

(No Model.)

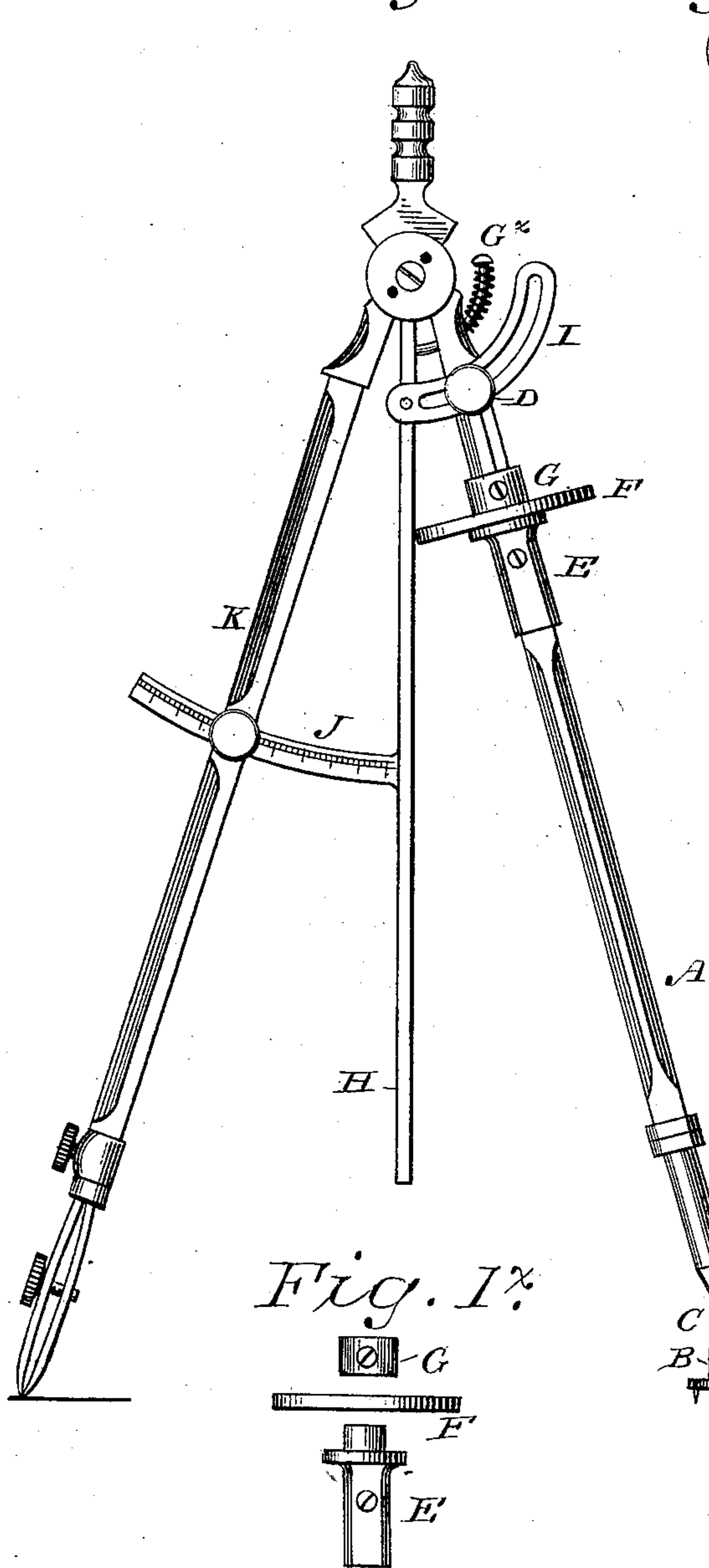
J. F. BENNETT & B. B. SMITH.

DRAFTSMAN'S COMPASSES.

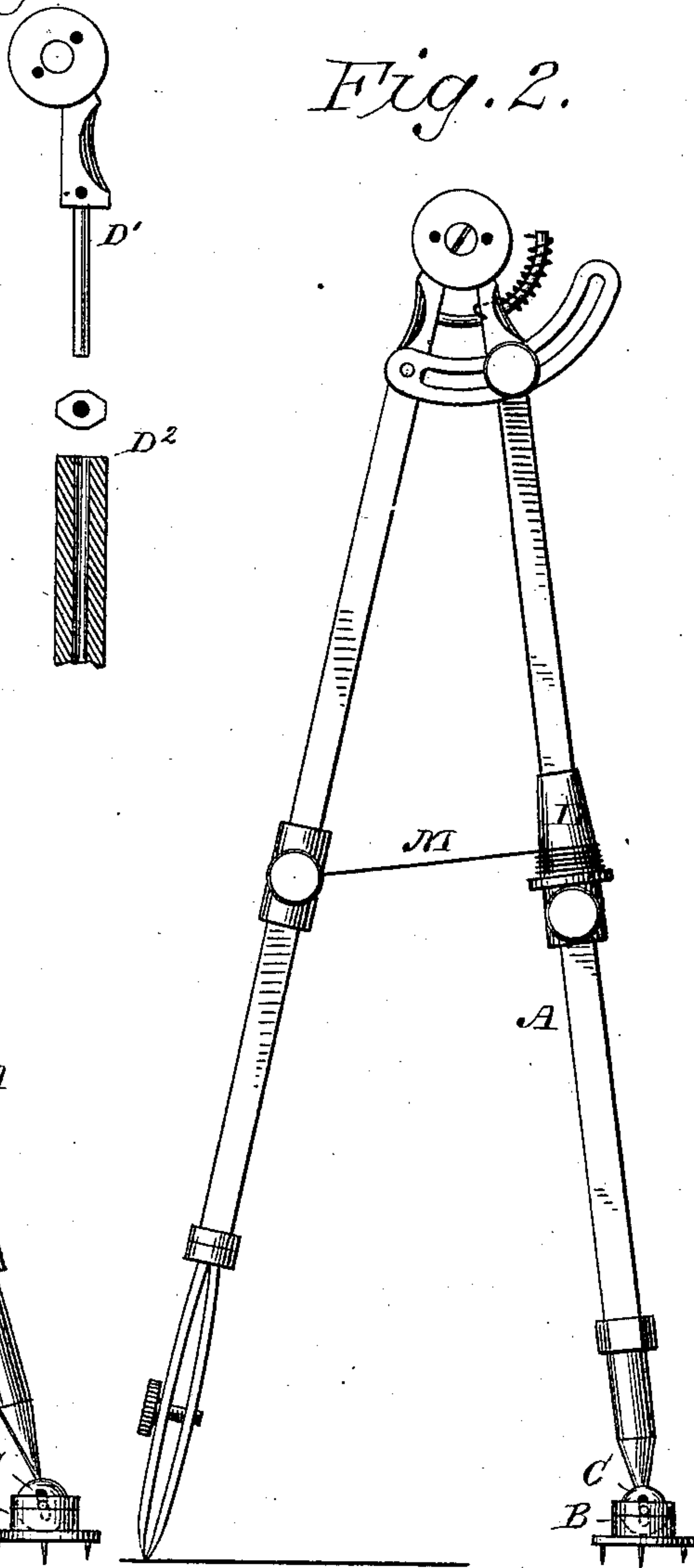
No. 349,203.

Patented Sept. 14, 1886.

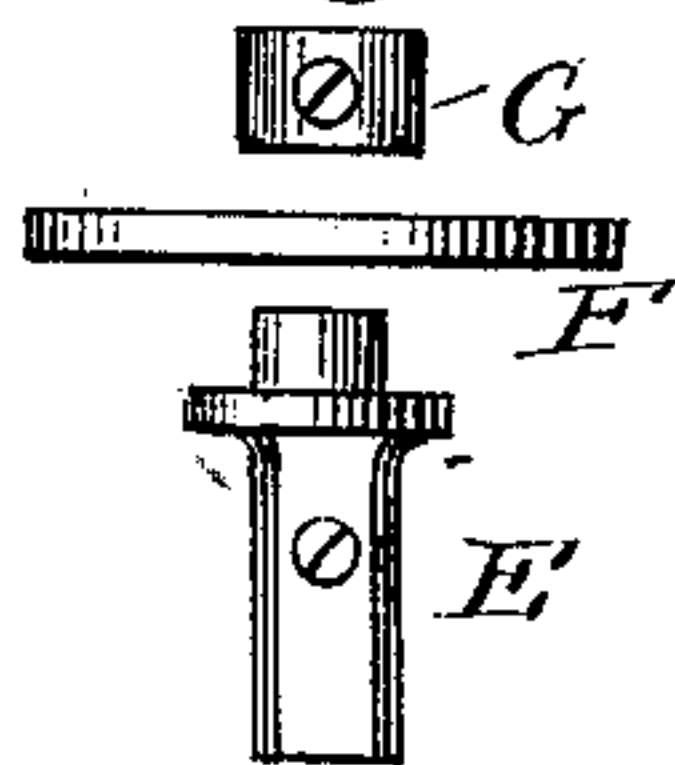
*Fig. 1. Fig. 1<sup>2</sup>.*



*Fig. 2.*



*Fig. 1<sup>3</sup>.*



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## DRAFTSMAN'S COMPASSES.

SPECIFICATION forming part of Letters Patent No. 349,203, dated September 14, 1886.

Application filed May 11, 1885. Serial No. 165,146. (No model.)

*To all whom it may concern:*

Be it known that we, JAMES FREDERICK BENNETT and BENJAMIN BATTY SMITH, citizens of Great Britain, residing at Sheffield, in the county of York, have invented certain new and useful Improvements in Mathematical Compasses; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

Our invention relates to improvements in the construction of mathematical compasses, the object of the invention being to construct an instrument (or instruments) by means of which a great variety of figures may be drawn or set out, such as circles, spirals, ellipses, and other regular or irregular forms; and we accomplish our object by constructing the said instrument with a non-rotating foot and leg connected by a peculiar ball-and-socket joint, which prevents rotation of said leg, and at the same time facilitates pressing the pencil or pen upon the paper, and combining therewith other mechanical parts, as hereinafter set forth.

The accompanying drawings illustrate our invention.

Figure 1 represents an instrument or compasses which can be used for describing circles, ellipses, and other regular and irregular figures. Fig. 2 represents an instrument or compasses which will describe circles and spirals or volutes. Figs. 1<sup>x</sup> and 1<sup>z</sup> are detail views of parts of the instrument shown in Fig. 1.

Similar letters refer to similar parts in the several figures.

In constructing the instrument illustrated in Fig. 1, we make the non-rotating leg A with a movable foot, B, which are connected by means of a ball-joint, C, which has not the usual universal movement of such joints, rotation around the axis of the leg A being prevented by pins passed through the sides of the foot B and into a groove formed on the periphery of the ball. (Represented in the drawings by a black line.) The non-rotating leg is attached to the other portion of the instrument by a socket and pin at D, Fig. 1, (shown in detail at D' and D<sup>2</sup>, Fig. 1<sup>z</sup>.)

On the leg A is fitted an adjustable slide, E, upon which a templet, F, of any desired

shape, may be secured by means of the collar G. These parts are shown in detail.

Between the legs of the instrument we fix a guide-bar, H, to which is attached a quadrant, I, a similar quadrant, J, being placed lower down the guide-bar H, and passed through the leg K, to which it may be secured by suitable means—such as a screw. This guide-bar H is held against the perimeter of the templet F by the action of a spring, such as shown at G<sup>x</sup>, (or a coiled spring may be inclosed in the joint.) Thus when the leg is turned round to describe the figure it reproduces an enlarged fac-simile of the shape of the templet of any desired size within the capacity of the instrument, and by adjusting the positions of templet and quadrants variations of the figure may be obtained. The foot B is provided with two or more points to prevent rotation, the center one being preferably made the longest. The instrument shown in Fig. 2 has a similar non-rotating leg, A, and foot B. A spring in this case is required to force the legs apart. Upon the non-rotating leg we fix a cone, L, to which is attached one end of a cord or chain, M, the other end being secured to the rotating leg. When the instrument is rotated, the cord or chain will be wound up on the cone, drawing the pen or pencil gradually nearer to the center and describing a spiral figure.

We are aware that a non-rotating foot and leg, the latter provided with a templet, are not broadly new in compasses, and we hereby disclaim the same, broadly considered.

We are also aware that a ball-and-socket joint, broadly considered, has before been used to connect a non-rotary foot with a rotary leg in compasses for describing circles.

We claim as new and desire to secure by Letters Patent—

1. In mathematical compasses for describing curvilinear geometrical figures other than circles, a non-rotating foot and leg connected by a ball-and-socket joint provided with pin and groove, substantially as herein described, for the purpose set forth.

2. In mathematical compasses, the combination of a non-rotating foot and leg connected by a ball-and-socket joint, provided with pin and groove, a templet carried by said leg, and

a revolving pen or pencil leg controlled as to its path by such templet, substantially as herein specified.

3. The within-described compasses for describing ellipses and like figures, comprising a non-rotating foot and leg, a templet carried by the latter, a guide-bar held in contact with the perimeter of said templet by a spring, and a revolving leg adjustably connected with said guide-bar, substantially as herein shown and described, for the purpose set forth.

In testimony that we claim the foregoing as our own we have affixed hereto our signatures in presence of two witnesses.

JAS. FREDK. BENNETT.  
BENJ. B. SMITH.

Witnesses:

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