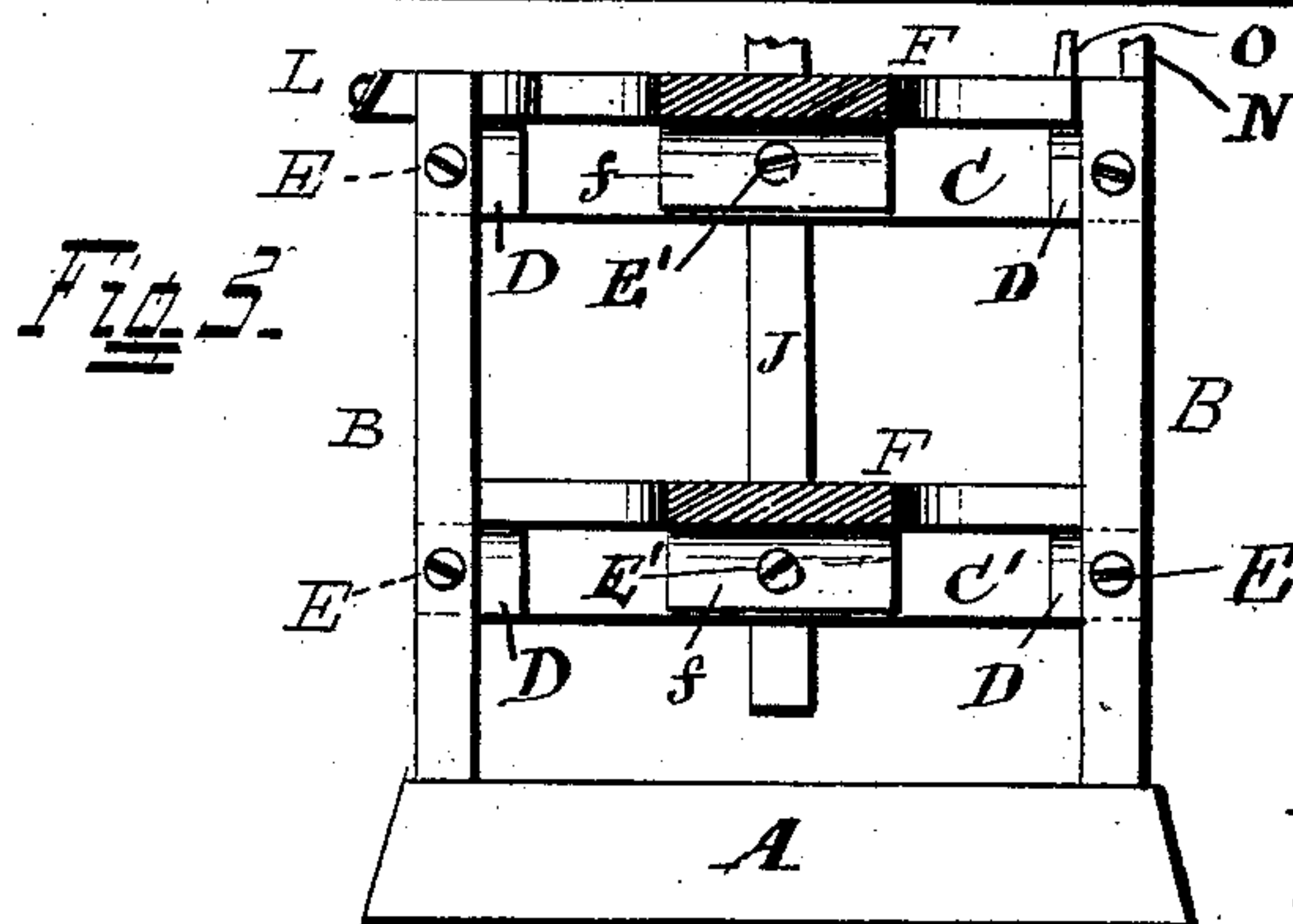
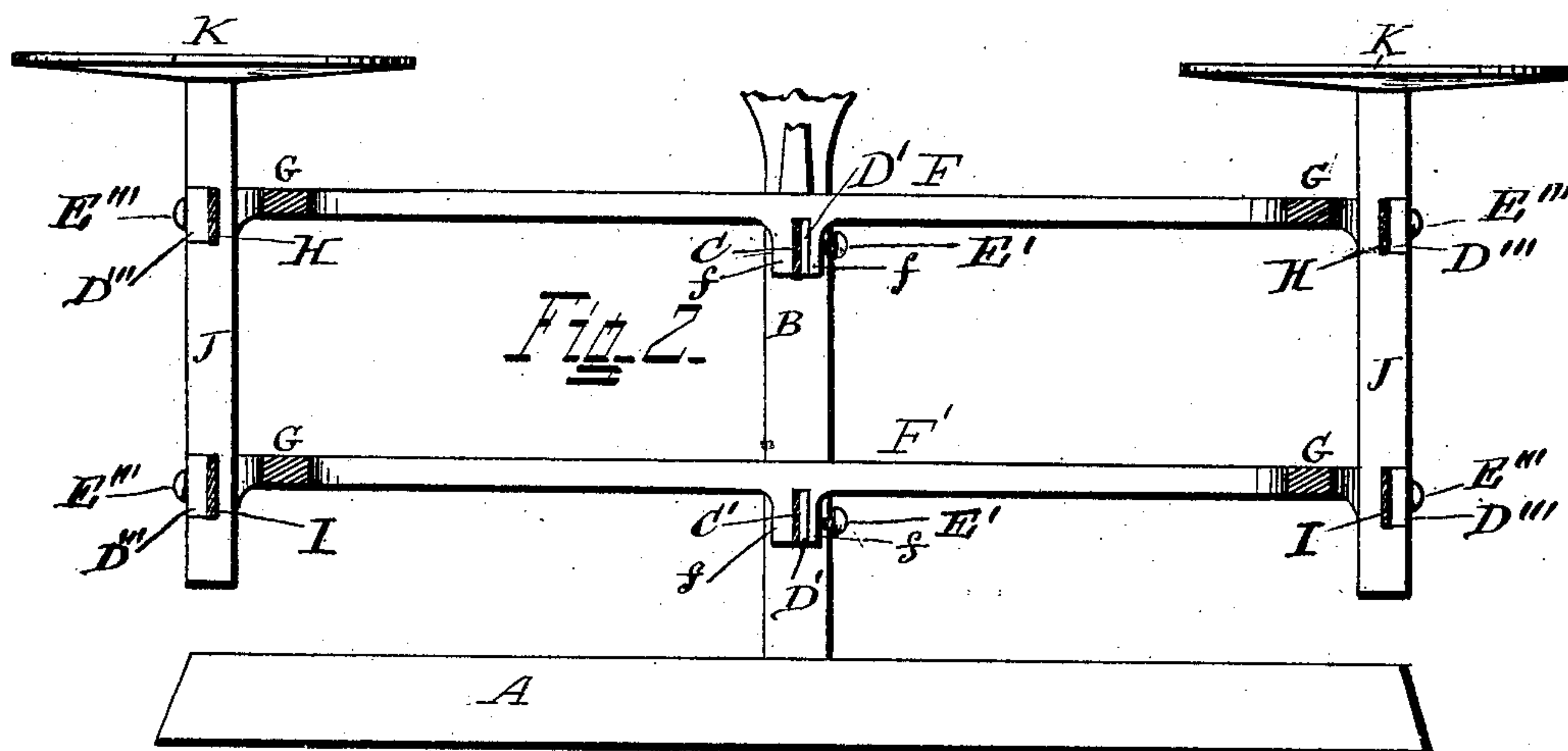
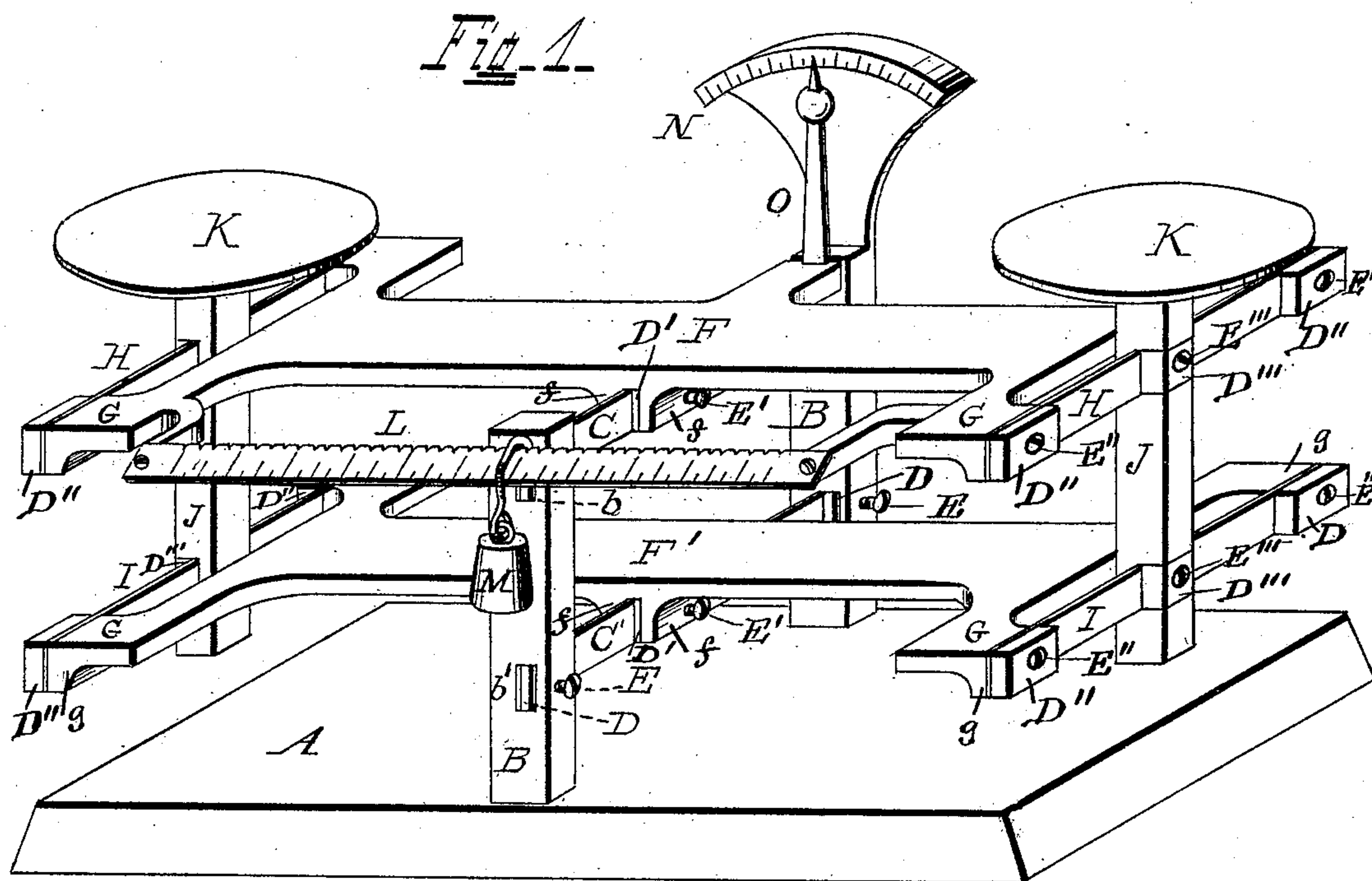


(No Model.)

N. DU BRUL.
WEIGHING SCALE.

No. 299,757.

Patented June 3, 1884.



Attest
Carl Spengel
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UNITED STATES PATENT OFFICE.

NAPOLEON DU BRUL, OF CINCINNATI, OHIO.

WEIGHING-SCALE.

SPECIFICATION forming part of Letters Patent No. 299,757, dated June 3, 1884.

Application filed January 25, 1884. (No model.)

To all whom it may concern:

Be it known that I, NAPOLEON DU BRUL, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Weighing-Scales, of which the following is a specification.

My invention relates to improvements in those balances or weighing-scales in which the torsional elasticity of metal or analogous material is employed to control the oscillations of the beam.

A distinguishing feature of my invention consists in the employment of flat strips, bars, or rods of steel or like elastic material, which, while being stretched lengthwise, have their ends so fastened as to hold such strips, bars, or rods by their ends only in a horizontal position transverse of the beam and edge up. The oscillating member or beam, being fastened mid-length of and supported by such strip, bar, or rod, receives the stress of weight placed upon pans or other supports attached to similar strips, bars, or rods stretched and secured in such beam or oscillating support. Associated with the above is a supplementary beam, similarly fastened to a lower central strip, bar, or rod, and two other and similar strips, bars, or rods, which are in like manner fastened to the other ends of the beams and to one or more vertical stems, upon whose upper extremities rest the pans, platforms, or other receptacles for the articles to be weighed, or for the weights themselves. The construction is such as to reduce friction to a minimum and to preserve the horizontality of the pans or platforms in every position.

My scale is simple in design, of few parts, not costly in production, very durable, owing to substantial construction, is of great sensitivity, and not liable to get out of order. The stem or stems which support the pans are prolonged downward, so as to impinge against the base at any desired point of oscillation, in order to prevent undue strain of the torsion strips, bars, or rods from the weight that may be put on the pans. The beams extend in both directions, with two pan-supports—one on each side—and as many pairs of torsion strips, bars, or rods, in addition to the pair of supporting strips, bars, or rods at the fulcrum-posts. The main object of the supplementary beam with the end torsion strips, bars, or rods

is to have that additional torsion strip, bar, or rod to fasten and receive the vertical pan-supports, and thereby distribute the strain of the weight put in the pans on several torsion strips, bars, or rods. Furthermore, the supplementary beam, with its end torsion strips, bars, or rods fastened to the pan-supports, keeps the pan-supports in a perfectly vertical position when oscillating, and consequently maintains horizontality of the pans, which is of great importance in a weighing-scale.

In the accompanying drawings, Figure 1 is a perspective view of a weighing-scale embodying my invention. Fig. 2 is a vertical longitudinal section thereof. Fig. 3 is a vertical transverse section of the same.

A is a base or foot, upon which are two posts, B. Each post has a lower slot, *b'*, and an upper slot, *b*. The opposite slots receive the ends of the stretched strips, bars, or rods *CC'*, of steel or equivalent elastic material, set on edge. These strips are firmly clamped in their respective slots by gibs D and screws E. The posts B are the fulcrum-posts, and the strips, bars, or rods *CC'* the fulcrum-strips.

F is a beam having projections *f*, forming legs to straddle the middle portion of the strip, bar, or rod C.

D' is a gib, and E' a screw by which the beam is secured to the strip, bar, or rod, the screw working through one of the projections and bearing upon the gib and strip, bar, or rod between the projections.

F' is a supplementary beam, like the main beam, having projections *f*, gib D', and screw E', by which it is secured to the strip, bar, or rod C' at the mid-length thereof. Each beam terminates at one or both ends in a T-head or cross-bar, G, to whose extremities *g* are fastened the ends of strips, bars, or rods H I, of similar form to the strips, bars, or rods *CC'*, by means of blocks D'' and screws E''.

To the strips H I are fastened rigidly at their mid-length, by blocks D''' and screws E''', the stems J of pans or plates K.

The upper beam may have attached to it one or more scales or graduated bars, L, for one or more sliding weights, M.

Attached to one of the posts may be a graduated segment, N, to mark the positions of a pointer, O, projecting upward from the beam F. The stems J, being prolonged downward,

as shown, may, by contact with the base, limit the oscillations of the beams within a range that will not impair or strain the torsion strips, bars, or rods by any excessive weight put in the scales.

The form of scale herein shown is susceptible, without departure from the characteristic features of the invention, of various modifications, as shown and described in my applications numbered 118,692, 118,693, 118,694, 118,695, and 118,979.

Knife-edge supports may be substituted for one or more of the torsion strips, bars, or rods. Such supports may be located at the central fulcrums of the beam.

The end torsion strips, bars, or rods may have their extremities fastened to two vertical pan-supports, while the oscillating beams may be fastened to the mid-length of the torsion strips, bars, or rods.

The central fulcrum strips, bars, or rods may have their ends fastened to the beam, and be supported by a single post at mid-length of the strips, bars, or rods to which it would be fastened.

The torsion strips, bars, or rods may have the represented or any other transverse section—such as square, round, fluted, or triangular.

I claim as new and of my invention—

1. A weighing-scale constructed with flat torsion strip or strips stretched horizontally and set up edgewise, substantially as and for the purpose specified.

2. In a weighing-scale, the combination of a beam, a torsional rod horizontally secured to the end of the beam, and a vertical pan-support rigidly and directly connected to the torsional rod, substantially as and for the purpose set forth.

3. In a weighing-scale, the combination of horizontal beams centrally pivoted to torsion-rods, torsion-rods secured rigidly and directly to the ends of the beams, and pan-support connected rigidly and directly to the torsion-strips on the ends of the beams, as set forth.

4. In a weighing-scale, the combination of beams centrally pivoted, horizontal torsion-rods secured at the ends of the said beams, and pan-supports rigidly and directly connected to the end torsion-rods, and projecting downwardly below the lowest torsion-rods, to form stops, as set forth.

5. In a weighing-scale, the combination of a beam centrally pivoted and having extended arms at the end, a torsion-rod secured directly and rigidly to said arms, and a pan-support secured directly and rigidly to the end torsion-rod, as set forth.

In testimony of which invention I hereunto set my hand.

NAPOLEON DU BRUL.

Attest:

GEO. H. KNIGHT,
SAML. S. CARPENTER.