A. P. FRESHMAN.

Compass.

No. 200,048. **Patented Feb. 5, 1878.**

FIG. 1.

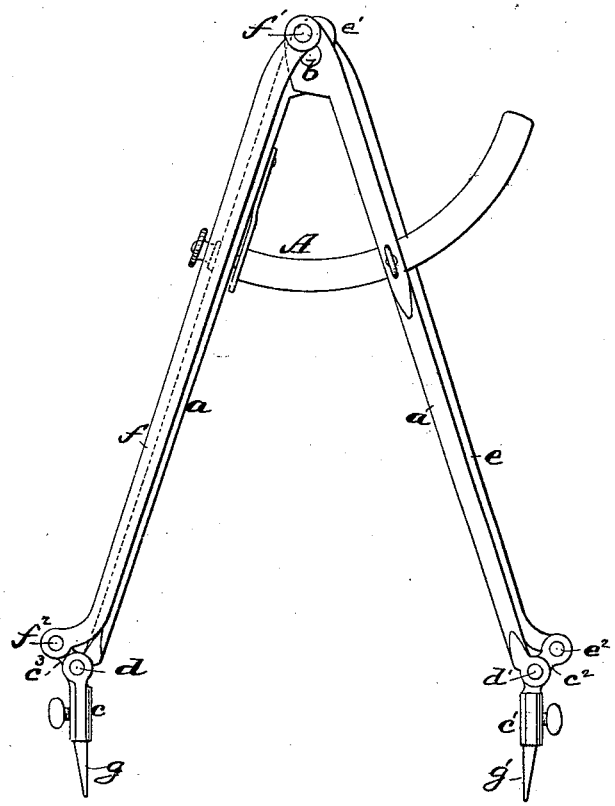


FIG. 2.

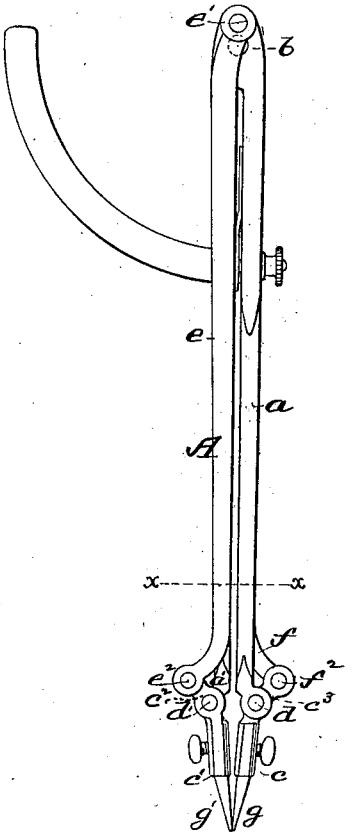


FIG. 3.

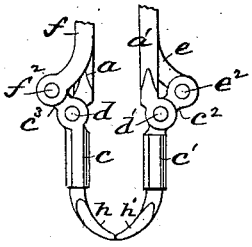
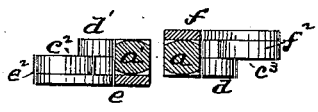


FIG. 4.



ATTEST:

Paul Bakewell

Saml. S. Boyd

INVENTOR:

Andrew P. Freshman,

by Chas. D. Moody,

atty.

UNITED STATES PATENT OFFICE.

ANDREW P. FRESHMAN, OF BELLEVILLE, ILLINOIS, ASSIGNOR OF ONE-HALF HIS RIGHT TO GEORGE EISENBERG, OF SAME PLACE.

IMPROVEMENT IN COMPASSES.

Specification forming part of Letters Patent No. **200,048**, dated February 5, 1878; application filed November 26, 1877.

To all whom it may concern:

Be it known that I, ANDREW P. FRESHMAN, of Belleville, Illinois, have made a new and useful Improvement in Compasses, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a side elevation of a compass containing the improvement, the legs being opened apart; Fig. 2, an elevation, showing the compass closed; Fig. 3, a detail, showing the compass having caliper-points; and Fig. 4, a cross-section taken on the line x x of Fig. 2.

Similar letters refer to similar parts.

By means of the present invention the parallelism of the points of the compass-legs is preserved whatever the angle the legs are opened out to.

The improvement also relates to the provision by which the points of the legs can be readily replaced or changed.

Referring to the drawings, A represents a compass having my improvement. The legs a a' are pivoted to each other at b in the usual manner; but they are each (and similarly) made in two sections, a and c and a' and c^1, jointed, respectively, at d and d'. The legs, at their upper ends, are similarly extended a short distance beyond the pivot b. A lever or rod, e, is pivoted at one end, e^1, to the extension of the leg a, and at the other end, e^2, to an extension, c^2, of the section c^1. A similar rod, f, is similarly pivoted at f^1 to the leg a', and at f^2 to an extension, c^3, of the section c. The extensions c^2 and c^3 are, respectively, on the outer sides of the legs a' and a.

The various parts being thus arranged, extended, and connected, as the legs a a' are opened apart or closed together the rod e causes the sections c^1 and a' to turn upon each other, and the rod f causes the sections c and a to turn upon each other, and the effect of the combined movements is to cause the sections c and c^1 to remain parallel with each other in all positions of the sections a and a', for all the parts of the compass are so arranged relatively to each other, and so proportioned, that the sections c and c^1 are parallel when the compass is closed, and that, as the compass is opened, the movements of the sections c and c^1, respectively, upon the sections a and a' are just sufficient to keep the sections c and c^1 parallel. The relations, respectively, of the pivots e^1 and f^1 to the pivot b affect, of course, the relations of the pivots f^2 and e^2 to the pivots d and d'. As the one is changed the other must be correspondingly modified.

The lower ends of the sections c and c^1 may, if desired, be sharpened to constitute the points of the compass-legs. I preferably, however, make the extreme ends g g' of the sections detachable. This enables a point to be renewed with but slight expense. It also enables differently-shaped points to be used. In Fig. 3, points h h', shaped suitably for calipers, are shown.

That portion of the improvement first above described is especially useful in connection with such points, for, in making nice measurements with calipers, it is desirable for the extreme points to be applied as nearly as is practicable in the line of the diameter being measured. The keeping of the sections c and c^1 parallel enables the points to be thus presented.

This improvement is valuable not only in compasses, but also in drafting-instruments, and other tools that consist mainly of two parts or legs pivoted together at one end, and that are used in measuring.

I am aware that dividers having what is termed a "parallelogram" connected with a stanchion depending from the head of the dividers have heretofore been constructed.

I claim—

The herein-described compass, consisting of the sections a a' and c c^1 and the rods e and f, the rods being connected at their lower ends with the sections c^1 c and at their upper ends directly with the sections a a', and combined and operated substantially as described.

ANDREW P. FRESHMAN.

Witnesses:

PHILIP THEBERS,

FRANK SCHOPP.