No. 801,558. PATENTED OCT. 10, 1905.

C. G. STRUBLER.

SCALE.

APPLICATION FILED MAR. 11, 1905.

4 SHEETS—SHEET 1.

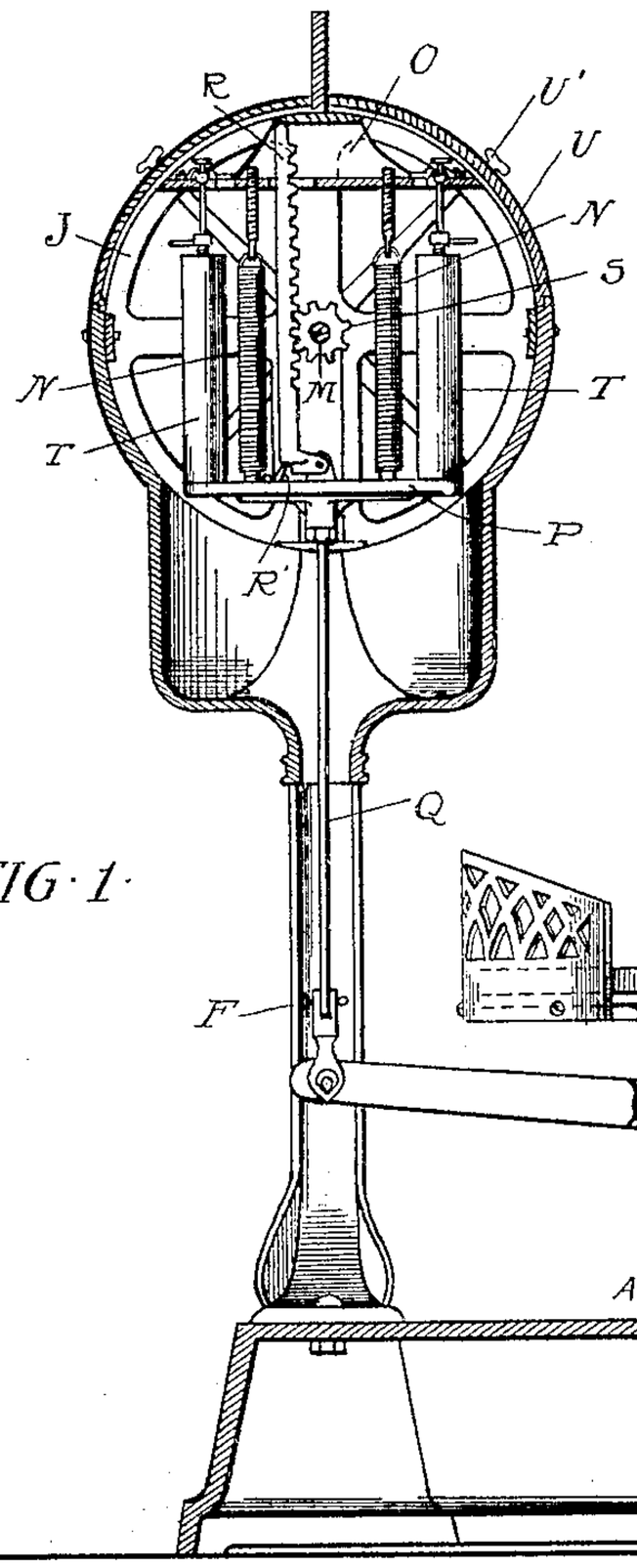

FIG. 1.

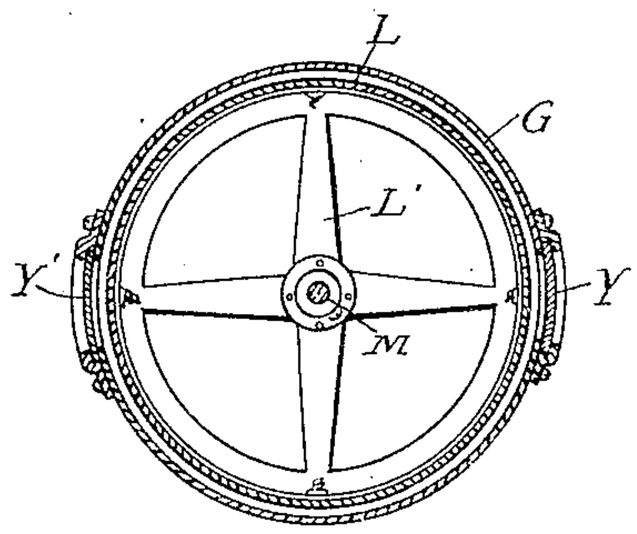

FIG. 3.

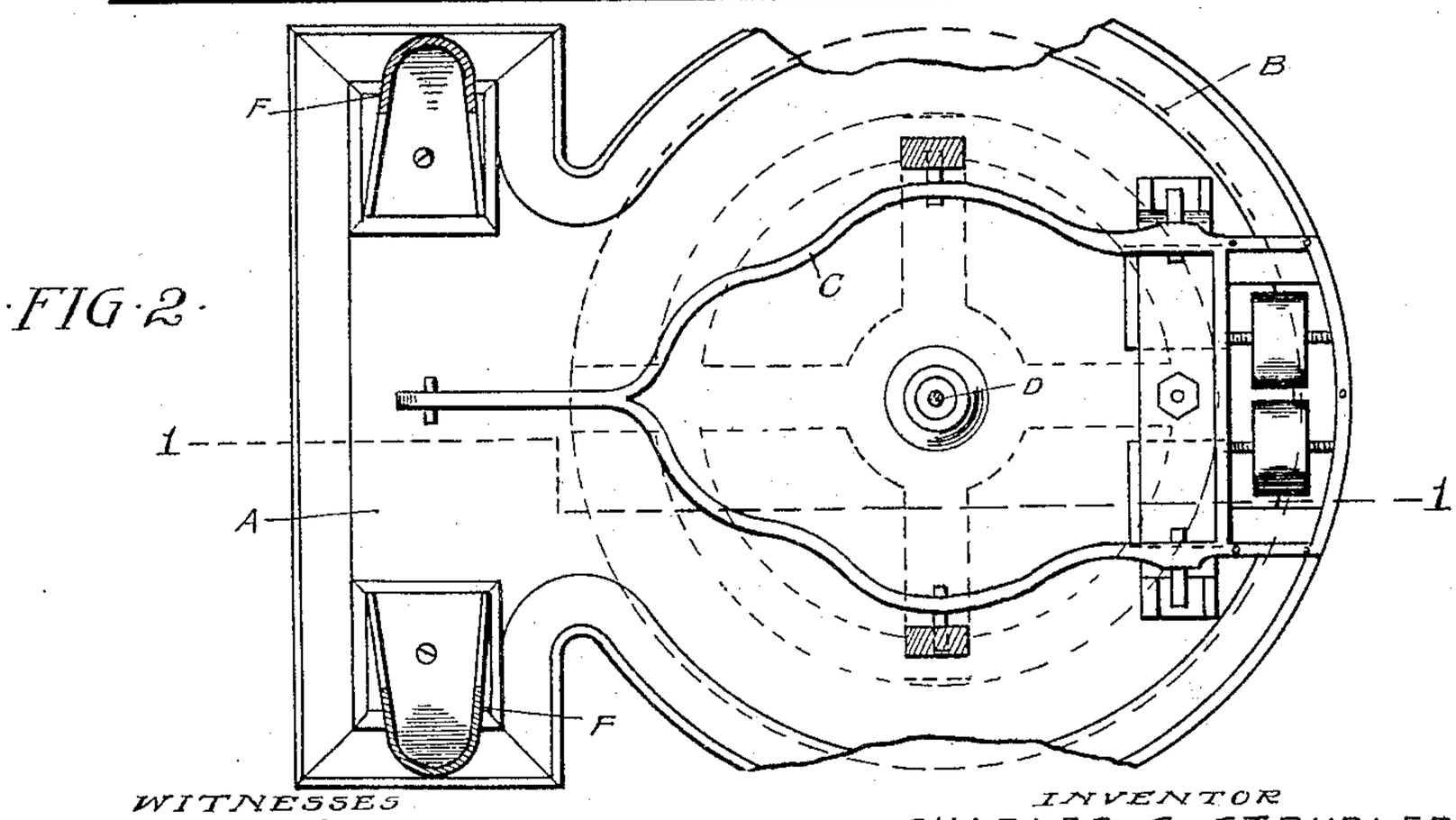

FIG. 2.

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4 SHEETS—SHEET 2.

FIG. 4

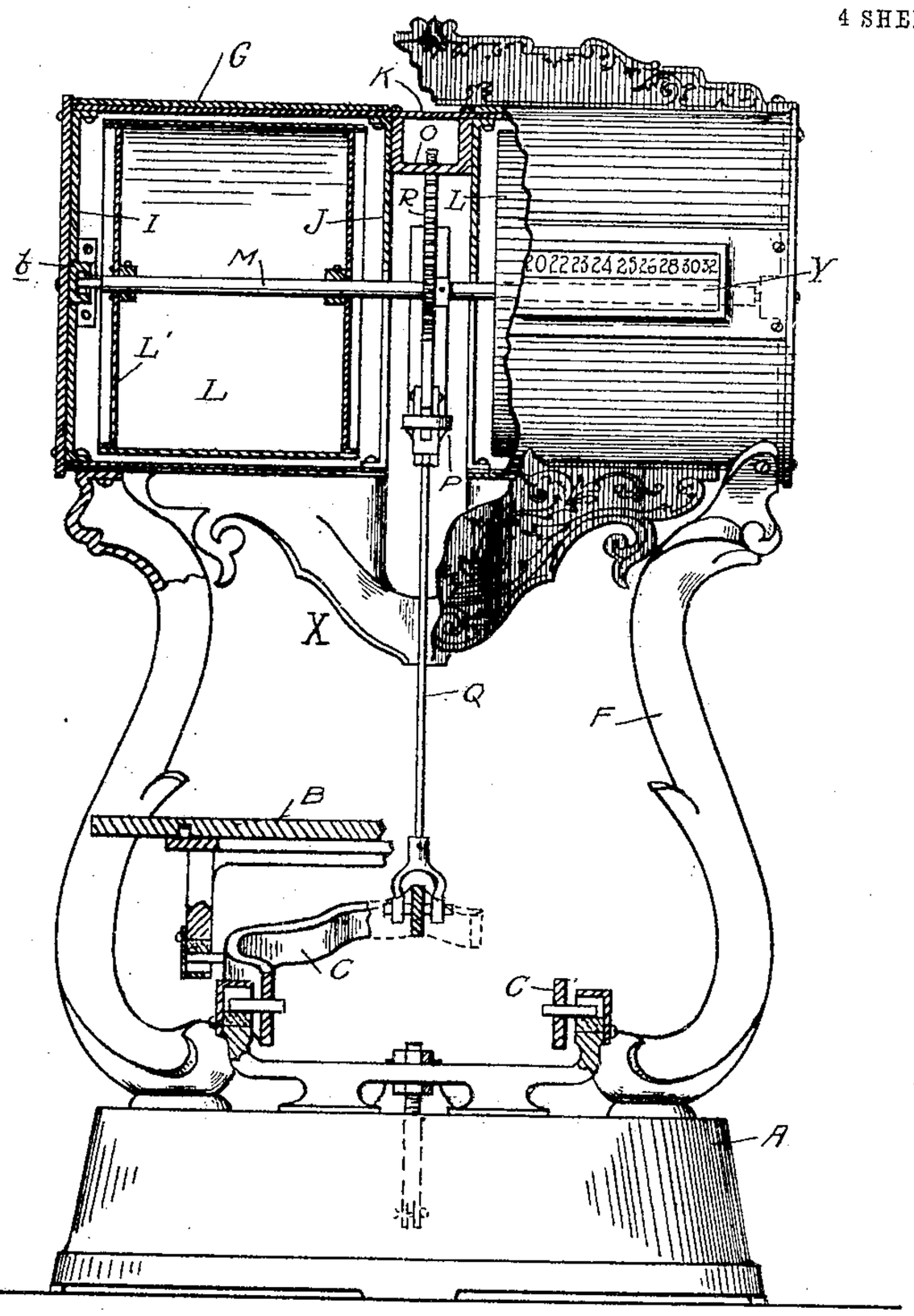

FIG. 5.

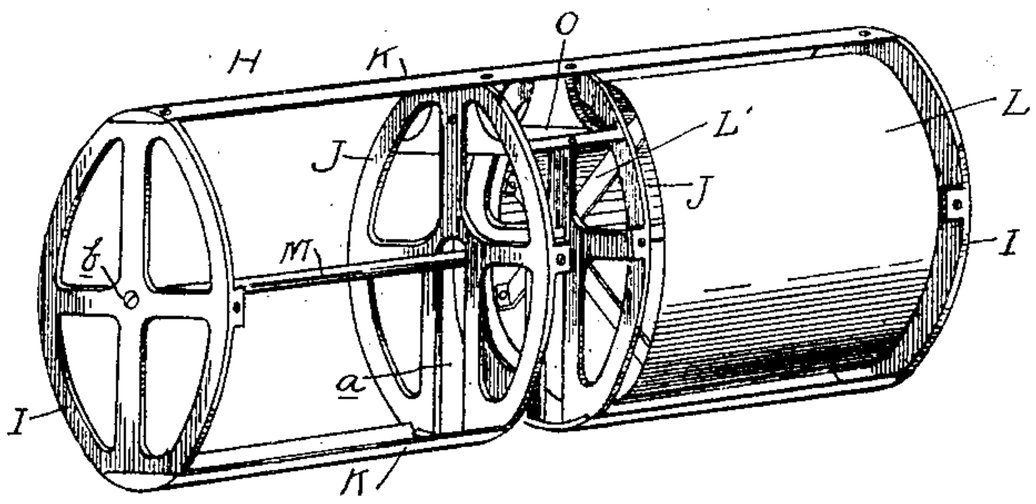

FIG. 6.

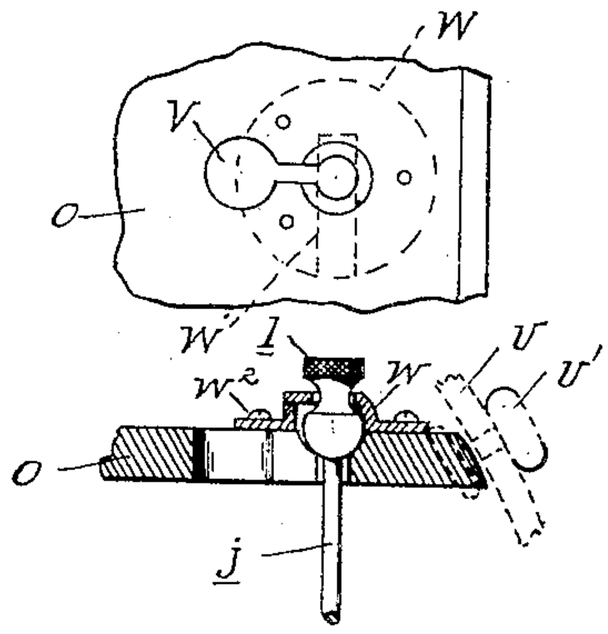

FIG. 7.

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4 SHEETS—SHEET 3.

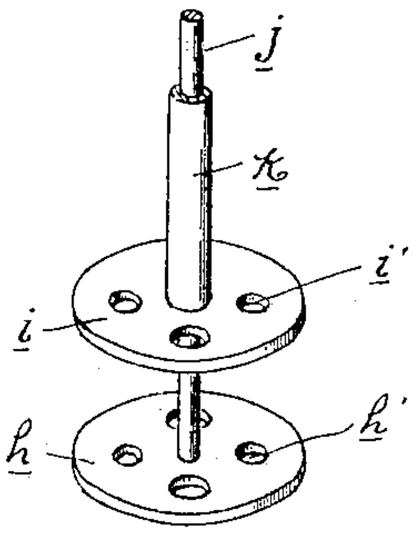

FIG. 10.

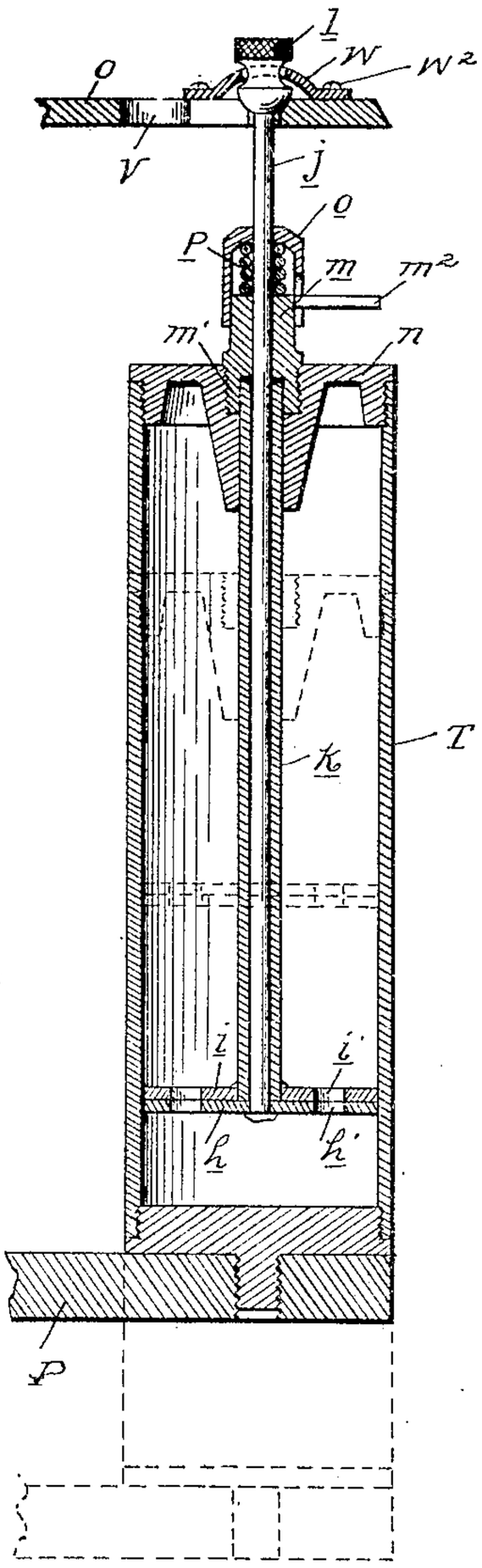

FIG. 8.

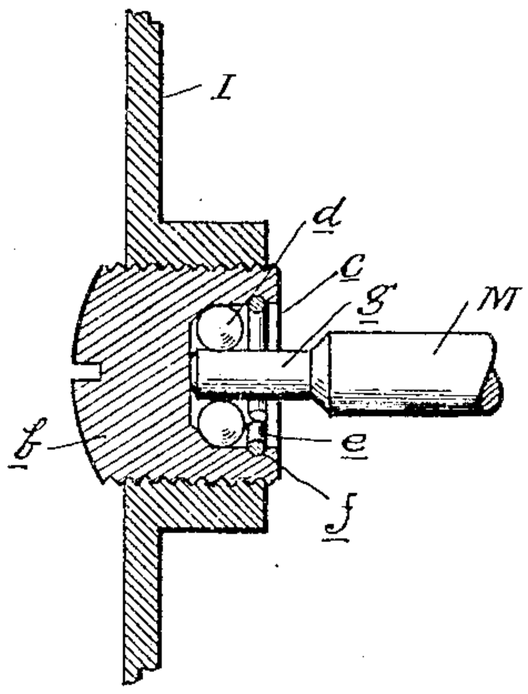

FIG. 11.

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No. 801,558. PATENTED OCT. 10, 1905.

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SCALE.

APPLICATION FILED MAR. 11, 1905.

4 SHEETS—SHEET 4.

FIG. 13.

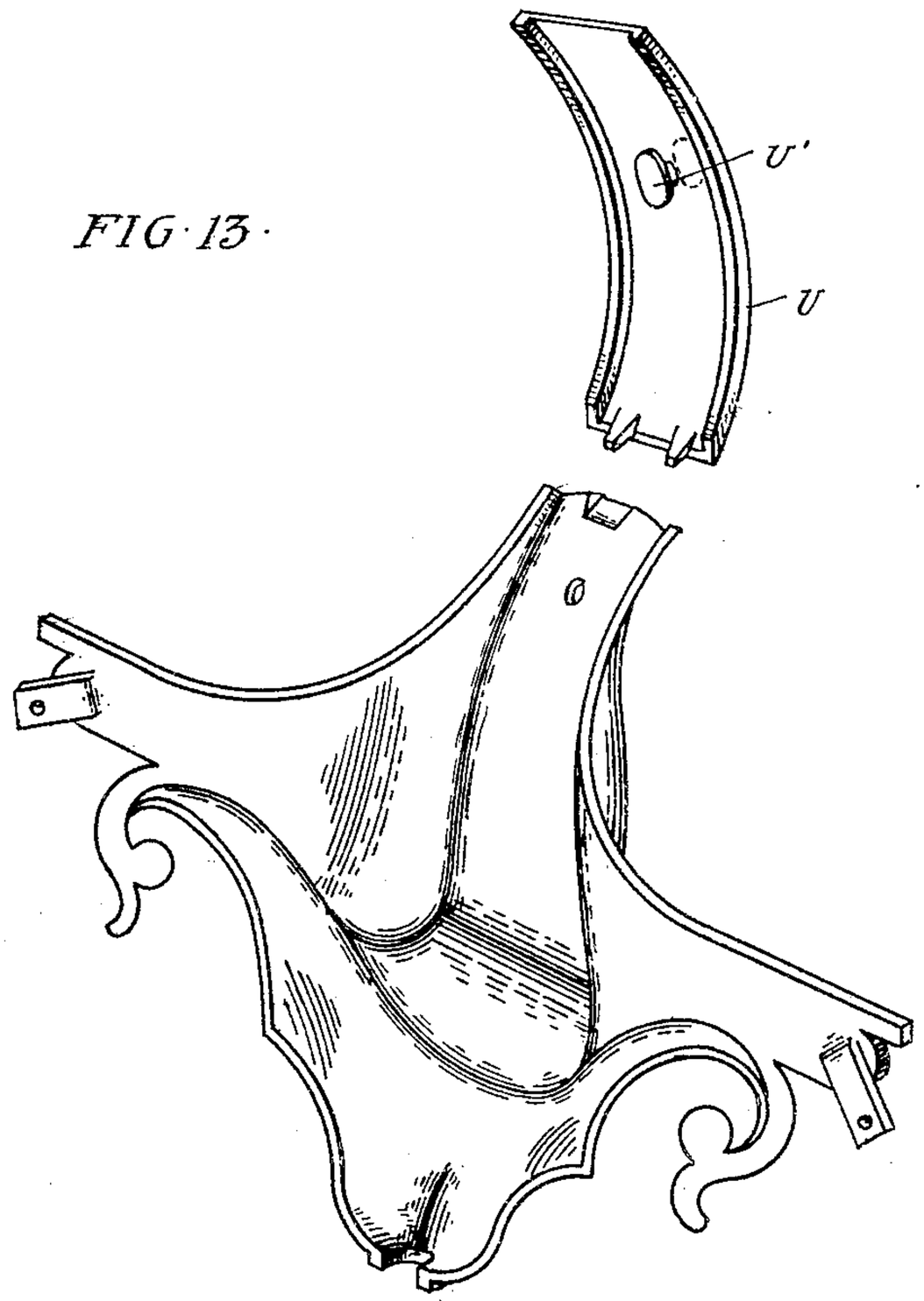
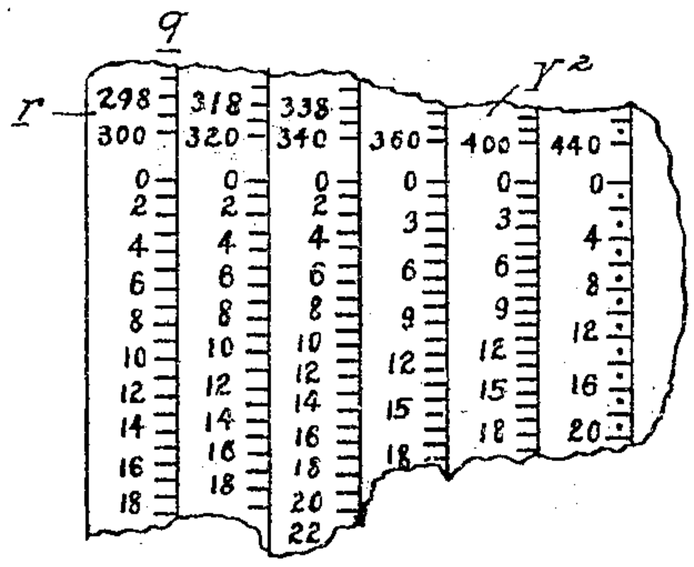


FIG. 12.



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UNITED STATES PATENT OFFICE.

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SCALE.

No. 801,558. Specification of Letters Patent. Patented Oct. 10, 1905.

Application filed March 11, 1905. Serial No. 249,596.

To all whom it may concern:

Be it known that I, CHARLES G. STRUBLER, residing at Detroit, in the county of Wayne and State of Michigan, a citizen of the United States, have invented certain new and useful Improvements in Scales, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to scales, and more particularly to scales of the computing type; and the invention consists in certain features of construction, as hereinafter set forth.

In the drawings, Figure 1 is a longitudinal section through the scale. Fig. 2 is a horizontal section below the platform, illustrating the base and platform-supporting lever. Fig. 3 is a cross-section through the computing-cylinder and its inclosing casing. Fig. 4 is a front elevation partly in section. Fig. 5 is a perspective view of the frame in which the computing-cylinder is journaled. Figs. 6 and 7 are respectively a plan and vertical section illustrating the means of detachably securing the dash-pot. Fig. 8 is a longitudinal section through the dash-pot. Fig. 9 is a perspective view of the plunger. Fig. 10 is an elevation of the locking device for holding the dash-pot from movement. Fig. 11 is a section through the ball-bearing support for the computing-cylinder. Fig. 12 is an elevation of a portion of the computing-cylinder, illustrating the markings thereof. Fig. 13 is a perspective view of the removable portions of the casing for the computing-cylinder detached.

A is the base, above which is arranged the platform B, supported upon the bifurcated lever C and having the depending rod D and pivotal link E for maintaining it in equilibrium. F represents columns rising from the base A and supporting at their upper ends a cylindrical casing G, in which is arranged the computing-cylinder, the weighing-springs, and retarding device.

H is a frame preferably formed of the heads I and J and the longitudinal connecting-bars K. The heads I are arranged at opposite ends of the frame, while the heads J are intermediate the ends and upon opposite sides of the longitudinal center. The spaces left between the heads I and J are adapted to receive the computing-cylinder, which is formed in two sections arranged upon opposite sides of the center. The space between the heads J receives the weighing-springs and retarding device, and the arrangement is such that these parts are completely housed within a cylindrical outer casing inclosing the frame H.

The computing-cylinders L are mounted upon spider-frames L′, which are secured to the shaft M, and the latter is journaled in bearings secured to the heads I. To permit of inserting the shaft in position in the frame H, the heads J are provided with the slots *a*, which extend from periphery to center. The bearings *b*, in which the shaft is journaled, are preferably ball-bearings constructed as illustrated in Fig. 11, in which *b* is a threaded plug engaging a correspondingly-threaded aperture in the center of the frame I. This plug is recessed at *c* to form a race for the balls *d*, and these are retained in position by a spring-ring *e*, engaging an annular groove *f*. The ends of the shaft M are preferably reduced in diameter at *g* to engage the bearing. With this construction the shaft may be placed in position by screwing the plugs *b* outward, so as to permit of engaging the ends of the shaft by an endwise movement. The plugs are then screwed in to hold the shaft in position.

Weighing-springs N are arranged within the space between the heads J and are attached to a cross-head O, extending between the heads J and secured thereto and also to the longitudinal bar K. The lower ends of the springs N are attached to a cross-head P upon a draw-bar Q, which extends downward and is attached to the end of the lever C. R is the rack, pivotally connected to the cross-head P and engaging the pinion S on the shaft M, a spring R′ yieldingly holding the teeth of the rack and pinion in mesh. Adjacent to the springs N and within the space between the heads J are also arranged dash-pots T for retarding the movement of the lever. For this purpose I preferably employ oil dash-pots, for the reason that they are more uniform in their action than air dash-pots, which are apt to become corroded and interfere with the proper freedom of movement. The oil dash-pots, on the contrary, are always lubricated and can be adjusted to retard the movement to any degree desired. As shown, this adjustment is formed by providing register-disks *h* and *i*, the former being secured to a stem *j* and the latter to a sleeve or tubular stem *k* upon the stem *j*. *l* is a grooved and knurled

head at the upper end of the stem *j*, and *m* is a head upon the tubular stem *k*, which is provided with a threaded portion *m'*, adapted to be engaged with a correspondingly-threaded socket in the cap *n*, inclosing the upper end of the dash-pot. *o* is a recessed cap secured to the stem *j* and fitting over the head *m*, and *p* is a spring sleeved upon the stem within the recess of the cap *o* and bearing against the head *m*. The arrangement just described is such that by turning the knurled head *l* the disks *h* may be rotated in relation to the disks *i* so as to form an opening in the corresponding apertures *h' i'* in said disks. The head *m* may also be rotated to engage the threaded portion *m'* with the cap *n*, a handle-bar m^2 serving to facilitate its rotation. When the thread is thus engaged, the plunger will be locked in fixed relation to the dash-pot, and thus will form a rigid tie between the head O of the frame and the cross-head P of the draw-bar, so as to prevent movement of the parts of the scale during shipment. By unscrewing the head *m* the stem of the plunger will be free to permit the movement of the draw-bar.

It will be observed that with the construction as above described the weighing-springs, rack, pinion, and dash-pots are all arranged within the cylindrical casing which incloses the computing-cylinders. The placing of the dash-pots in this position is advantageous, as it is desirable to keep them free from dirt, and where they are arranged below the platform within the scale-space there is greater danger of material being deposited upon the dash-pots and interfering with their free operation. This location is also a convenient one for access to remove the dash-pots when necessary or to lock or unlock them. I have therefore provided the cylindrical casing inclosing the computing-cylinders with detachable lids U, which cover the upper portion of the space between the heads J of the frame and are preferably secured in position by a turnbuckle U'. When these lids U are removed, the dash-pots and springs are accessible, and to permit of removing the former they are preferably attached to the head O, as illustrated in Figs. 6 and 7. As is shown, the cross-head O is provided with a slotted aperture V, one end of which is of sufficient size to permit of passing therethrough the knurled head *l* of the stem *j*. The opposite end of the slot is but slightly larger than the diameter of the stem and is surrounded by a concave socket, in which the convex lower end of the head *l* engages. This forms, in effect, a universal joint for a pivotal connection between the stem and the head O.

W is a cap above the spherical portion of the head *l* and engaging with the groove therein, this cap being slotted, as indicated in dotted lines in Fig. 6 and W', to permit of engaging with said groove. The cap is secured in position by screws W^2, so that the slot W' is arranged at right angles to the slot V. Thus the head *l* will be held normally from displacement; but at any time by removing the screws W^2 and slipping off the cap W the stem *j* may be sprung laterally to shift the head *l* into alinement with the large end of the slot V, and then by an endwise movement of the stem the head *l* may be disengaged from the cross-head O.

In normal position of parts where there is no weight upon the scale-platform the springs, dash-pots, and rack will all be within the circle of the cylindrical casing. When, however, the platform is depressed and movement is communicated, through the lever C, to the draw-bar F, the cross-head P will be lowered against the tension of the springs N and will carry down with it the dash-pot cylinders T. To accommodate this movement, I have provided a downwardly-extending housing X in below the center of the cylindrical casing, of sufficient size to receive the parts moving downwardly with the draw-bar. This arrangement imparts to the scale a much more pleasing appearance than where the normal position of the springs is above the cylindrical casing and which necessitates an upward projection of the housing to receive these parts. With my construction the downwardly-projecting housing is arranged between the standards F, which support the cylindrical casing, and is preferably of ornamental design, as illustrated.

The computing-cylinders are provided with charts of any desired construction. An indication is made through windows Y in the cylindrical casing of both the weight and the price, while the weight is further indicated through oppositely-arranged windows Y' on the other side of the casing. As shown in Fig. 12, the chart Y^2 is provided with circumferential rows of computations *q*, and in addition to the numerals which are printed in these rows each contains a series of markings *r*, which subdivide it to a common unit, such as one cent. These subdivisions illustrate the facility and accuracy with which the price indications may be read, which could not be attained if the numerals alone were depended upon, especially so with the computations of units of higher denomination.

What I claim as my invention is—

1. A scale comprising an indicating-cylinder, a draw-bar attachment for actuating the same, a cylindrical casing inclosing said cylinder, a removable plate forming the central portion thereof, and a weighing-spring and dash-pot normally inclosed within the circle of the cylindrical casing.

2. In a scale, the combination with a rotary indicator, a draw-bar for actuating the same, a weighing-spring for said draw-bar, an anchor for said spring, a dash-pot connecting said anchor and draw-bar, means for locking

the plunger in said dash-pot to form a rigid tie between the anchor and draw-bar, and a cylindrical casing inclosing said indicator, anchor and dash-pot.

3. In a scale, the combination with a rotary indicator, a draw-bar for actuating the same, a weighing-spring for resisting the movement of said draw-bar, an anchor for said spring, an oil dash-pot connecting said anchor and draw-bar, means for adjusting the resistance of said dash-pot, and means for locking the plunger in said dash-pot to form a rigid tie thereof.

4. A scale comprising an indicating-cylinder formed in spaced sections, mounted on a common shaft, a frame inclosing said cylinder, a cross-head on said frame between the sections of said cylinder, a weighing-spring and anchor on said cross-head, a draw-bar connected to said spring, and an actuating connection between said draw-bar and shaft, and a removable segmental plate in said frame, for the purpose described.

5. A scale comprising an indicating-cylinder formed in spaced sections, a frame inclosing said cylinder, a cross-head on said frame extending between said spaced sections of the cylinder, a draw-bar, a cross-head on said draw-bar, and weighing-springs, and an actuating connection for said cylinder, all connected to said cross-head on said draw-bar and arranged between said spaced sections of the cylinder, an oil dash-pot having its cylinder rigidly connected to said draw-bar cross-head, said springs and dash-pot being also connected to said cross-head on the frame.

6. A scale comprising an indicating-cylinder formed in spaced sections, a frame having adjustable bearings in its ends inclosing said cylinder and in which the latter is journaled, a cross-head on said frame extending between the sections of said cylinder, a draw-bar for actuating said cylinder, a cross-head on said draw-bar, and a pair of weighing-springs and dash-pots secured to said cross-head on the draw-bar and connected to said cross-bar on the frame.

7. A scale comprising a draw-bar, weighing-springs attached thereto, an anchor for said weighing-springs, a dash-pot connection between said anchor and draw-bar having its cylinder rigid with the draw-bar, and a locking connection between the plunger-stem and the dash-pot.

8. In a scale, a draw-bar and weighing-spring attached thereto, an anchor for said spring, a dash-pot connection between said draw-bar and anchor comprising a plunger and stem, a spherical head at the end of said stem, a socket in said anchor for receiving said spherical head, and a laterally-extending slot from said socket having an enlargement for permitting the passage of said head therethrough to disengage the same from said anchor.

9. A scale comprising a rotary indicating-cylinder formed in two spaced sections, a cylindrical casing within which said cylinder is journaled, a base, separated columns on said base for supporting the opposite end of said cylindrical casing a draw-bar between said columns and separate sections of the cylinder, a weighing-spring within said casing between the sections of the cylinder, and a removable central casing depending from said cylindrical casing for receiving the extension of said weighing-spring in the depressed position of said draw-bar.

10. In a scale, an indicating-cylinder formed in two spaced sections, and a frame in which said cylinder is journaled comprising end heads, intermediate heads between the sections of the cylinder, connecting longitudinal bars and a cross-head between said intermediate heads, forming an anchor for the weighing-spring.

11. In a scale, the combination with a shaft, a pair of indicating-cylinders mounted upon said shaft and spaced from each other, a frame comprising a plurality of circular heads and longitudinal connecting-bars and adjustable plugs in the end heads of said frame-carrying bearings for said shaft.

12. In a scale, the combination with a rotary indicating-cylinder, of a cylindrical casing inclosing said cylinder, a draw-bar having an actuating engagement with said rotary indicator at the center thereof and weighing-springs connected to said draw-bar, and a segmental blade forming the central portion of said inclosing casing and removable for access to said draw-bar and spring.

13. A scale comprising a rotary indicator, a skeleton framework surrounding said indicator, a cylindrical casing formed in separated sections secured to said framework, a weighing-spring and a draw-bar connection arranged between said sections of the casing, and a central inclosing casing formed of removable segments.

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

CHARLES G. STRUBLER.

Witnesses:

JAS. P. BARRY,

AMELIA WILLIAMS.