

No. 734,383.

PATENTED JULY 21, 1903.

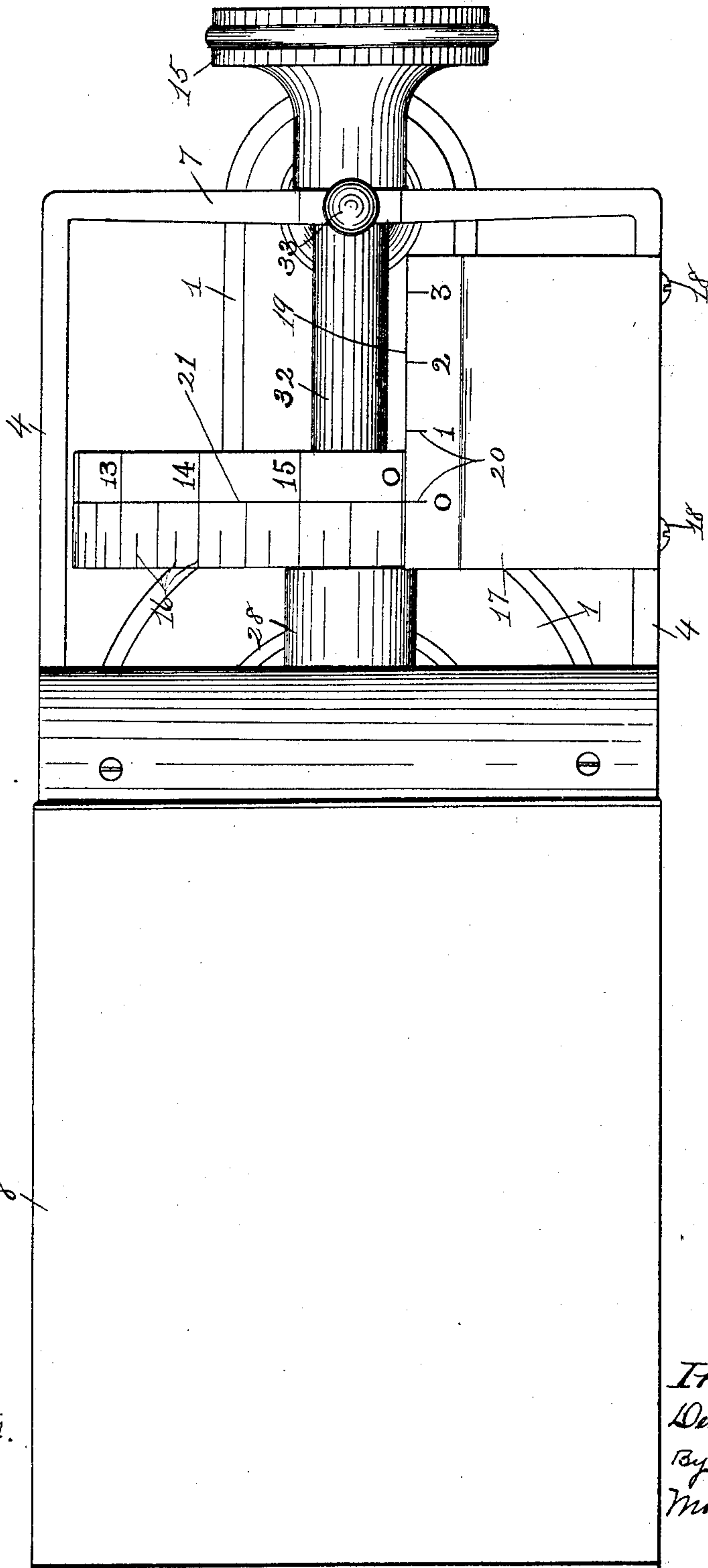
D. J. WHELAN.
SCALE.

APPLICATION FILED DEC. 14, 1900.

NO MODEL.

4 SHEETS—SHEET 1.

Fig. 1.



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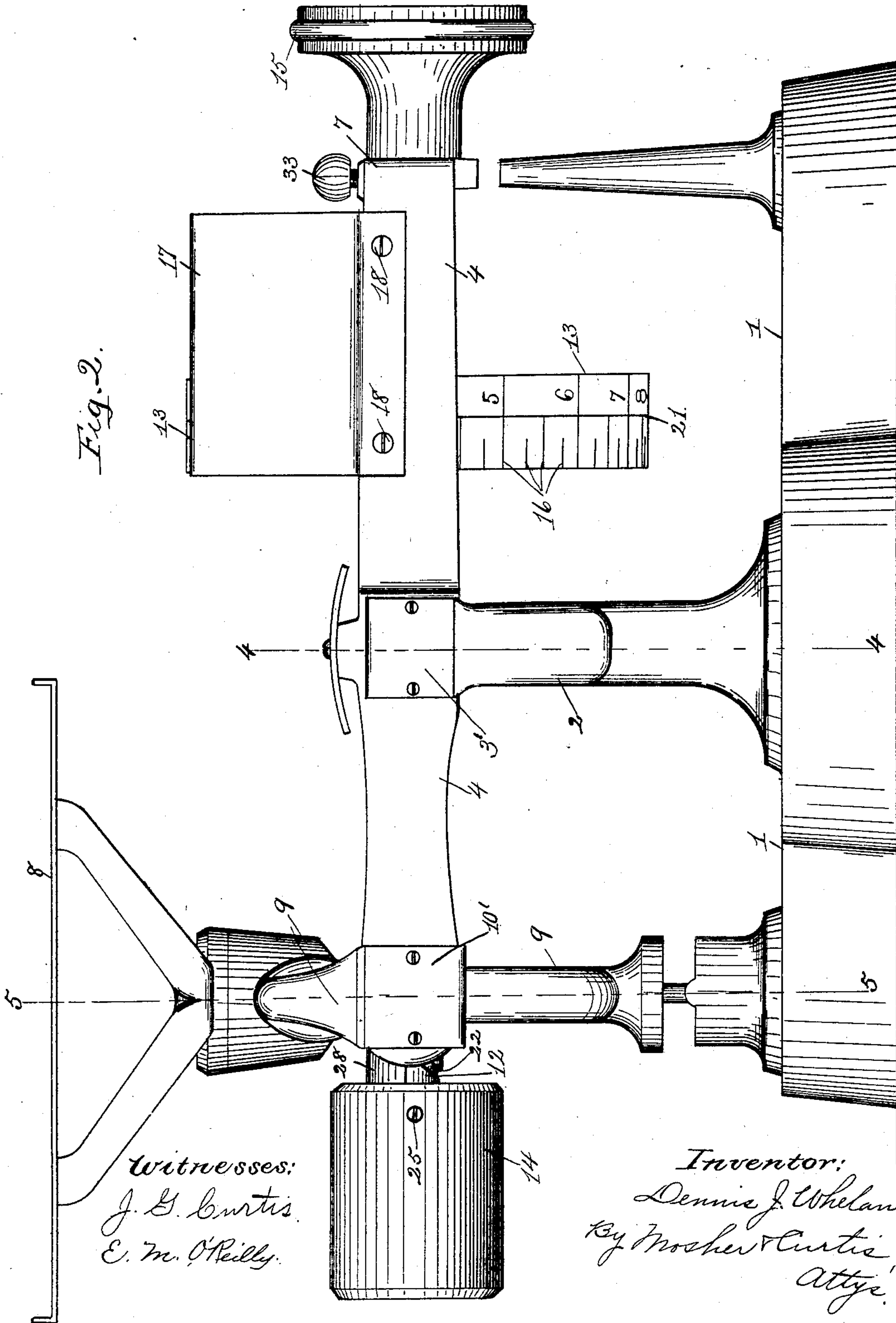
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4 SHEETS—SHEET 2.

Fig. 2.



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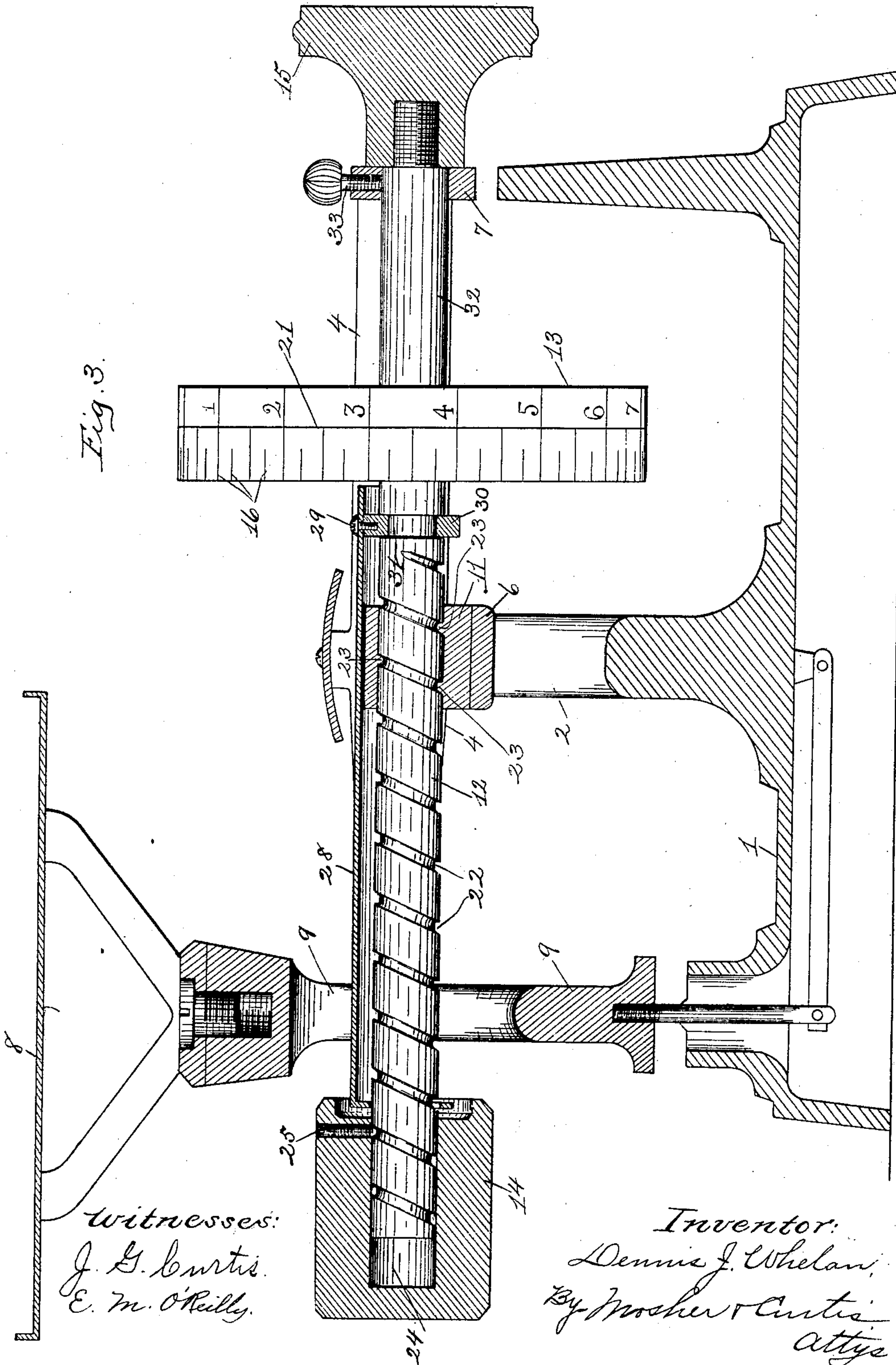
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4 SHEETS—SHEET 3

Fig. 3.



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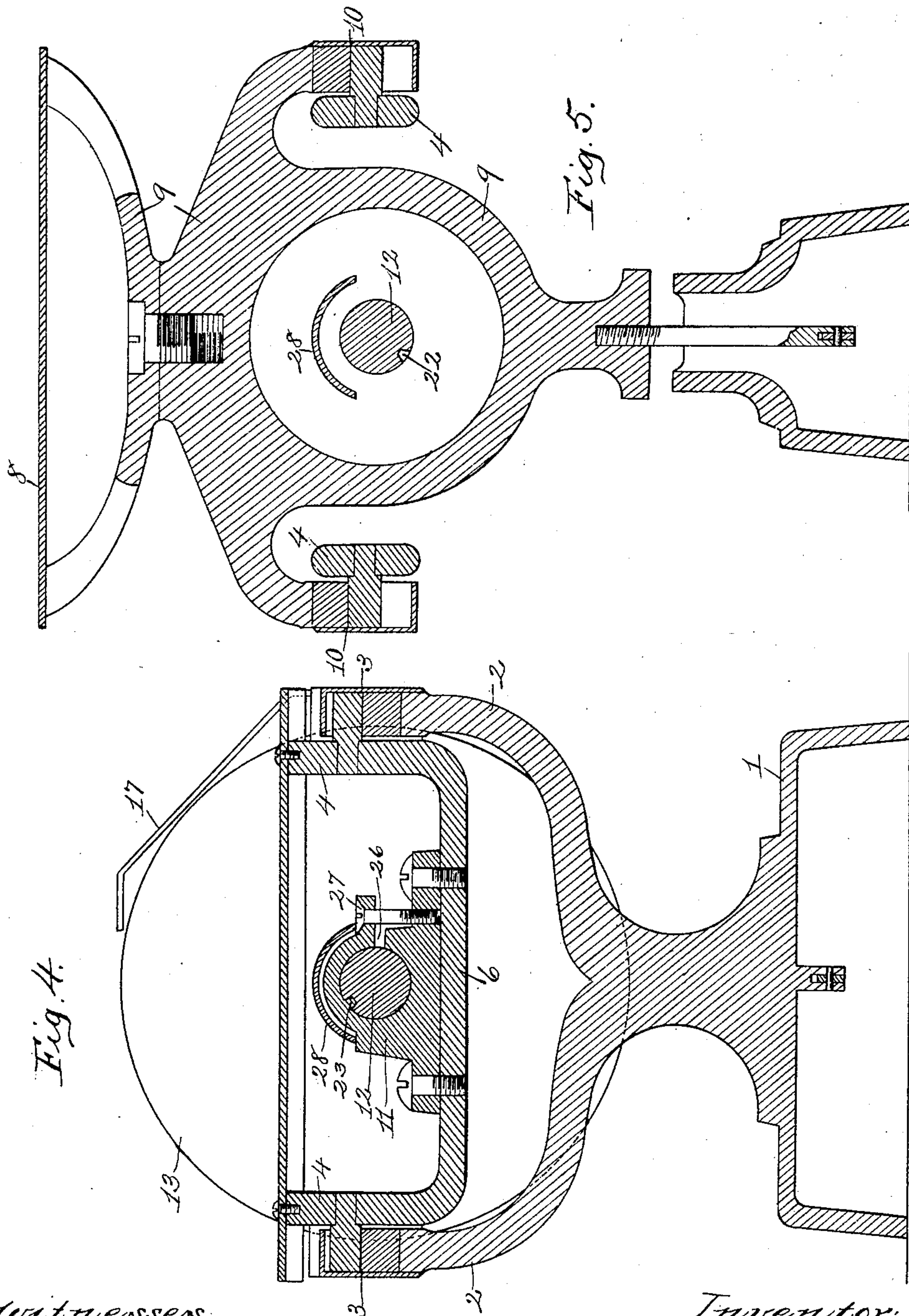
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APPLICATION FILED DEC. 14, 1900.

NO MODEL.

4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

DENNIS J. WHELAN, OF TROY, NEW YORK.

SCALE.

SPECIFICATION forming part of Letters Patent No. 734,383, dated July 21, 1903.

Application filed December 14, 1900. Serial No. 39,841. (No model.)

To all whom it may concern:

Be it known that I, DENNIS J. WHELAN, a citizen of the United States, residing at Troy, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Scales, of which the following is a specification.

The invention relates to such improvements; and it consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the reference characters marked thereon, which form a part of this specification.

Similar characters refer to similar parts in the several figures.

Figure 1 of the drawings is a top plan view of my improved weighing-scale. Fig. 2 is a view in side elevation of the same. Fig. 3 is a central vertical longitudinal section of the same. Fig. 4 is a cross-section of the same, taken on the broken line 4 4 in Fig. 2. Fig. 5 is a cross-section of the same, taken on the broken line 5 5 in Fig. 2.

My invention relates to beam-scales, and more particularly to that class wherein a weight-carrying shaft is supported by the scale-beam and capable of screw movements thereon.

Referring to the drawings, the base 1 is provided with the uprights 2, containing in their upper ends bearings 3 for the side bars 4 of the scale-beam, which are connected intermediate of their ends by a cross-bar 6, approximately at their point of bearing upon the uprights 2.

The side bars of the scale-beam are connected at one end by an end bar 7 and at the other end support a weighing-pan 8 or the like mounted upon a frame 9, having bearing connections at 10 with such side bars.

Upon the cross-bar 6 of the scale-beam is fixedly secured the separate nut-bearing 11, adapted to receive, fit, and support a screw-shaft 12 and permit the same to have a screw movement on the scale-beam. The cross-bar 6 is depressed, as shown, so that when the separate bearing 11 is applied thereto the screw-shaft will be maintained in the same plane with the side members of the frame of the beam. This shaft is preferably extended

through the end bar 7 of the scale-beam, having a loose bearing therein. This screw-shaft is provided on opposite sides of its nut-bearing with the cylindrical weight 13, fixed upon the shaft, and the counterpoise 14, adjustably fixed upon said shaft. The screw-shaft is preferably provided with an operating-handle 15, whereby the same can be rotated to produce a screw movement thereof relatively to the scale-beam to cause the weight 13 to move toward and from its nut-bearing, which movement causes the weight to act with varying force in balancing an object placed upon the weighing-pan. This cylindrical weight is provided with a graduated scale 16, perimetrically arranged thereupon and adapted to be read in connection with an indicator-plate 17, fixed upon the scale-beam, as by screws 18, the upper edge 19 of which plate forms an indicator located in proximity to said perimetrical scale. The indicator may be formed in any known manner. This indicator-plate 17 is also provided with a graduated scale 20, adapted to be read in connection with an indicator carried by said weight, the weight being provided with a peripheral line 21, which may be formed in any known manner in close proximity to said scale 20, to serve as an indicator therefor. The spiral or screw portion of the shaft is preferably so formed that one complete rotation of the shaft will move the weight relatively to the scale-beam the exact distance necessary to vary its weighing power the amount of one unit of weight, as one pound, and the perimeter of the weight is divided by the perimetrical scale into equal portions, representing subdivisions of the unit of weight, as ounces and fractional parts thereof.

Graduations of the scale 20 on the indicator-plate 17 are so located as to be read as multiples of the unit of weight—that is, as pounds. The full reading of the scale is therefore always the highest number of pounds indicated upon the scale 20 plus the ounces and parts thereof indicated upon the perimetrical scale 16. The spiral portion of the screw-shaft may be formed in any known manner, as by the spiral groove 22, formed in said shaft and adapted to receive and fit the spiral rib 23 on the interior of the nut-bearing. The spiral groove is preferably con-

tinued to the end of the shaft, which receives the counterpoise. The counterpoise has a smooth bore 24, adapted to receive the end of the shaft, and is provided with a guiding and locking screw 25, inserted through the wall of the counterpoise interiorly thereof and adapted to enter and fit the spiral groove in the inserted shaft. For purposes of adjustment of the counterpoise this screw is inserted loosely into the spiral groove in the shaft, which converts the smooth-bored counterpoise into a nut which can be adjusted very accurately by a screwing movement upon the shaft. When the counterpoise has been adjusted in the desired position, it can be locked in such position by tightening the set-screw and forcing it tightly into the spiral groove in the shaft. I am thus able to secure all the advantages of the screw movement in adjusting the counterpoise without the expense of interiorly screw-threading the same.

To prevent wear of the screw-shaft, the same is preferably made of harder metal than the bearing-box 11, and the bearing-box is provided with a laterally-opening slot 26, which permits the divided portion of the box to be drawn together by the screw 27 to compensate for wear upon the bearings. By extending the slot 26 laterally instead of downwardly a continuous semicylindrical bed is provided, upon which the weighted shaft rests, and the shaft is not brought by gravity against the slot edges. The shaft is also provided with a shield or cover 28, overlying its spiral portion and preferably of concavo-convex form in cross-section. This shield or cover is connected at one end by the screw 29 with a ring or sleeve 30 loosely fitting a peripheral groove 31, formed in the shaft beyond its spiral portion, such connection permitting a rotary movement of the shaft relatively to the cover and at the same time causing the cover to partake of the longitudinal movements of the shaft. Rotary movement of the cover is prevented by its engagement with the upper surface of the bearing-box 11, upon which it slides back and forth as it accompanies the shaft in its longitudinal movements. This cover not only excludes dirt from the spiral groove, but serves as a shield to prevent the accurately-formed shaft from being marred or injured by falling objects.

The end of the shaft which passes through the end bar 7 of the scale-beam is left plain, as shown at 32, and is adapted to be engaged by the set-screw 33 to lock the shaft to the scale-beam in adjusted positions and prevent the weight-actuating screw movements of the shaft. The shaft can thus be adjusted for a given weight and then locked in such adjusted position, thus permitting the repeated use of the scale in measuring quantities of goods of uniform weight without danger of displacement.

The cross-bar 6 of the scale-beam has bear-

ings of usual knife-edge form at 3 in the uprights 2, as indicated in Fig. 4, and the said side bars support the frame 9 upon like bearings 10, as indicated in Fig. 5. These bearings have casing 3' and 10', respectively, as indicated in Fig. 2.

The several graduated scales are provided with numerical indications, as shown, those on the cylindrical weight being arranged around its perimeter in such manner that the fixed indicator-plate 17 will cover and conceal the larger of two successive numbers adjacent to its upper edge. By such an arrangement the reading of such scale is always the largest number visible adjacent to the edge of said plate plus the fractional indications between said number and said edge, and a correct reading can thus be had without mathematical calculation.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a weighing-scale, the combination with a weight-carrying shaft having a spiral portion; of a scale-beam having a bearing with a spiral portion adapted to receive and fit the spiral portion of said shaft; and a cover for said shaft having a pivotal connection therewith, said cover overlying said shaft and bearing and being adapted to partake of the longitudinal movement only of said shaft, substantially as described.

2. In a weighing-scale, the combination with a scale-beam comprising side members connected intermediately of their ends by a depressed cross-bar; of a nut-bearing mounted on the upper side of said cross-bar; and a weight-carrying screw-shaft supported in said bearing in the same plane with the side members of the frame, substantially as described.

3. In a weighing-scale, the combination with a scale-beam comprising side members connected intermediately of their ends by a cross-bar; of a nut-bearing, mounted on said cross-bar, having a laterally-opening slot; a weight-carrying screw-shaft located in said bearing and resting by gravity upon a semicylindrical section thereof; and means for adjustably varying the compression of the slotted bearing upon said shaft, substantially as described.

4. In a weighing-scale, the combination with a weight-carrying shaft having a spiral groove; and a nut-bearing therefor; of a counterpoise having a smooth bore adapted to receive said grooved shaft, and a guiding and locking screw inserted through the wall of said counterpoise interiorly thereof and adapted to enter and fit the spiral groove in said shaft, substantially as described.

In testimony whereof I have hereunto set my hand this 17th day of November, 1900.

DENNIS J. WHELAN.

Witnesses:

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