W. GURLEY.

Tripod for Surveying Instruments.

No. 205,481. **Patented July 2, 1878.**

FIG. 1.

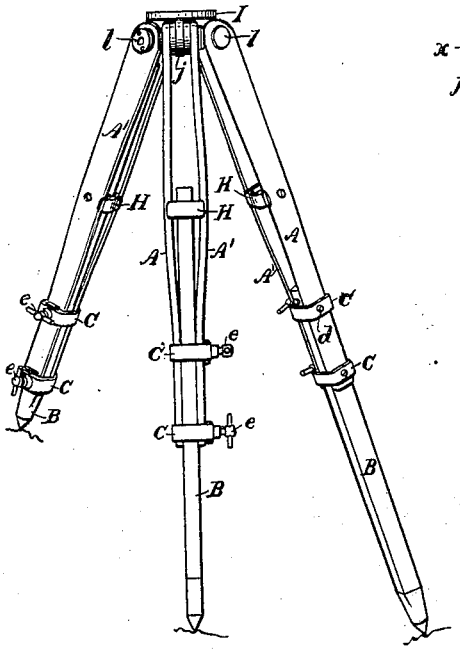


FIG. 2.

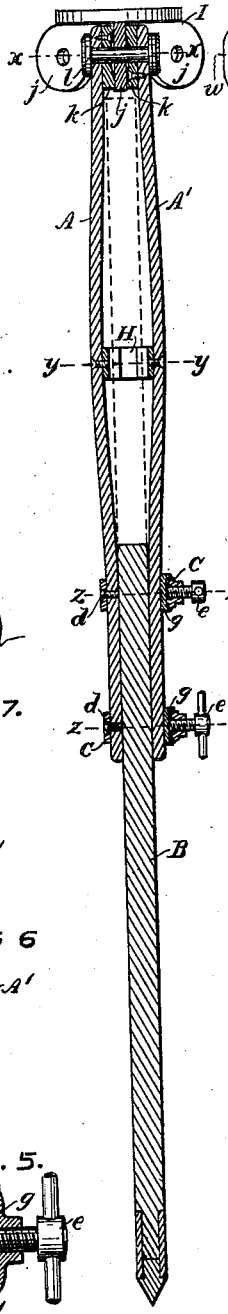


FIG. 3.

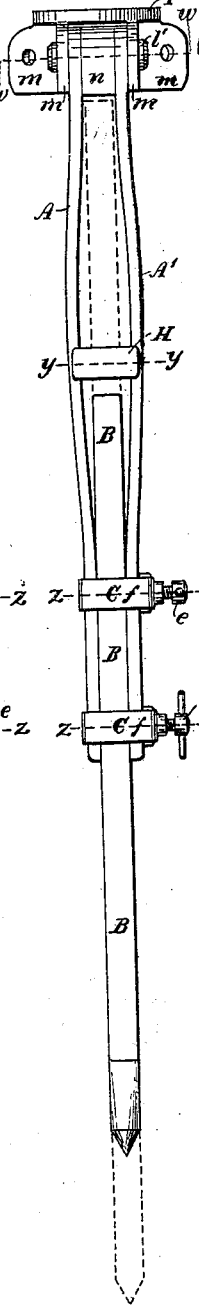


FIG. 4.

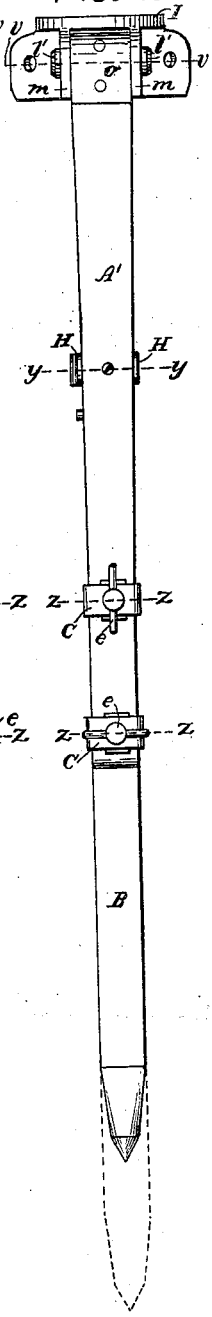


FIG. 7.

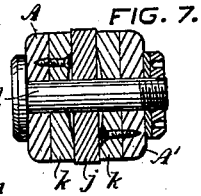


FIG. 8.

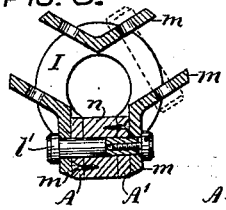


FIG 6

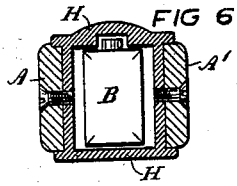


FIG. 9.

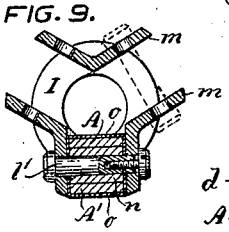
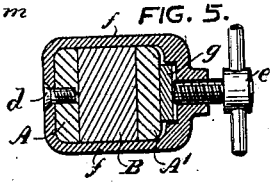


FIG. 5.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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

IMPROVEMENT IN TRIPODS FOR SURVEYING-INSTRUMENTS.

Specification forming part of Letters Patent No. **205,481**, dated July 2, 1878; application filed October 24, 1877.

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 certain Improvements in Tripods for Surveying and Leveling Instruments, Cameras, &c., of which the following is a specification, reference being had to the accompanying drawing.

Tripods have heretofore had legs variously constructed, so that the latter could be adjusted to different lengths; and a tripod-leg has been heretofore devised with two opposite parallel upper side strips, united at their tops, and surrounded and retained together, but apart from each other at their lower ends, by an angular band-like socket, through which and between the two side strips a lower end rod was fitted to slide endwise and lengthwise of the side strips, and had on its upper end part a screw-clamp, by which the upper end part only of the said sliding rod could be clamped tightly to the said side strips, no means being provided for clamping the lower end portion of the said side strips to, upon, or against the said sliding end rod; and consequently the latter was liable to be loose and shaky between the lower end portion of the side strips, especially when somewhat worn, and therefore such legs would be very defective for use in tripods for supporting accurate surveying and leveling instruments.

I avoid that defect by one part of my present invention, which consists of a tripod-leg having a lower end rod arranged and movable endwise between and lengthwise of two opposite upper side strips, adapted to be pivoted at their upper ends to a tripod-head of a kind suitable for surveying-instruments, and furnished with two separate screw-clamps, arranged around and fitted to the lower portion of the said side strips and the intervening end rod, and secured at a distance apart to one of the side strips, substantially as hereinafter explained, and shown in the aforesaid drawing, whereby the said end rod can be easily and quickly adjusted to any desired length beyond the lower ends of the side strips, and firmly clamped by and between the lower portion of the latter, without any looseness or shaking, although the parts shall have become much worn by use.

A further part of this invention consists of a tripod-leg having a lower end rod arranged and movable endwise between and lengthwise of two opposite side strips of bow form, and adapted to be pivoted at their upper ends to a tripod-head, and furnished with two separate screw-clamps, surrounding the lower portion of the side strips and intermediate sliding end rod, and with a hollow brace arranged between and secured to the middle portion of the two side strips, so as to support and retain the latter in double-bow form, and thereby greatly stiffen the upper portion of the leg without proportionately increasing its weight, and also permit the sliding end rod to enter and extend through the said hollow brace, all substantially as hereinafter described, and shown in the aforesaid drawing.

In the aforesaid drawing, Figure 1 is a perspective view of a tripod which embodies this invention. Fig. 2 shows, on a larger scale, a longitudinal section of one of the legs of the same tripod secured to one of the ears of an ordinary tripod-head. Figs. 3 and 4 are elevations of a similar leg secured to and between cheeks on a tripod-head of common construction. Fig. 5 is a transverse section, on a larger scale, of the leg at the line *z z* in Figs. 2, 3, and 4; and Fig. 6 is a transverse section, on the same scale, of the leg at the line *y y*. Fig. 7 is a transverse section, on a like scale, at the line *x x* in Fig. 2. Fig. 8 is a view from beneath of a transverse section at line *w w* in Fig. 3; and Fig. 9 is a like view of a transverse section at the line *v v* in Fig. 4.

A A′ are two opposite upper side strips in each leg; and B is a lower end rod, fitted to, and movable endwise between, the lower end parts of the side strips. In each leg are two separate screw-clamps, C C, which surround the lower portion of the two side strips A A′ and the intermediate end rod B, and which are arranged apart from each other, and are preferably fastened to one of the side strips by screws *d d* or other suitable devices. The clamps C C have thumb-screws *e e*, by the use of which the rod B can be easily and quickly clamped and held firmly in any desired extended position by and between the end parts of the side strips, the sides *f f*, Fig. 5, of the clamps serving as guides to the rod between the side

strips. A washer, *g*, is preferably arranged between the end of the screw *e* and the adjacent side strip A′, to lessen the wear of the latter.

The two clamps C C are to be of any suitable width and strength, and either two or more such clamps can be applied to the lower end parts of each pair of the side strips A A′, as shall be preferred in carrying out this invention.

H is a brace, arranged between and secured to the middle portion of each pair of the side strips A A′, so as to hold outward the latter in arched form, and thereby greatly stiffen and strengthen the leg; and at the same time the brace H is of a skeleton form, that permits the rod B to extend through or past the brace, as indicated in the drawing. One, two, or more of the braces H can be arranged and secured between and to each pair of the side strips, as shall be desirable or best in carrying out this invention; and in constructing my improved tripod-legs above described, I commonly prefer to make the side strips A A′ and end rod B of wood having straight grain, running lengthwise thereof, and to make the clamp C, brace H, and head I of brass, bronze, or other suitable metal.

In making my improved tripods, the upper end parts of the side strips A A′ are secured and pivoted to the tripod-head I by means of any suitable devices.

In case the head I has radiating perforated lugs *j*, Figs. 2, 1, and 7, the upper end parts of the side strips of each leg are preferably furnished on their inner sides with circular washer-pieces *k*, firmly fastened thereto and fitted against the sides of the lug, and perforated, and secured to the lug by a pivot-bolt, *l*, as indicated in Figs. 2 and 7; and in that case I commonly prefer to have each piece *k* somewhat concave on its face, to secure a broad circular bearing against the lug, and made of wood, arranged with its grain across the grain of the wood of the side strips A A′, to strengthen the tops of the latter against liability of becoming split.

In case the tripod-head I has perforated cheek-pieces *m m*, as represented in Figs. 3, 4, 8, and 9, the upper end parts of each pair of the side strips A A′ are to have a block, *n*, secured between them, and the whole perforated and fitted between the cheek-pieces, and pivoted thereto by a bolt, *l′*, as indicated in Figs. 3 and 8; or the end parts of each pair of side strips can have a block, *n*, secured between them and a metal cap, *o*, fastened thereon, and the whole perforated and fitted between the cheek-pieces, and pivoted thereto by a bolt, *l′*, as represented in Figs. 4 and 9, wherein one side strip A′ is arranged outside of the other one.

It will thus be seen that my above-described improved adjustable tripod-legs are capable of being substituted and used in the place of the ordinary solid legs now in use in common tripod-heads, having ears or cheeks, to which the legs are pivoted.

It will be observed that it is essential to my present invention that the upper part of the two side strips shall be adapted to be pivoted to a tripod-head, and that two separate screw-clamps, C C, shall surround and be fitted to the lower portion of the two side strips and the intervening sliding end rod, to firmly hold the latter in any desired position between the two side strips, substantially as herein set forth.

What I claim as my invention is—

1. A tripod-leg having two side strips, A A′, adapted to be pivoted to a tripod-head, the intervening sliding end rod B, and the two separate screw-clamps C C, applied to and around the lower portion of the said side strips and intermediate end rod, substantially as shown and described.

2. A tripod-leg having two upper side strips, A A′, of bow form, and adapted to be pivoted to a tripod-head, intermediate sliding end rod B, separate screw-clamps C C, and hollow brace H, all combined, substantially as shown and described.

In testimony whereof I hereunto set my hand in the presence of two subscribing witnesses this 20th day of October, 1877.

WILLIAM GURLEY.

Witnesses:

PAUL COOK,

F. C. A. JONES.