

(No Model.)

2 Sheets—Sheet 1.

J. W. HARMON.

ARTIFICER'S LEVELING INSTRUMENT.

No. 281,267.

Patented July 17, 1883.

Fig. 1.

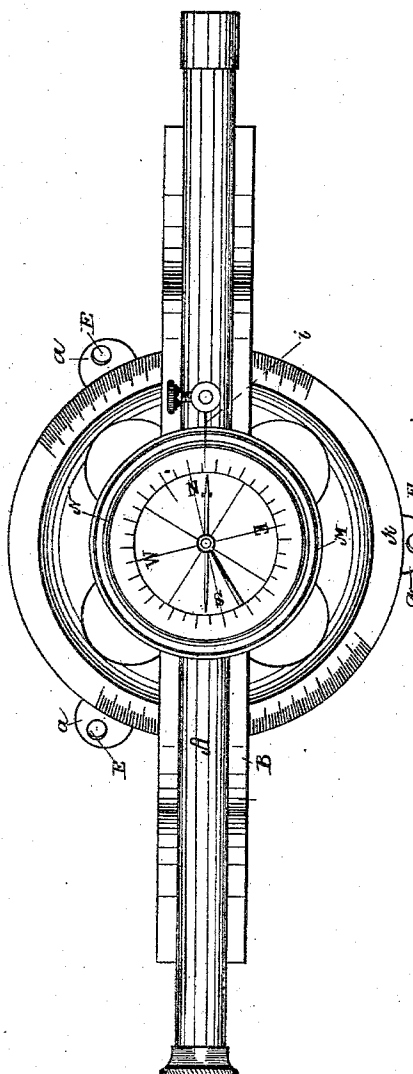


Fig. 2.

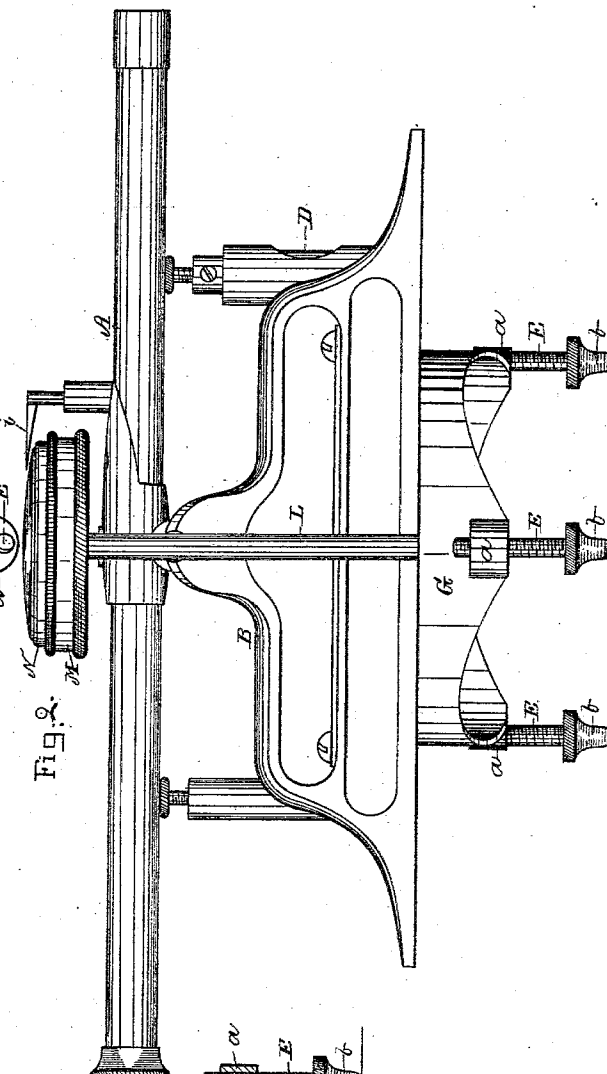
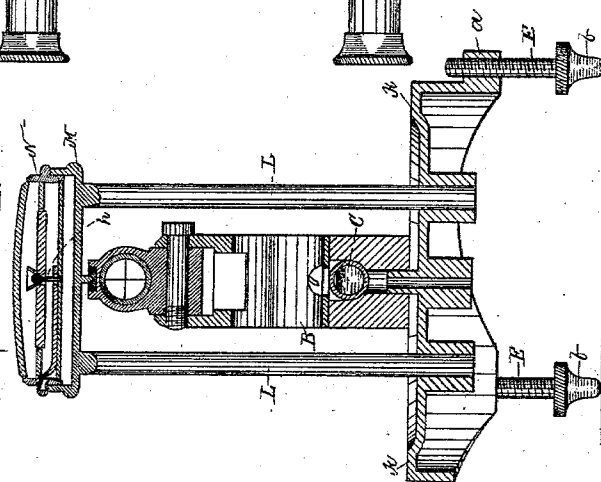


Fig. 3.



Witnesses.

*S. N. Piper*  
*E. A. Pratt*

Inventor.

*John Warren Harmon*

by *R. H. Egan* atty.

(No Model.)

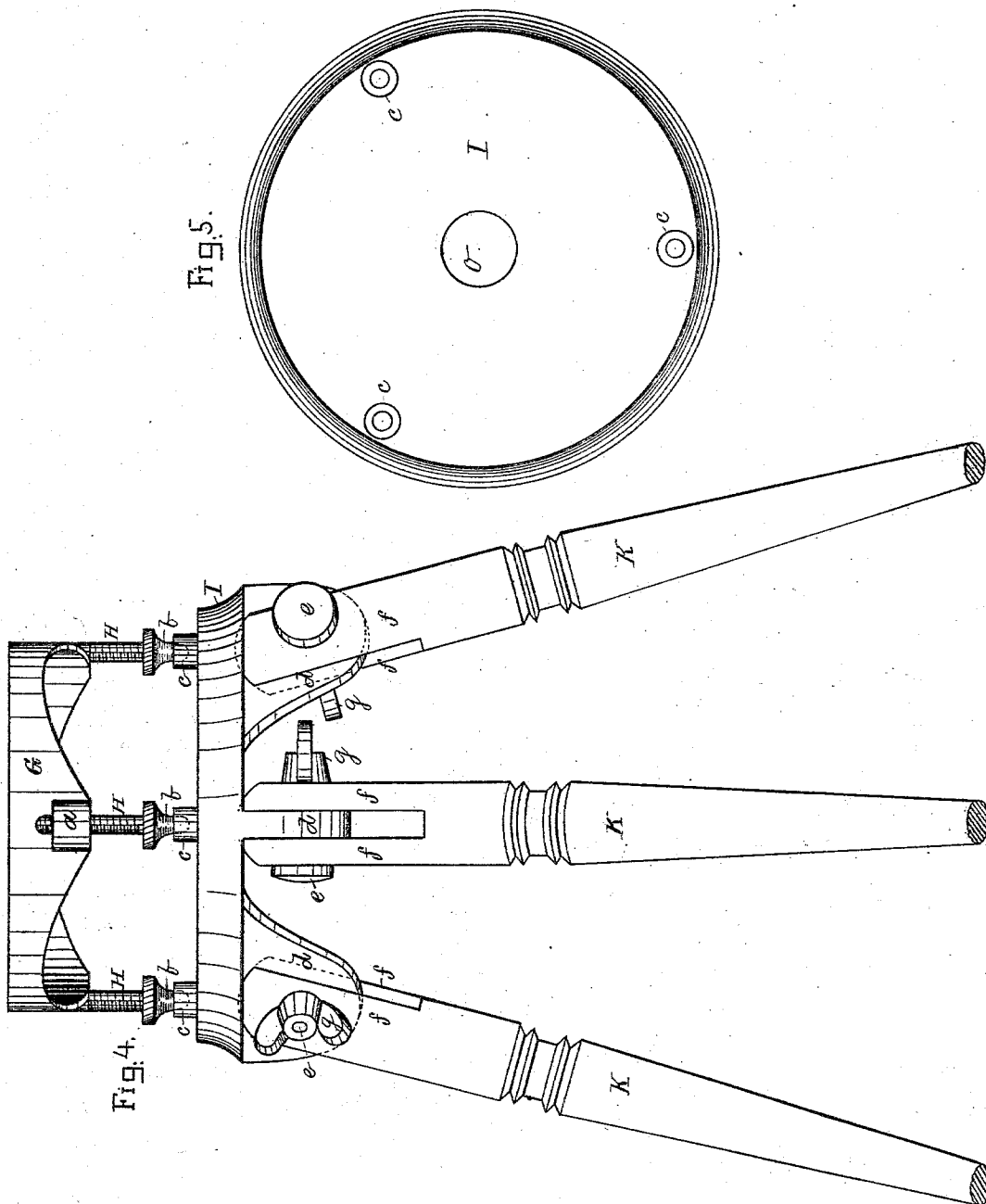
2 Sheets—Sheet 2.

J. W. HARMON.

ARTIFICER'S LEVELING INSTRUMENT.

No. 281,267.

Patented July 17, 1883.



Witnesses.

*S. N. Piper*  
*E. A. Pratt*

Inventor.

*John Warren Harmon*  
by *R. U. Eay* att'y.

# UNITED STATES PATENT OFFICE.

JOHN W. HARMON, OF BOSTON, MASSACHUSETTS.

## ARTIFICER'S LEVELING-INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 281,267, dated July 17, 1883.

Application filed January 29, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN WARREN HARMON, of Boston, in the county of Suffolk, of the Commonwealth of Massachusetts, have invented a new and useful Improvement in Artificers' Leveling-Instruments; and I do hereby declare the same to be described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view, Fig. 2 a front elevation, and Fig. 3 a transverse and median section, of an instrument provided with my invention, the nature of which is defined in the claim hereinafter presented.

This instrument has a telescope, A, and an arched supporting-bar, B, to which such telescope, at its middle, is pivoted, there being in the said bar horizontal and vertical spirit-levels C and D. It also has screws E E for adjusting the axis of the telescope in parallelism with that of the horizontal spirit-level. The bar B, at the center of its lower edge, is pivoted to a divided limb, G, at the center thereof, and such limb is furnished with three adjusting-screws, H, which screw into ears or projections *a*, extending from the limb at equal distances apart. Each of the said screws has a tapering pivot, *b*, to enter and automatically fit closely one of three steps, *c c c*, projecting upward from the head I of a tripod. The head I has three leg-supporting flanges, *d*, extending downward from it, each entering between the two prongs of one of three legs, K, furcated in its upper part, as represented. There is to each leg a screw-bolt, *e*, which goes through its prongs *f f* and the flange *d* between them, and has screwed upon it a nut, *g*. By such means each leg may be clamped to its sustaining-flange with the necessary power to cause the leg to move on the bolt with the necessary friction to keep steady the leg and tripod-head while the instrument may be in use. Furthermore, the divided limb has each of its areal divisional marks arranged not ra-

dially, but so as to line with one side of the bar B when such side is against the said mark. This enables the side of the bar, instead of its axis, to be used with the divisions of the limb, and taking or setting of angles with the instrument. From the divided limb there project upward, on opposite sides of the telescope, two posts, L L, on the upper ends of which there is secured a stationary magnetic compass-supporter, it consisting in a cylindrical box, M, open at top, and having within and to fit it a magnetic compass, N, whose needle is shown at *h*. This compass can be revolved by hand within its supporter; and there is fixed to and extended from the telescope and over the compass, as shown, an index-pointer, *i*, it being adapted so as to be adjustable vertically. By means of the said pointer *i* and the divided limb or ring *k* and needle of the compass, either angles or courses may be determined by the telescope, as will be easily understood by persons acquainted with leveling-instruments, theodolites, or surveying-compasses.

Fig. 4 is a side view of the tripod and the limb G. Fig. 5 is a top view of the head of the tripod. Through the tripod-head, at its center, is a circular opening or hole, *o*, to enable a plumb-line, when attached to the divided limb at its center, to hang freely and vertically, in order to centralize the instrument over and relatively to an object, as occasion may require.

I claim—

The combination of the stationary magnetic compass-supporting box and the magnetic compass provided with the needle and divided limb, as set forth, with the telescope and the index-pointer applied thereto, all being adapted and arranged substantially and to operate as represented.

JOHN WARREN HARMON.

Witnesses:

R. H. EDDY,  
E. B. PRATT.