secured to the clamp D, and extending therefrom outward between the lugs F or cheeks F′, to which the legs G are pivoted, substantially as represented in Figs. 1, 2, 9, 10, and 11.

In this invention the clamp D engages with or abuts against the lower plate, B, so that by turning the part D in one direction the movable instrument-carrying plate A will be pressed and held firmly against the upper plate, C, as in Figs. 1, 9, and 10, or against the lower plate, B, as in Fig. 11, and so that by turning the part D in the opposite direction the plate A will be released.

I commonly prefer to have the clamp D formed on its outside with a regular screw-thread, *h*, fitting in a corresponding screw-thread, *i*, in or through the plate B, as represented in Figs. 1, 9, and 11, or to have the part D formed with an inclined, spiral, or screw-like flange or bearing, *h′*, Fig. 13, fitting, as in Fig. 10, to turn to and fro against or upon a corresponding inclined bearing, *i′*, Fig. 12, in or upon the lower plate. I also commonly prefer to have the clamp D bear endwise against the lower surface of the sliding plate A, as shown in Figs. 1, 9, and 10, and thereby force upward and clamp fast that plate against the top plate C, or to have the part D bear endwise upon a collar, *j*, Fig. 11, on a neck, *k*, on the upper plate, C, so as to

thereby press that plate downward, and thus clamp fast the sliding plate A upon the lower plate.

In carrying out this invention, when the plate C has the neck *k*, as in Fig. 11, that neck can have an exterior screw, engaging with an internal screw in the surrounding part D, while that part has an exterior screw, *h*, engaging with the screw *i* in the plate B, or has its upper end bearing against the under side of that plate, as indicated by dotted lines *l*, Fig. 11, so that by then turning the part D to and fro the top plate, C, will be pressed down hard and loosened upon the sliding plate A, so as to clamp fast and release the plate A upon the plate B.

In the construction shown by Figs. 1, 9, and 10, I generally prefer to have the part D formed or furnished with a washer, *m*, Figs. 1, 5, 8, and 9, which has the surface *n*, that bears against the part D, smaller than the surface *o*, which bears against the plate A, as shown in Figs. 1 and 9, so that the turning of the part D shall have less frictional tendency to turn that plate than when the washer is absent.

The parts are formed with central apertures, through which the plummet-line *p*, Fig. 1, of the tripod-head or instrument can hang free, in whatever lateral position the sliding instrument-supporting plate A shall be adjusted.

In this invention the common tripod-plate, which has the leg-holding lugs F or cheeks F′ fast thereon, can constitute the lower plate, B, of this shifting device, as shown in Figs. 1, 9, and 11, or the plate B can be secured upon the tripod-plate, as represented in Fig. 10.

It will be observed that my above-described improved centering device for tripods does not require any leveling-screws to clamp it fast, nor any outside clamping-screws, nor any plate to slide laterally under the usual plate from which the leg-holding cheeks or lugs extend downward; and that my above-described invention is directly applicable to the common tripods in general use for surveying and engineering instruments, as above set forth.

What I claim as my invention is—

The combination of the lower plate, B, upper plate, C, intermediate laterally-movable instrument-plate, A, and the clamp D, substantially as described.

In testimony whereof I hereunto set my hand in the presence of two subscribing witnesses this 6th day of September, 1878.

WILLIAM GURLEY.

Witnesses:

PAUL COOK,

ROBERT GREGG, Jr.