

(No Model.)

C. A. MILLER.  
LETTER SCALE.

No. 504,534.

Patented Sept. 5, 1893.

Fig. 1

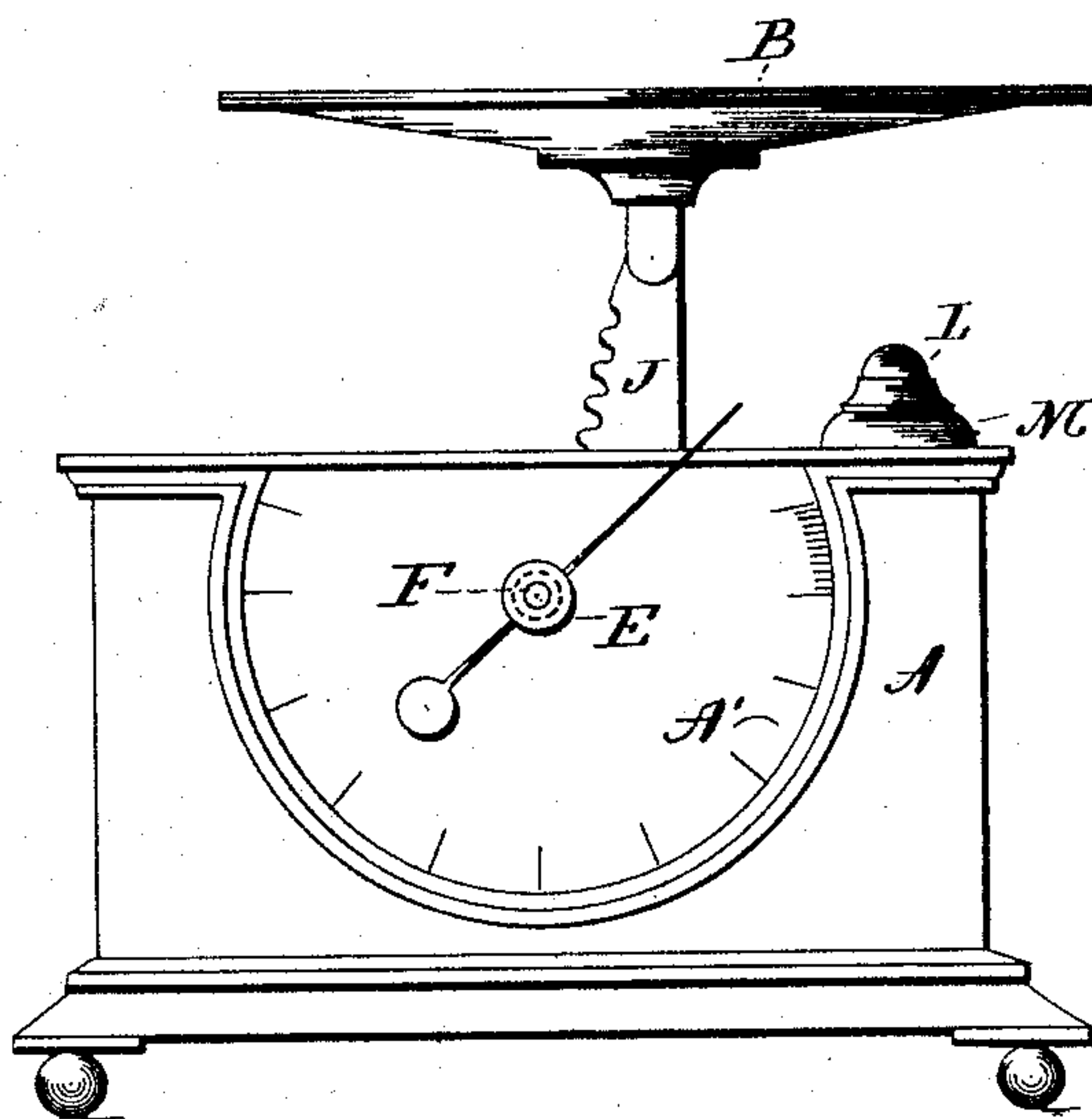


Fig. 3

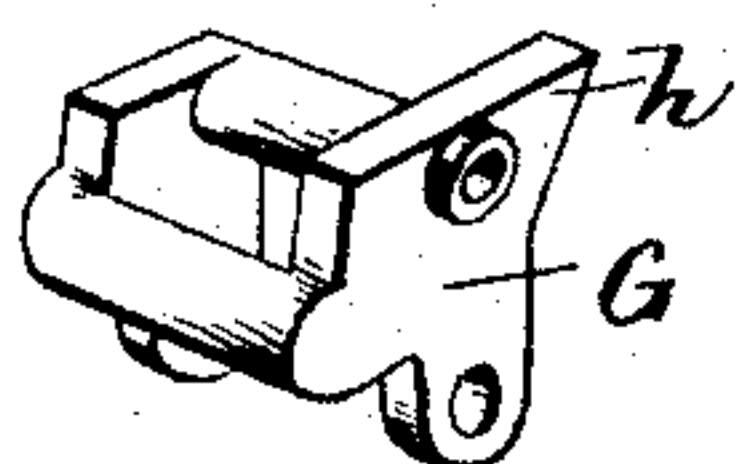


Fig. 2

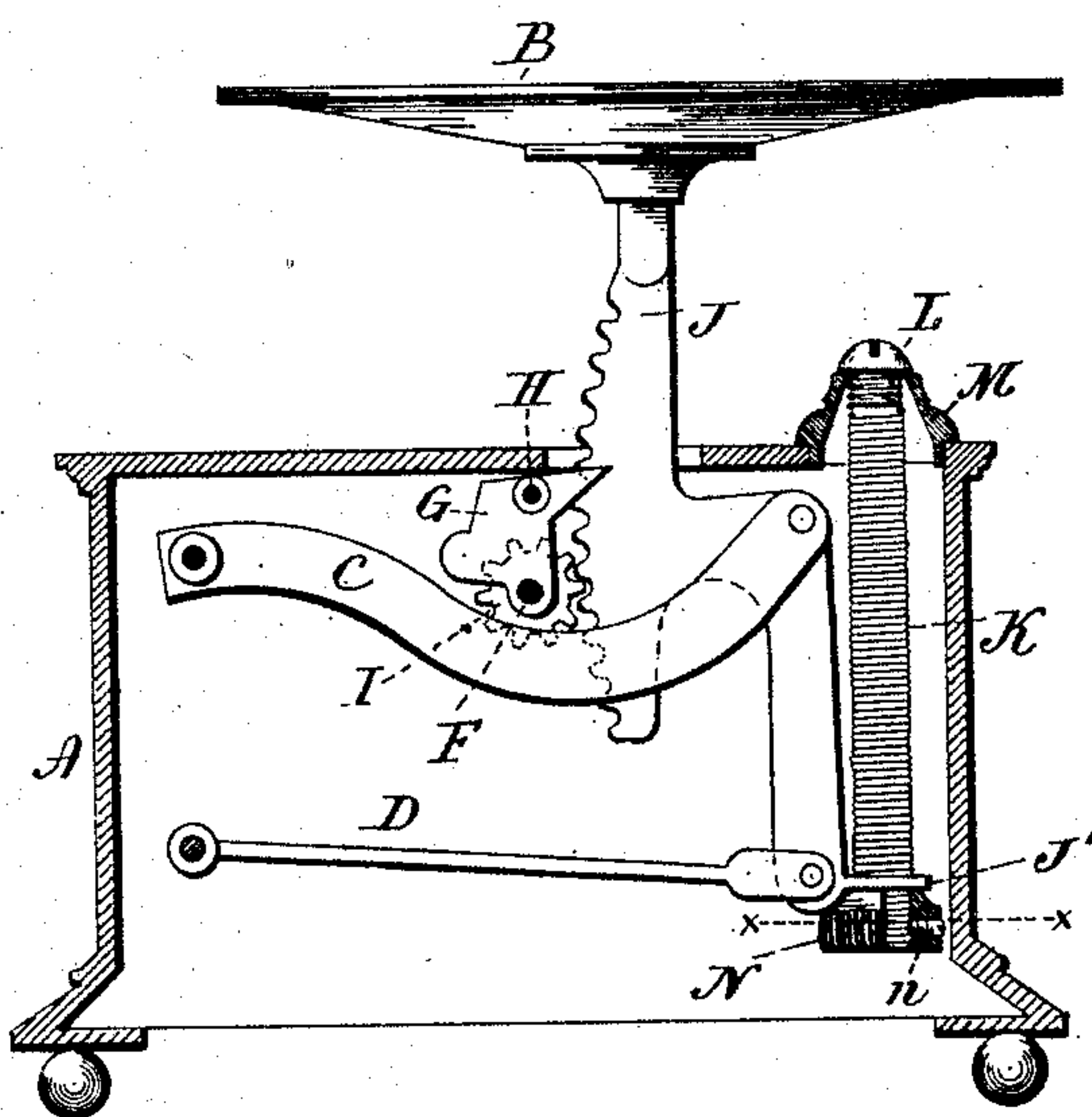
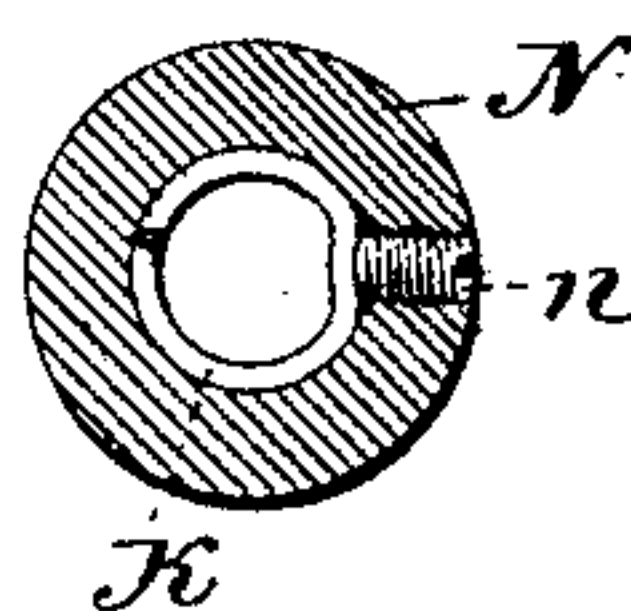


Fig. 4



Witnesses.  
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# UNITED STATES PATENT OFFICE.

CHARLES A. MILLER, OF MERIDEN, CONNECTICUT, ASSIGNOR TO THE  
WILCOX SILVER PLATE COMPANY, OF SAME PLACE.

## LETTER-SCALE.

SPECIFICATION forming part of Letters Patent No. 504,534, dated September 5, 1893.

Application filed February 27, 1893. Serial No. 463,806. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES A. MILLER, of Meriden, in the county of New Haven and State of Connecticut, have invented a new  
5 Improvement in Letter-Scales; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same,  
10 and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in front elevation of a letter-scale constructed in accordance with my invention; Fig. 2, a view in vertical longitudinal section through the case with the pan in elevation; Fig. 3, a detached perspective view of the yoke; Fig. 4, an enlarged view in horizontal section on the line  $x-x$  of Fig. 2, showing the distortion of the coils of the  
15 weighing spring by the set-screw to bind the adjusting nut on the spring against rotation.

My invention relates to an improvement in letter scales, the object being to produce a simple and compact device, of accurate performance, not liable to derangement, and adapted to be very conveniently adjusted to keep it in truth.

With these ends in view, my invention consists in a letter-scale having certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

The case A, pan B, and levers C and D suspended within the case, are of ordinary construction, and do not need detailed description, the front side of the case being provided in the usual manner, with graduations A', over which an indicator E, is swept. The said indicator is mounted upon the projecting  
20 outer end of a shaft F, which is journaled in the lower end of a yoke G, suspended within the case near the top thereof, by a horizontal harbor H.

A pinion I, mounted on the shaft F, between  
45 the two arms of the yoke, takes into a rack J, having corresponding teeth arranged in the segment of a circle, the said rack supporting the pan B, at its upper end, and connected at its lower end, in the usual manner, with the levers C D before mentioned. The  
50 said yoke is provided at its upper end with a

stop-finger  $h$ , extending toward the rack and arranged to engage with the top of the case to prevent the leaves of the pinion I, from bottoming in the teeth of the rack J, as shown  
55 by Fig. 2 of the drawings. The yoke is further constructed and hung so that it will have a very little swinging movement on the arbor H, in order to permit the pinion to move toward and away from the rack, as required by  
60 the bowed arrangement of its teeth. This swinging movement of the yoke is permitted by slightly enlarging the orifice in the case through which the shaft F passes, as shown by dotted lines in Fig. 1.

The pan, rack and levers are normally supported by a spiral weighing spring K, vertically suspended by its upper end from the top of the case, and having its lower end connected with the lower end of the rack, which is  
65 thereto furnished with a horizontally arranged eye J', having an opening of sufficient diameter to permit the spring to pass through it.

A set-screw L, having its threads adapted to take into the coils of the spring, is entered  
75 into the upper end thereof, and provides for suspending it. As herein shown, the head of the said screw is engaged with the upper edge of an upwardly projecting small collar M, mounted in the top of the case, at a point  
80 therein under the pan. This collar, together with the screw L, forms a stop to limit the downward movement of the pan, and hence the extensions of the weighing spring K; it also permits a longer weighing spring to be  
85 used than could be employed without it, for the spring passes up through the top of the case into the top of the collar. The lower end of the spring is furnished with a knurled adjusting-nut N, the threads of which are  
90 adapted to engage the outer sides of its coils which are distorted a little for binding the nut upon the spring, by means of a set-screw  $n$ . The eye J', before mentioned, rests upon the upper edge of this adjusting-nut, as shown  
95 by Fig. 2 of the drawings. The leaves of the pinion I, and the teeth of the rack J, are sufficiently deep so that any sudden movement of the rack resulting from an object being thrown suddenly upon the pan, or from other  
100 causes, will not cause the said teeth and leaves to jump out of engagement, and so permit the



indicator to be displaced with reference to the scale. At the same time, the teeth and leaves mesh into each other with sufficient play to insure the perfectly free working of the rack.

5 The adjusting-nut located at the lower end of the weighing spring, provides very convenient means for keeping the device in condition for accurate work, while the stop located upon the top of the case prevents the  
10 weighing spring from being unduly extended or strained.

I would have it understood that I do not limit myself to the exact construction herein shown and described, but hold myself at liberty to make such changes and alterations as  
15 fairly fall within the spirit and scope of my invention.

I am aware that it is old to hang a head on the lower end of a spring to furnish a support  
20 for the rack of a weighing scale, and also that it is old to insert one end of the spring of a weighing scale within screw-threads that engage the spring, and I do not therefore claim these constructions broadly.

25 Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a letter scale, the combination with the case thereof, of a rack suspended therein and  
30 furnished at its upper end with a pan, a yoke suspended in the said case near the top thereof, and having its upper end adapted to take a bearing against the same, whereby its swinging movement toward the rack is limited, a  
35 shaft journaled in the said yoke, and a pinion and an indicator attached to the said shaft, the former taking into the said rack and the latter standing in front of a scale on the case, substantially as set forth.

2. In a letter-scale, the combination with the case thereof, of a rack, and a spiral weighing  
40 spring suspended by its upper end in the case, and connected at its lower end with the rack, and furnished with an adjusting-nut, having  
45 a threaded central opening adapting it to fit over the spring and to engage with the outer sides of the coils thereof, the rack being supported upon the said nut, which is free to be  
50 moved up and down upon the spring, substantially as described. 50

3. In a letter-scale, the combination with the case thereof, of a rack, a spiral weighing spring suspended at its upper end in the case, connected at its lower end with the rack, and furnished thereat with an adjusting nut, upon  
55 which the rack is supported and the threads whereof take into its coils and a set-screw mounted in the said nut to impinge against the coils of the spring, which are sprung or  
60 distorted to bind the nut thereon against rotation, substantially as described. 60

4. In a letter-scale, the combination with the case thereof, of a rack suspended therein, a pan mounted upon the upper end of the rack, a spiral weighing spring having the said rack  
65 connected with its lower end, a stop in the top of the case, and consisting of an upwardly projecting collar, fixed to the case and having the said spring suspended, from its upper end substantially as described. 70

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHARLES A. MILLER.

Witnesses:

FRED. M. MILLER,  
J. BISHOP.