

(No Model.)

2 Sheets—Sheet 1.

L. WOMMER, Dec'd.
A. L. E. WOMMER, Administratrix.
AUTOMATIC WEIGHING SCALE.

No. 512,082.

Patented Jan. 2, 1894.

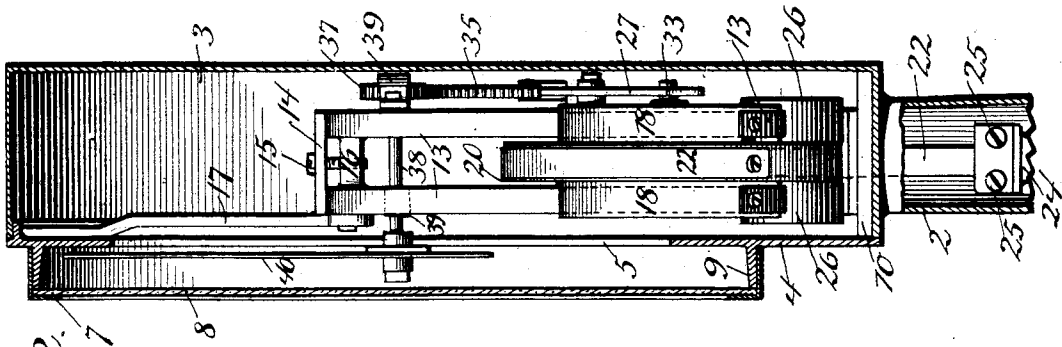


Fig. 2.

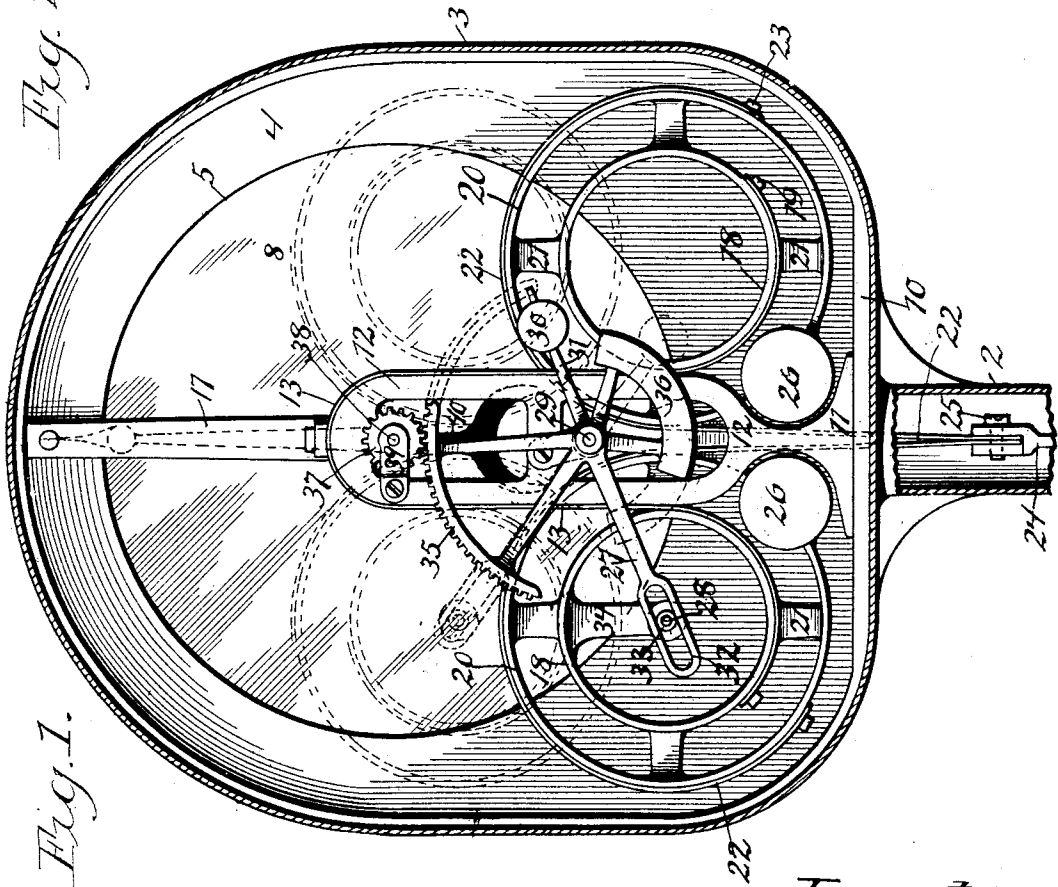


Fig. 1.

Witnesses.

J. Jensen.

O. H. Hawley.

Inventor
Louis Wommer.

By Paul & Merriam attys.

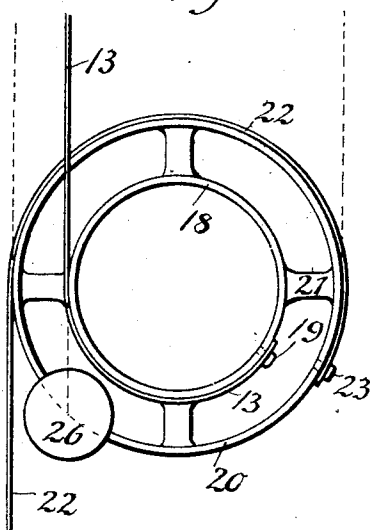
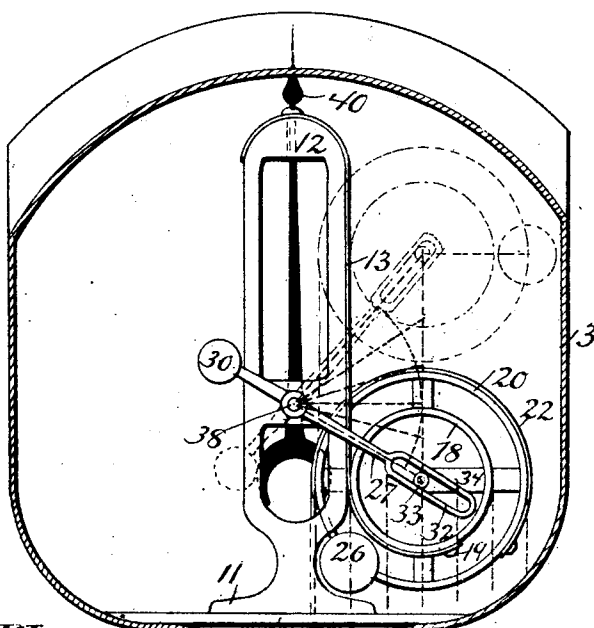
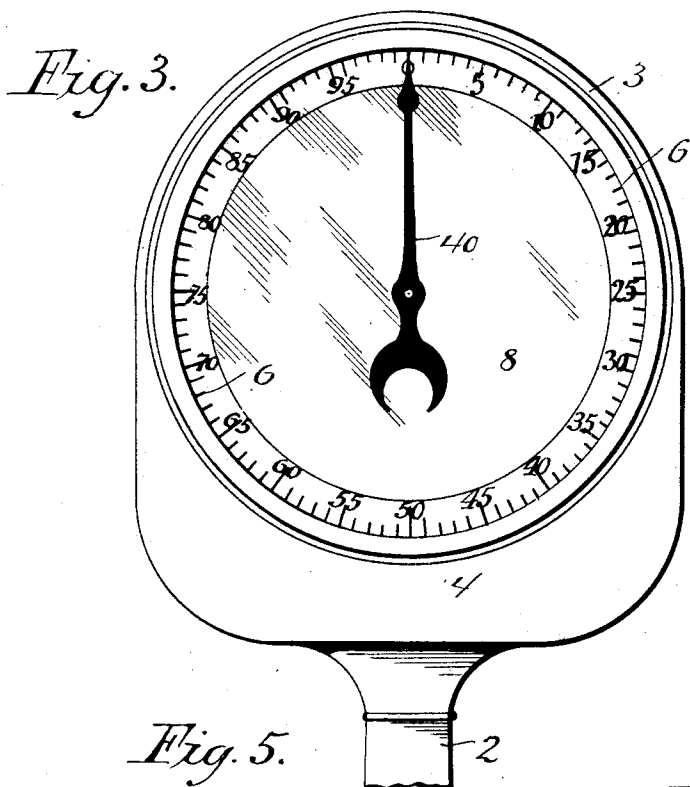
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

LOUIS WOMMER, OF MINNEAPOLIS, MINNESOTA; ANNA L. E. WOMMER
ADMINISTRATRIX OF SAID LOUIS WOMMER, DECEASED.

AUTOMATIC WEIGHING-SCALE.

SPECIFICATION forming part of Letters Patent No. 512,082, dated January 2, 1894.

Application filed May 20, 1892. Serial No. 433,764. (No model.)

To all whom it may concern:

Be it known that I, LOUIS WOMMER, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain Improvements in Automatic Weighing - Scales, of which the following is a specification.

The invention relates to improvements in automatic weighing scales and particularly to the indicator of the scale, and the object of the invention is to provide such a mechanism as will respond quickly to the slightest weight applied or change therein which will be of a very simple and economical construction and which may be employed with a dial having equal graduations.

To this end my invention consists in the combination with the draw rod and the indicating means, of a differential mechanism interposed between the same; in the weighted rings and straps composing said differential mechanism; in a duplicate arrangement thereof, and in a particular indicating mechanism, all as hereinafter described and particularly pointed out in the claims.

My invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is an elevation of an automatic scale mechanism embodying my invention, the back of the case being removed. Fig. 2 is a side elevation of the same showing the case in section. Fig. 3 is a front view of my scale. Fig. 4 is a detail view of the differential rings and the flexible straps thereof. Fig. 5 shows a modified construction.

As shown in the drawings, 2 represents the hollow post or standard of the scale and 3 the inclosing case having the shape to conform to the interior mechanism of the device. The upper part of the case has the semi-circular form as shown and in the forward wall 4 thereof is a large annular opening 5 around which are the dial graduations 6. The cap 7 having the glass face 8 is adapted to be secured on the annular rib on the wall 4 and is concentric with the dial. The lower part of the case has the base 10 upon which rest the feet 11 of the upright guides 12, the upper ends of which are rounded as shown to receive the flexible straps 13 which straps loop over the heads thereof and are fastened in place by the yoke strap 14, which in turn is secured by the screw 15 passing into the

brace 16 integral with the guide castings and from which the brace or arm 17 extends to the upper part of the case. The sides or edge surfaces of the parts 12 are exactly parallel and vertical. The straps extend down these edges and their ends pass around beneath the lower sides of the smaller rings 18 of the two pairs of differential rings. The ends of the straps are fastened thereon by screws or other suitable means 19.

Integral with or secured to each of the wide rings 18 is a larger ring 20 connected therewith by a web or spokes 21. This large ring stands midway between the ends of the smaller one as shown plainly in Fig. 2, and the two large rings project between the two guides. On each of the large wheels is wound a flexible strap 22 having its outer end secured on the outside of the large ring by a screw 23 or other suitable means and the straps of the two rings pass down between the guides and through the bottom of the case into the post 2 where they are fastened in the upper end of the draw rod 24 by the clamping screw 25. Two circular weights 26 are fastened upon or formed integrally with the rings 20 and when the scale is at the normal these weights stand in the position shown in Fig. 1, the lower ends of the guides being recessed or notched to permit the weights to return to such positions. Now it will be seen that when the rod 24 is pulled down by the application of the weight thereto that the revolution of the large rings caused by the unwinding of the straps 22 therefrom will operate to move the smaller rings up along their guiding and suspending straps 13. This movement causes the weights 26 to travel horizontally outward and upward to increase their leverage measured on a horizontal line with respect to the points of bearing between the small rings and their straps. This increase is in proportion to the increased force applied on the draw rod, the weights moving out certain distances for given increments of weight. It is therefore necessary only to measure the travel of the weights in order to determine the force exerted on the draw rod. This I accomplish by means of the pivoted arm 27 and the center pin 28 shown most clearly in Fig. 1. The arm 27 is secured upon the short shafts 29 having bearings on the guides 12, the bearings being on the outside thereof. The arm is balanced by the

small counter weight 30 provided on the extension 31 thereof and upon the outer end of the arm is the long straight slot 32 into which the pin 28 and the small steel friction roller 33 projects. The pin is secured upon the arm or spoke 34 of the small ring 19 and is concentric therewith. The vertical movement of the differential rings is not in direct proportion to the various weights but when measured in the arc of a circle by means of the radial arm 27 the vertical movement is transmitted through the shaft 29 to cause the same to rotate equal distances for equal increments. This movement may be rendered visible by a pointer secured directly on the shaft and operating over a segmental dial like that shown in Fig. 5, or in place of the same I may substitute the indicating mechanism shown in Figs. 1 and 2 and by means of which I am enabled to use a circular dial. As shown a quadrant gear or rack 35 is arranged upon the shaft 29 to move with the arm 27. This quadrant is balanced by the quadrant weight 36 depending from the lower side of the arm and the rack meshes with the pinion 37 secured upon the pointer shaft 38 having bearings 39. On the shaft is the balance pointer 40 adapted to move over the dial. One of the principal advantages of this construction is that a large pinion 37 may be employed, thereby reducing friction and fluctuation to a minimum and rendering the scale extremely sensitive and accurate.

It is obvious that but one pair of differential rings need be employed. In fact such a construction is particularly adapted for scales upon which it is desired to weigh light articles. For heavy work, however, I prefer to divide the counterbalancing weights 26 equally between two pairs of weighing rings rather than to employ one large weight upon a single pair.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination in an automatic weighing scale, of differential rings arranged to move together, a strap or straps wound upon one of the same and passing upward, a guide whereon the same is secured, a strap upon the other ring passing downward over the inner side thereof, the draw rod attached to the said strap, and indicating means provided in connection with said rings, substantially as described.

2. The combination with differential rings, of a supporting strap or straps wound upon one of them, a guide, a strap wound upon the other ring and passing down over the inner side thereof, a draw rod connected therewith, a pin centrally arranged on said rings, a pivoted arm having its free end to engage said pin, a pointer arranged in connection with the pivoted end of said arm, and a dial, substantially as described.

3. The combination with concentric rings adapted to move together, of a vertical guide

with which one of the rings engages, a strap fixed to said guide at its upper end, and having its lower end extending around the under side of said ring, a flexible strap arranged upon the other ring, and extending down over the inner side thereof, a draw rod connected therewith, a weight arranged on said ring, a central pin provided on the ring a pivoted arm having a slotted end to engage said pin, a quadrant rack provided on the pivoted end of said arm, a pinion to engage the same, a pointer in connection with said pinion and a dial all substantially as described.

4. The combination with two pairs of weighted differential rings and the straps wound thereon in opposite directions, of the vertical guide arranged between the pairs a central pin on one of said pairs, a radial arm, the shaft whereon the same is secured, said arm having a slot to contain said pin, and an indicating mechanism in connection with said arm, substantially as described.

5. The combination with the vertical guide, having the notched lower end, of the two pairs of differential rings 18 and 20, each provided with a weight 26, the strap or straps 13 extending over the top of said guide and secured thereon, the lower ends of said straps extending around the rings 18 and secured thereon, the straps 22 provided on the rings 20, the draw bar whereto the lower ends of said straps are connected, the central pin 28, the radial arm 27 provided with the straight slotted end to engage said pin, a quadrant arranged on said arm, a counterbalance for both, a pinion, a pointer connected therewith, and a dial, substantially as described.

6. The combination in an automatic weighing scale of the standard, with the case arranged thereon, the two part standard arranged within said case and having the vertical guide edges, the rings 18 and 20, the straps 13 and 22 thereof, said ring 18 operating on said guide edges, the weights 26, a central pin, the slotted arm 27, the shaft 29 thereof, the counterbalance for the arm, the quadrant rack concentric with said shaft, the pinion and pinion shaft, the pointer arranged thereon, and the dial, substantially as described.

7. The combination with the standard or post, of the case arranged thereon and having the semicircular upper part, the rim 9 arranged on the face of the case, the cap to be secured thereon, the dial, the differential rings the flexible straps thereof, the vertical guide, the indicating mechanism connected with said rings, the lower part of the case having a shape to conform to the differential rings when in their normal positions, substantially as described.

In testimony whereof I have hereunto set my hand this 20th day of April, 1892.

LOUIS WOMMER.

In presence of—

A. C. PAUL,
F. S. LYON.