

No. 694,647.

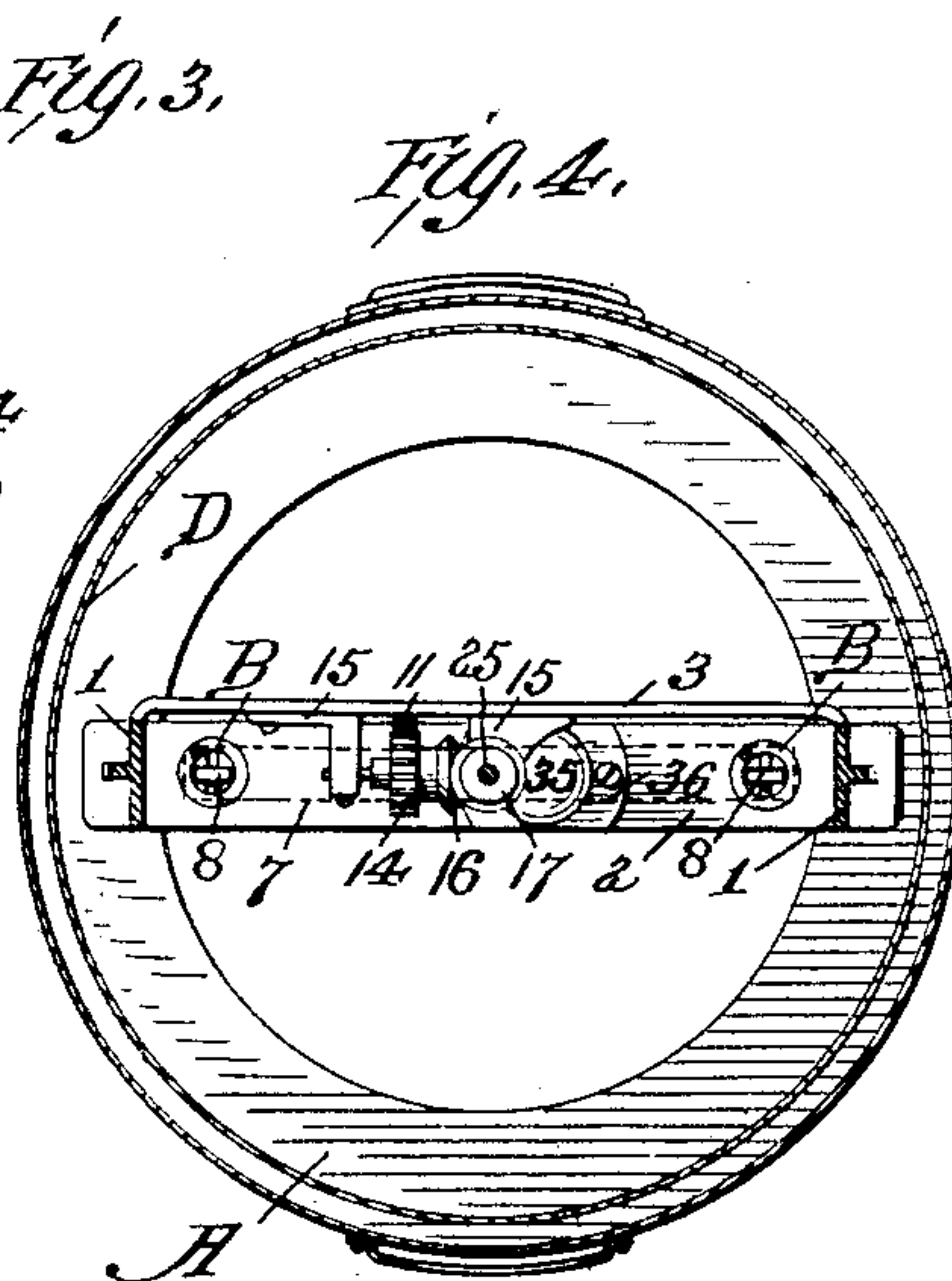
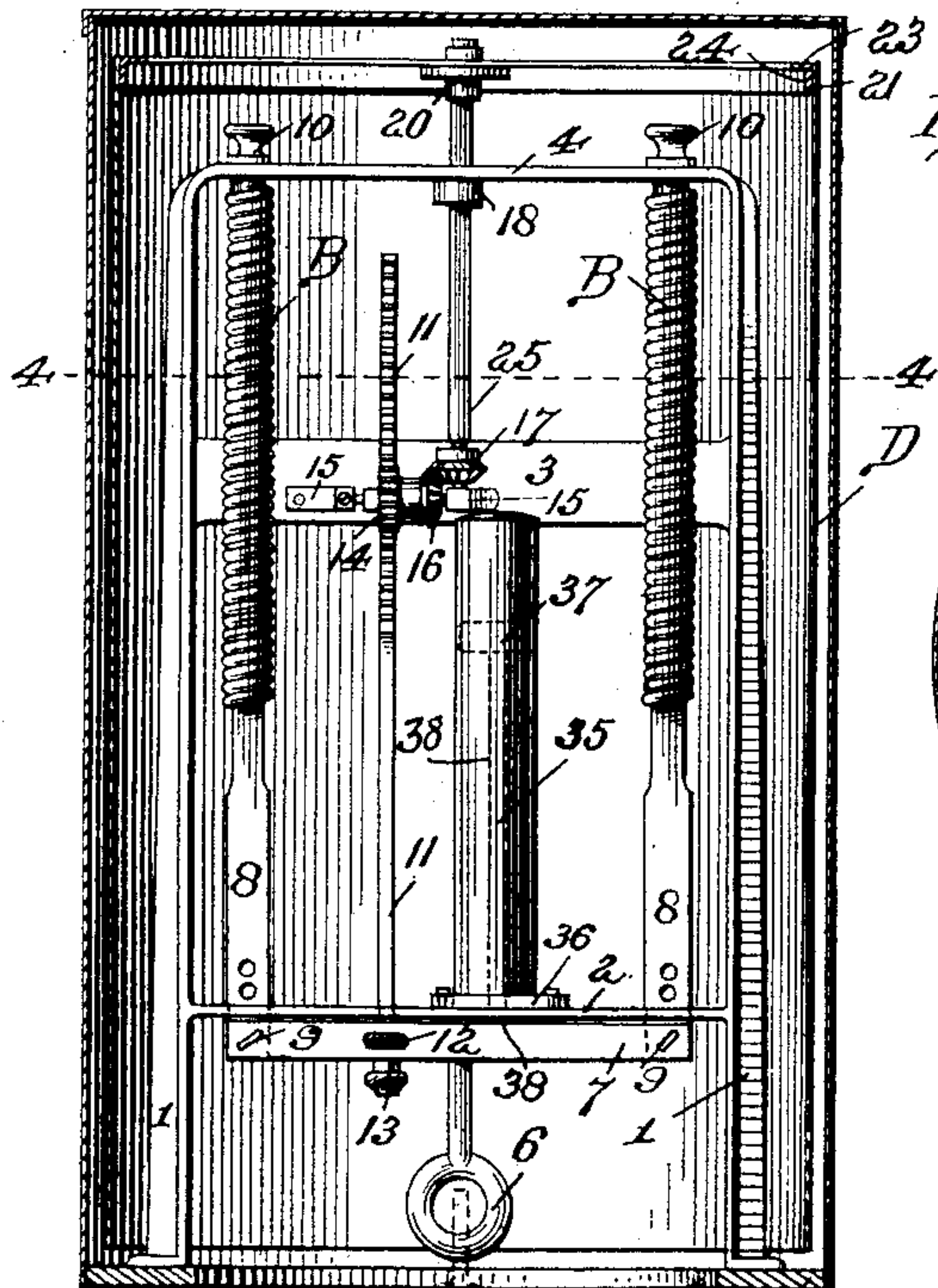
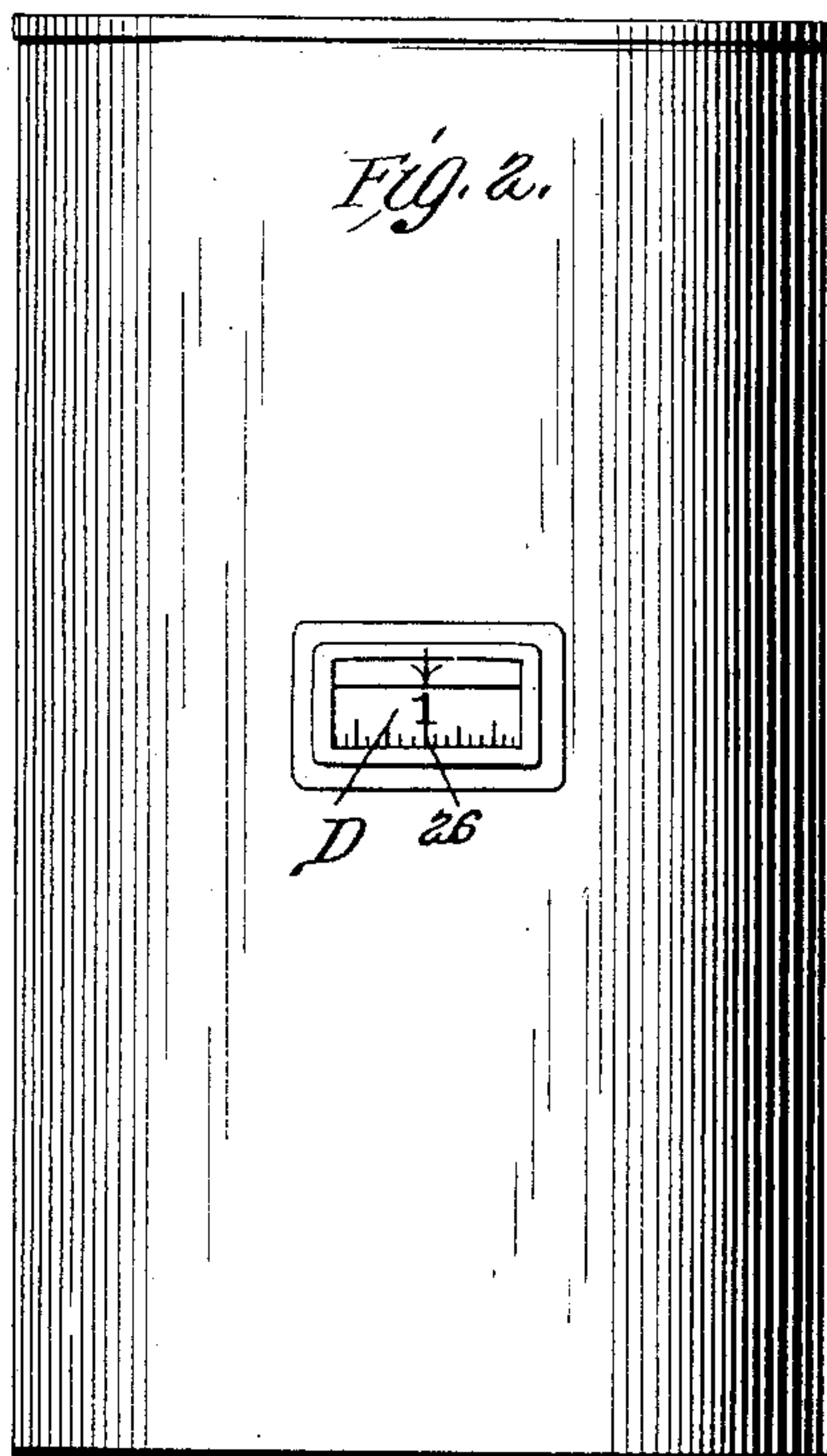
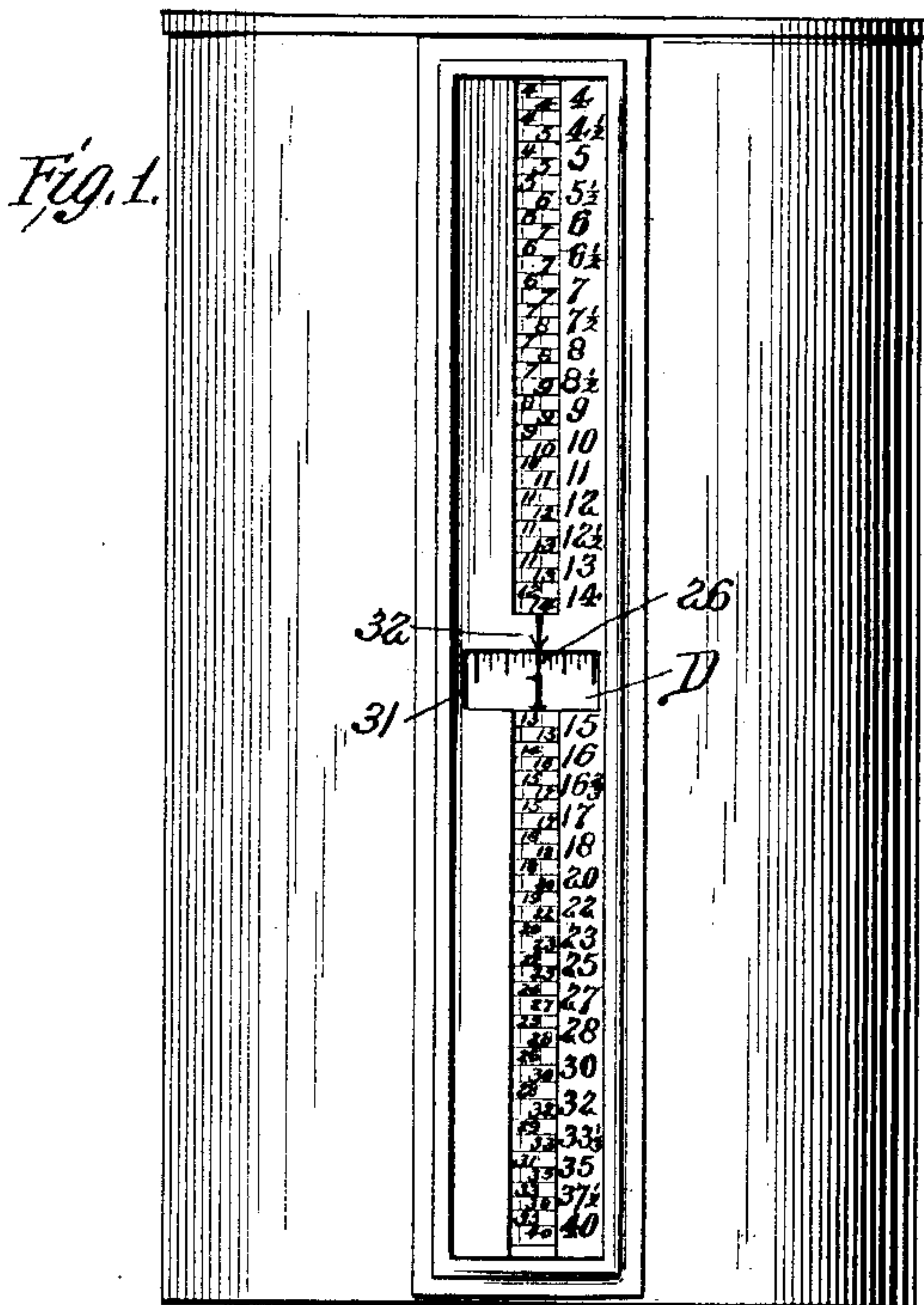
Patented Mar. 4, 1902.

W. F. HUMMER.  
AUTOMATIC COMPUTING SCALE.

(Application filed Feb. 2, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Attest  
Edw. L. Reed.  
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by Eli Spear Atty.

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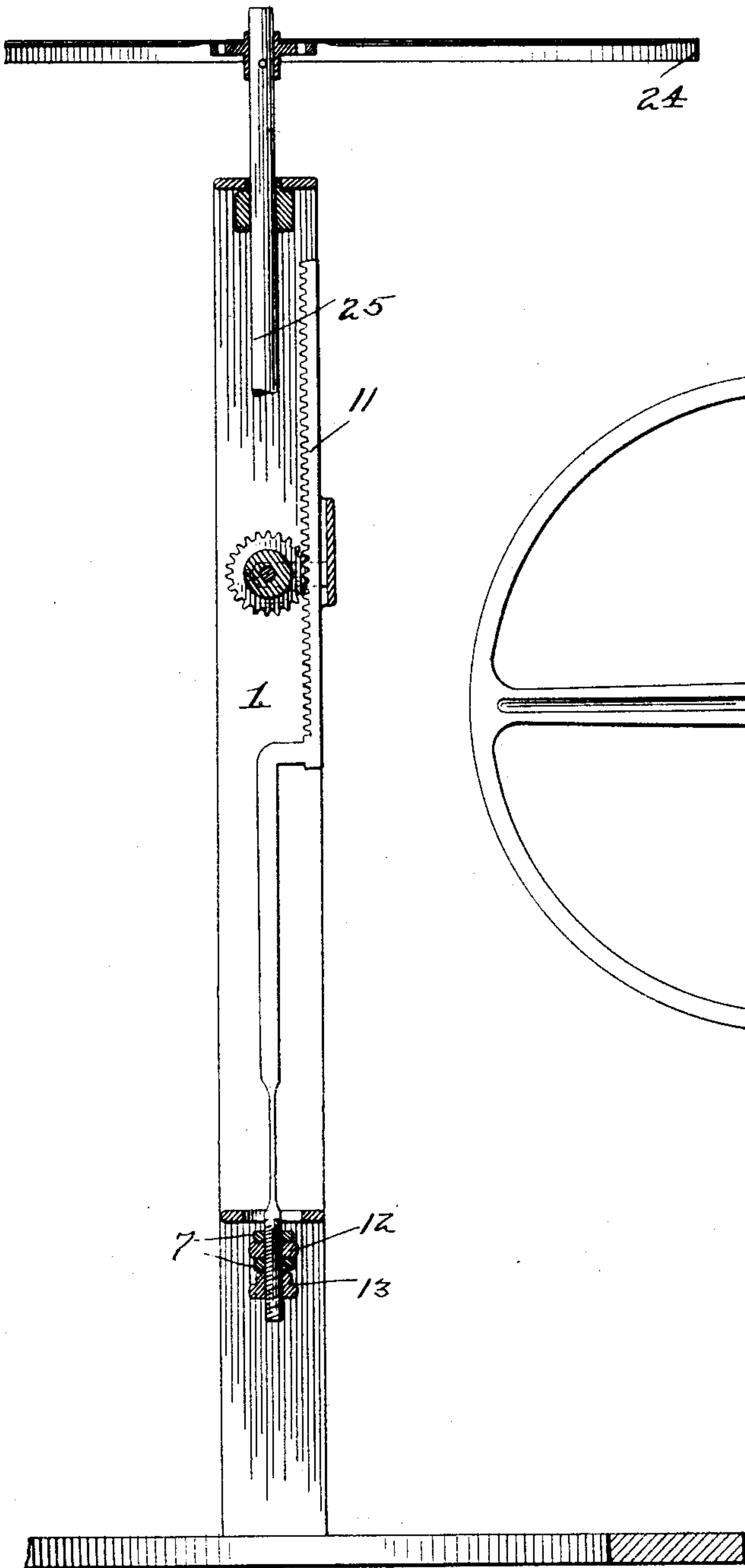
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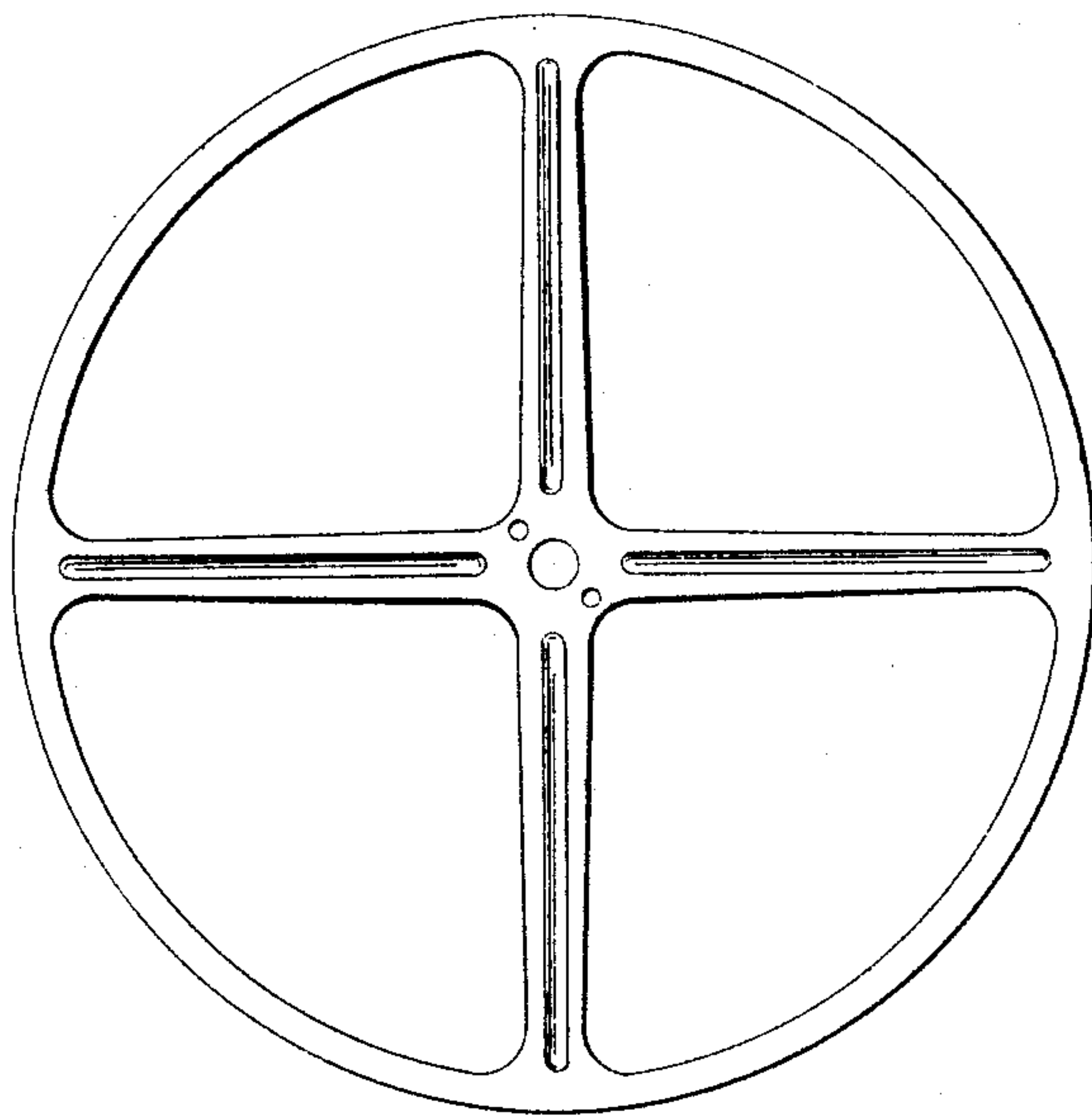
(No Model.)

2 Sheets—Sheet 2.

*Fig. 5*



*Fig. 6.*



attest:

*Malcolm Donaldson*  
*H. J. Doyle*

*Inventor:*  
*Wm F. Hummer*  
*By Ellis Spear*  
*Atty*



# UNITED STATES PATENT OFFICE.

WILLIAM F. HUMMER, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR  
TO THE COLUMBIAN AUTOMATIC COMPUTING SCALES COMPANY, OF  
WASHINGTON, DISTRICT OF COLUMBIA.

## AUTOMATIC COMPUTING-SCALE.

SPECIFICATION forming part of Letters Patent No. 694,647, dated March 4, 1902.

Application filed February 2, 1901. Serial No. 45,798. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM F. HUMMER, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Automatic Computing-Scales, of which the following is a specification.

My invention relates to automatic computing-scales of that class in which the article to be weighed acts upon rotary mechanism turning on a vertically-arranged axis to turn the parts in order to indicate the weight and the amount of the weight multiplied into the price per unit of weight.

The object of my invention is to simplify the parts and is also for the purpose of insuring accuracy and durability, as well as cheapness of manufacture, and, further, to improve the arrangement of numerals upon the cylinder for the purpose of greater perspicuity. It includes improvements on the form of scale shown in Letters Patent of the United States granted September 25, 1900, and numbered 658,732.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 shows an elevation of the apparatus in front view. Fig. 2 shows a rear view of the same. Fig. 3 is a sectional view showing a front elevation of the supporting-frame, springs, and other mechanism for operating the indicating parts of the apparatus. Fig. 4 is a cross-sectional view of the device, taken on line 4-4, Fig. 3. Fig. 5 is a detail sectional view through the frame and other parts. Fig. 6 is a detail plan view of the wheel for supporting the drum.

In these drawings the mechanism which moves the cylinder carrying the graduated and indicating weight-scale with the price computations is supported upon a ring A, which constitutes the base. This is preferably of cast metal. The supporting-frame is cast in one piece and consists of side standards 1, a flat supporting-bar 2, and rear vertically-arranged bar 3 and connecting cross-piece 4. The bar 2 is arranged horizontally and the bar 3 vertically on the rear edge of the standards. The top piece 4 is arranged horizontally.

The pan-hook (shown at 5) is supported by an eye 6, depending from and fixed to a vertically-movable cross-bar 7. The ends of this cross-bar are slotted for the purpose of receiving the connections with the springs B B. These springs are attached to the upper cross-bar 4 and are conveniently connected to the cross-bar 7 by flat strips of metal 8, connected to the lower ends of the springs and passing through slots in the cross-bar 2 into the slotted ends of the bar 7. The lower ends of the connecting-pieces 8 have a series of holes by means of which they are connected to the bar by pins 9 passing through holes in the slotted ends and through the holes in the connecting-strips, so that the strips are connected to the bar adjustably. The springs are also adjustably connected to the upper cross-bar by means of threaded extensions freely passing through holes in said cross-bar and being held therein by thumb-nuts 10. This allows accurate adjustment of the springs. The bar 7, to which the springs are connected, is held at a normal position by the cross-bar 2, which acts as a stop, so that when the adjusting-nuts 10 are turned the tension of the springs between the cross-bars 2 and 5 may be regulated to any required degree.

Adjustably fixed to the bar 7 is a vertical arm 11. Its lower end is threaded and passes freely through a vertical hole in the bar. This hole is intersected by a horizontal slot, in which is placed a thumb-nut 12, by means of which the vertical adjustment of the arm in relation to the bar is made. A jam-nut 13 on the lower end of the arm serves to hold the arm rigidly in place. The upper end of the arm is provided with an offset, from which a rack-bar extension rises in such position that it passes close to the vertical cross-bar 3. This bar 3 serves to keep the rack-bar in gear with pinion 14, which pinion is fixed to the shaft turning in bearings in arms 15, which are supported on the bar 3. Rigidly connected with the pinion is a bevel-gear 16 and coaxial therewith. This bevel-gear engages with a like gear on the hub 17, to which is fixed a vertical axial shaft 25, having its lower end supported in one of the brackets and its upper end passing through and turning in the



upper cross-bar 4. This shaft is held against vertical displacement by a sleeve 18, fixed to the shaft and bearing against the under surface of the cross-bar 4. On the upper end of the shaft is fixed a sleeve 20, carrying the horizontal disk 21, which directly supports the revolving drum.

The revolving drum is specially constructed for lightness and strength and is supported and turns solely upon the vertical shaft. On its upper end it is secured to the disk 21, composed of a light flanged rim and of spokes connecting this rim to the hub. This wheel is formed of thin sheet metal struck up, with horizontal flange 23 and vertical flange 24, against which latter the covering bears. The spokes are formed continuous with the flange 23 and hub and are preferably corrugated to give increased strength.

In order to give steadiness to the apparatus and to prevent undue jar by the return of the springs and other parts connected therewith when the weight is removed, I have provided a piston-and-cylinder attachment acting as an air-buffer. This consists of a cylinder 35, closed at its upper end and open at its lower. It is provided with a flange 36 at its open end and rests at that end upon the cross-bar 2, to which it is secured. It is provided with a piston 37 and piston-rod 38, which latter passes through the hole in the cross-bar and is attached rigidly to the movable cross-bar beneath, so that as the weight of the article to be sold draws down this cross-bar it pulls down the piston, and when the article weighed is taken off the piston acts as a buffer and prevents too sudden action, which might tend to distort the movable cylinder by strain upon its connecting-wheel at the upper end. The drum is rigidly connected to the upper rim of this wheel, and is thereby connected rigidly to the upper end of the vertical shaft 25, which lies in the axis of the drum, so that the drum is suspended on the upper end of this shaft and turns with it. As this wheel forms the only connection between the drum and the shaft and at the same time holds the upper end in shape, the maximum of lightness is secured, and as the shaft bears upon its lower end, which may be reduced to a point and turn in suitable step, the friction is reduced to a minimum. The drum D may be made of any light material suited to the purpose—such as thin paste-board, thin sheet metal, or any material well known for such purposes. The exterior of this drum is provided with peripheral band, preferably at the center of its length, and containing graduations representing units and fractions of weight. As shown, it is divided into eighteen major parts, representing pounds, by vertical lines 26, running across the entire width of the band. A greater or less number of the parts may be used. Each of these parts is further subdivided into sixteen, representing ounces, and the springs and other parts are so adjusted that in normal position the zero-point is visible at the opening

in the outer shell and each pound will turn the cylinder a distance equal to one of the major subdivisions, and so on in the manner ordinary to this class of weighing-machines. The outer case is cylindrical in form, like the drum, and is fitted to allow free movement of the drum, within it and retains it in place and prevents any displacement. It is preferably made of thin sheet metal and is fixed to the base, preferably by extending over the edge of the ring which forms the base, to which it is attached by screws. It is provided with a slot extending vertically from top to bottom, so as to disclose the vertical columns of figures upon the periphery of the revolving drum within. Opposite the zone upon the drum which bears the weight-scale above described is a transverse opening 31. The vertical slot has upon its margin figures indicating price per pound in order. As will be seen upon the drawings, these figures "4," "4½," "5," "5½," and so on increase consecutively downwardly, the construction and arrangement being, so far as the figures and the slot are concerned, of ordinary character. Upon the drum, however, I have devised the special arrangement of numerals. Figures upon this are arranged upon peripheral lines, as usual; but these lines are in pairs, one pair being assigned to each price figure upon the outer cylinder. The figures in these companion rows are arranged diagonally. Each row is divided into unit-spaces by vertical lines, and the lines of the lower row lie midway of the space between the lines of the row next above, so that corresponding figures in one row are displaced a distance of one-half a space in relation to the companion row. When the drum is turned, the figures of one row of each pair of companion rows (in this case the upper) come successively first to the opening in the case or outer shell opposite the price figures. For example, supposing the price to be four cents indicated by the figure "4" at the top of the column on the case, and the weight to be one pound, indicated by the figure "1" coming opposite the arrow on the cross-bar 32 connecting the two sides of the slotted plate, the figure "4" will appear on the center of the slot, indicating the product of four into one, or the amount of the whole. If the weight be greater, but less than a pound and a half, the figure "4" of the first row will disappear, but the figure "4" of the second row will remain in sight, and so on throughout the whole series. The same result would be accomplished by putting all the figures in one row; but this would make it necessary to reduce the size of the figures and to confuse and render difficult the working. I gain by this arrangement in clearness.

For further clearness I distinguish alternate double rows by means of different kinds of colors of figures. Preferably for this distinction I make alternate price figures on the case-scale red, while the other alternates are black, and print the figures on the correspond-



ing companion series on the revolving drum in the same colors or of the same kind.

It will be understood that the numbers on the companion lines at whatever point are arranged vertically to correspond to the weight figures on the drum and so that the amount on any one of these spaces comes vertically opposite its weight figure on the revolving drum as one multiple and the price figure on the case as another multiple; but this arrangement is well known.

The peripheral lines of figures in numerical order upon the drum indicating the weight may be duplicated for the purpose of exhibiting to the customer the amount of the weight at an opening at some other point in the case. Preferably this is placed upon the opposite side from the opening toward the user. In this case the line of figures is in the same direct order, but displaced a half-circumference, so as to show the same weight on the opposite side. This duplication of the rows and holes is sometimes convenient.

I claim—

1. In combination in a scale, a frame comprising side pieces 1, a horizontally-arranged cross-piece 2, a spring with its connection leading therefrom, a rack-bar, said cross-piece having openings for the passage of the spring connection and the rack-bar and a carrying-bar to which the spring and rack-bar are connected, said horizontal cross-piece serving as a stop for the said carrying-bar, substantially as described.

2. In a weighing and computing scale, and in combination, the gear mechanism including a rack-bar and pinion, a base and a frame composed of side pieces 1, and a cross-bar 3 arranged with its broader face in vertical plane,

and on the rear of the sides, and serving to support the bracket holding the gear mechanism, and to keep the rack-bar in mesh, substantially as described.

3. In combination with the frame having cross-bar 3, the brackets, the pinion and bevel-gear on shaft turning in said brackets, and rack-bar turning said pinion, said cross-bar serving to hold the rack-bar in mesh with the pinion, a vertical shaft carrying bevel-gear in mesh with bevel-gear on the said shaft, said vertical shaft having bearing on one bracket and carrying the drum, substantially as described.

4. In combination, the frame having an upper cross-bar 4 and a lower cross-bar 2, a spring attached to the upper cross-bar, a connection from said spring extending below the cross-piece, a cylinder supported at its lower end upon the lower cross-piece, a piston and piston-rod for said cylinder, a cross-bar 7 below the cross-bar 2, said piston-rod and spring being connected thereto, substantially as described.

5. In combination in a weighing and computing scale, a vertical shaft, mechanism for turning the shaft, a frame in which said mechanism is supported, said shaft having its upper end extending above said frame, a drum attached to the upper extension of the shaft and depending over said frame and turning mechanism to rotate freely about the same, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM F. HUMMER.

Witnesses:

HENRY E. COOPER,  
WM. F. HALL.