(No Model.) 2 Sheets—Sheet 1.

N. G. ROSS.

GRAIN SCALES.

No. 433,422. Patented July 29, 1890.

Fig. 1.

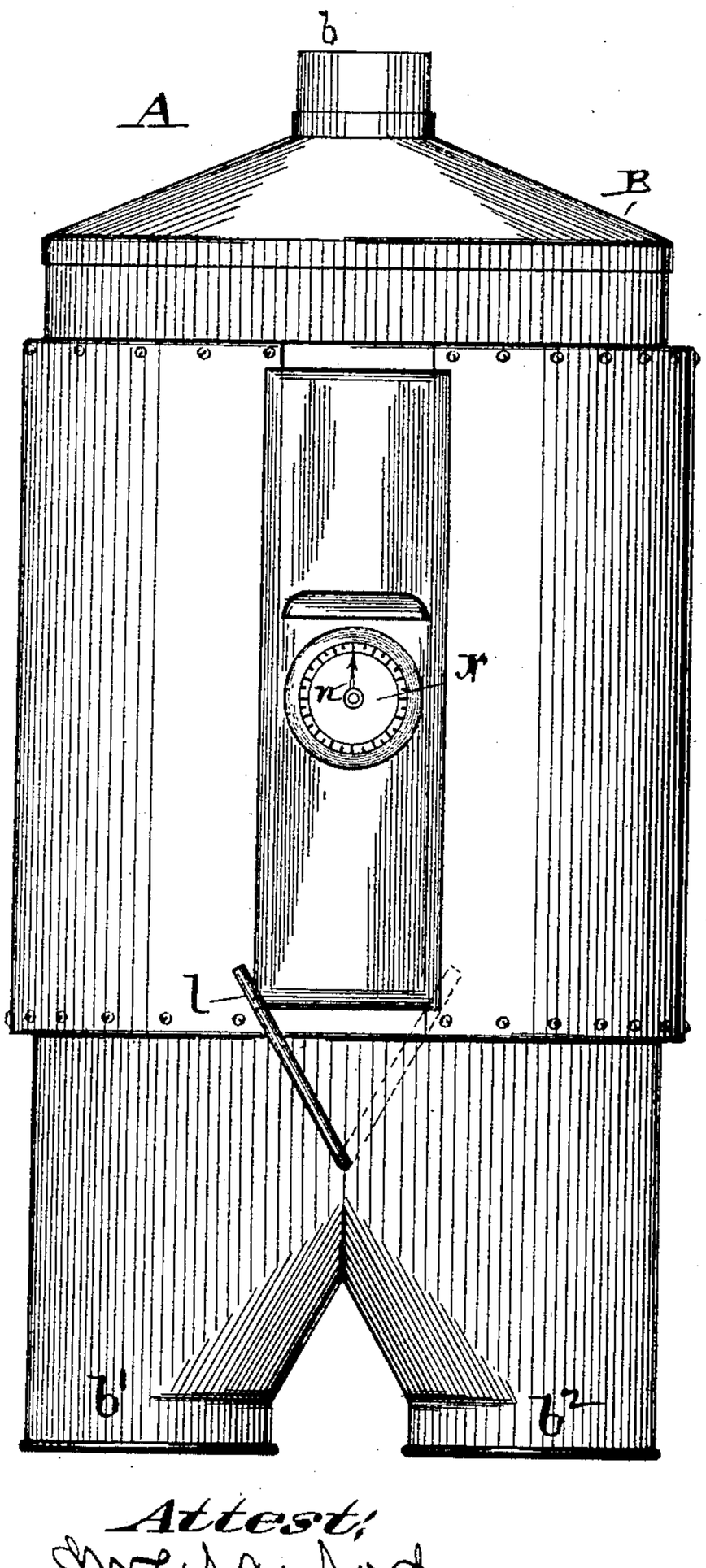
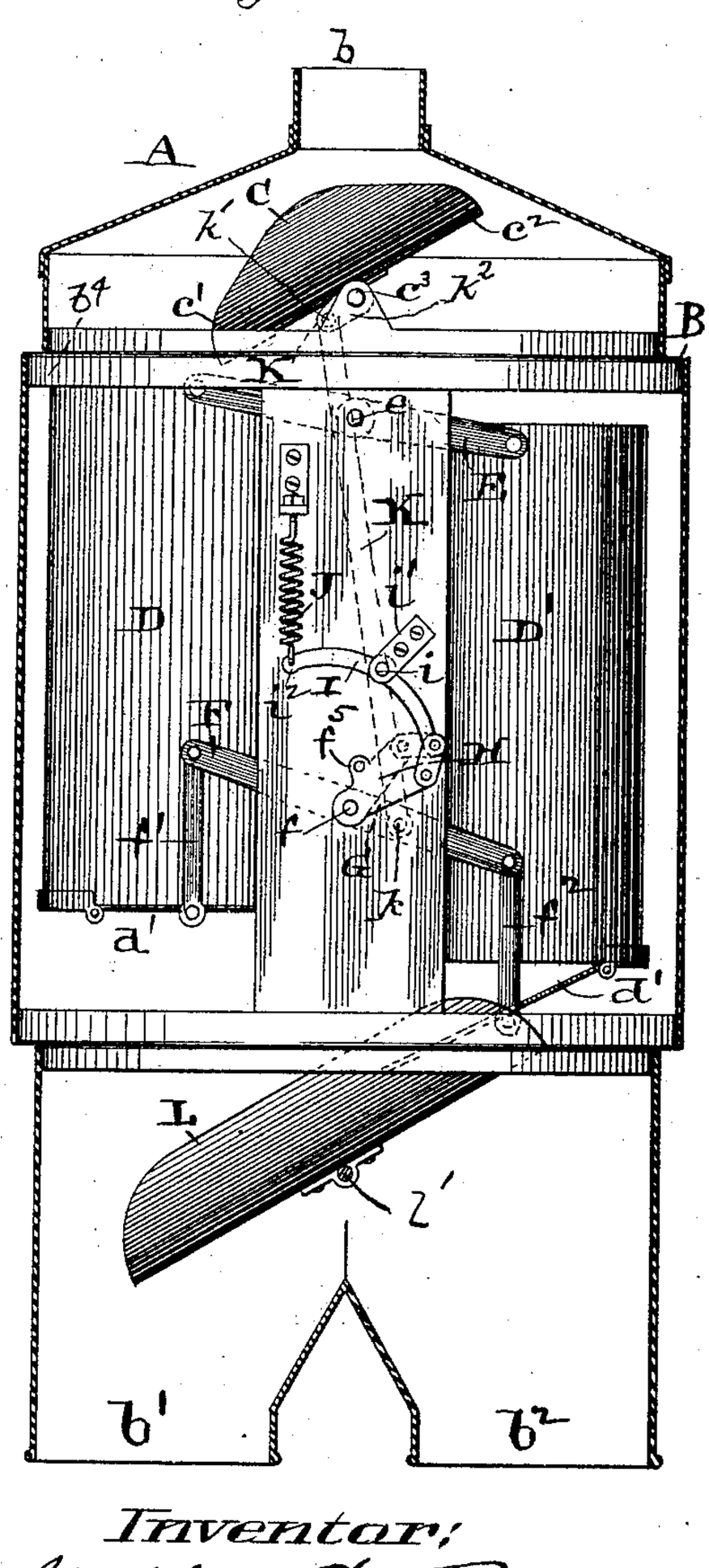


Fig. 2.



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Atty

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

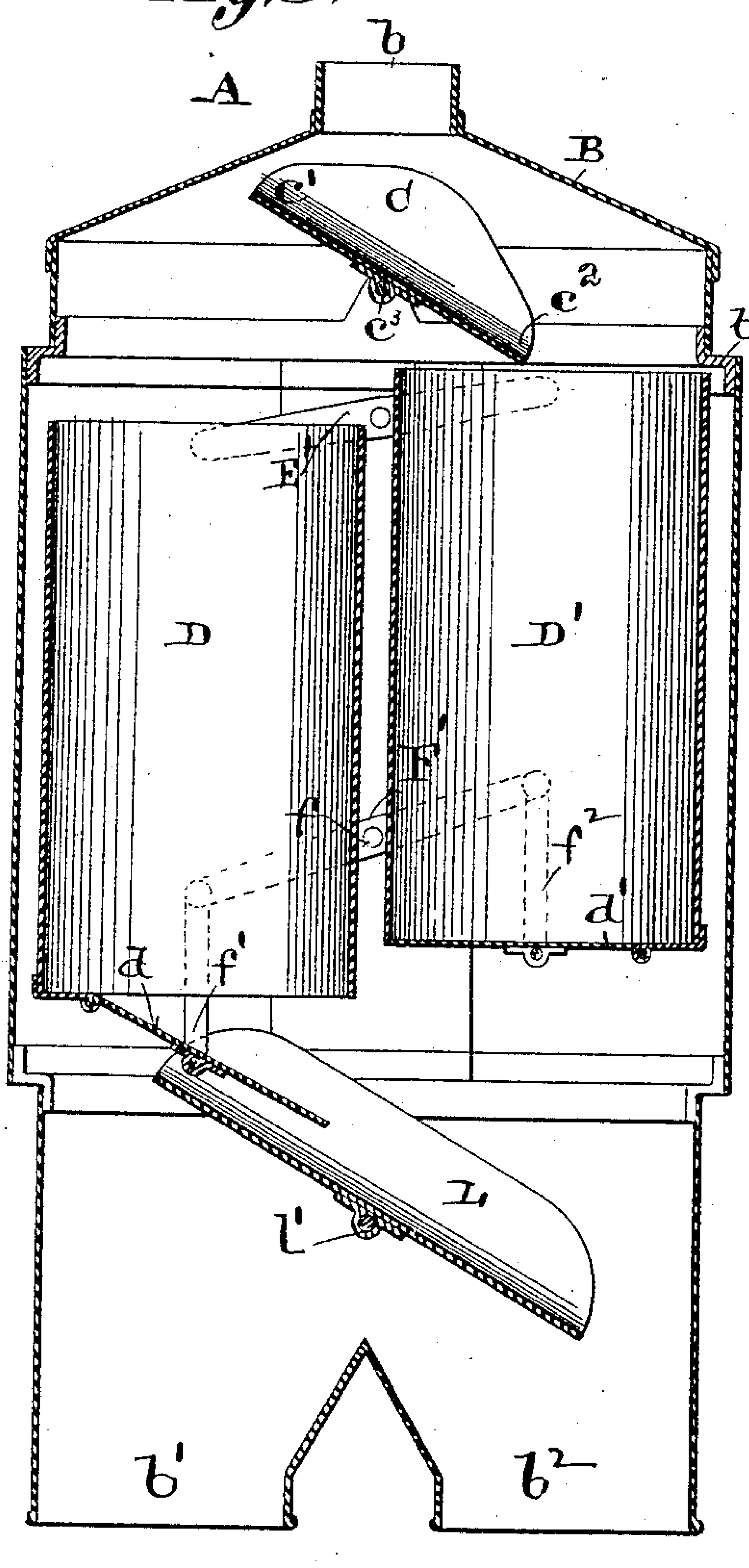


Fig. 4.

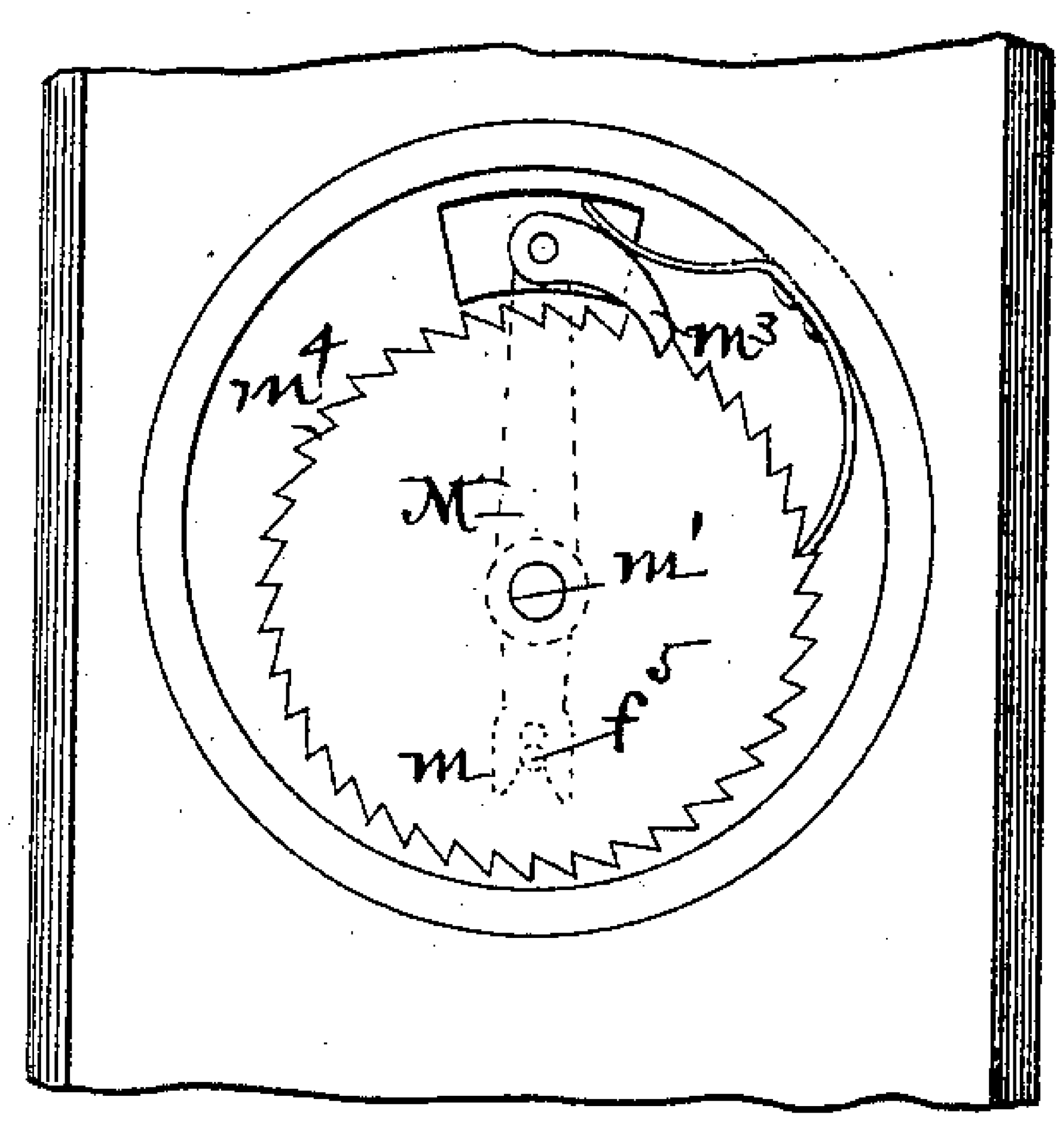
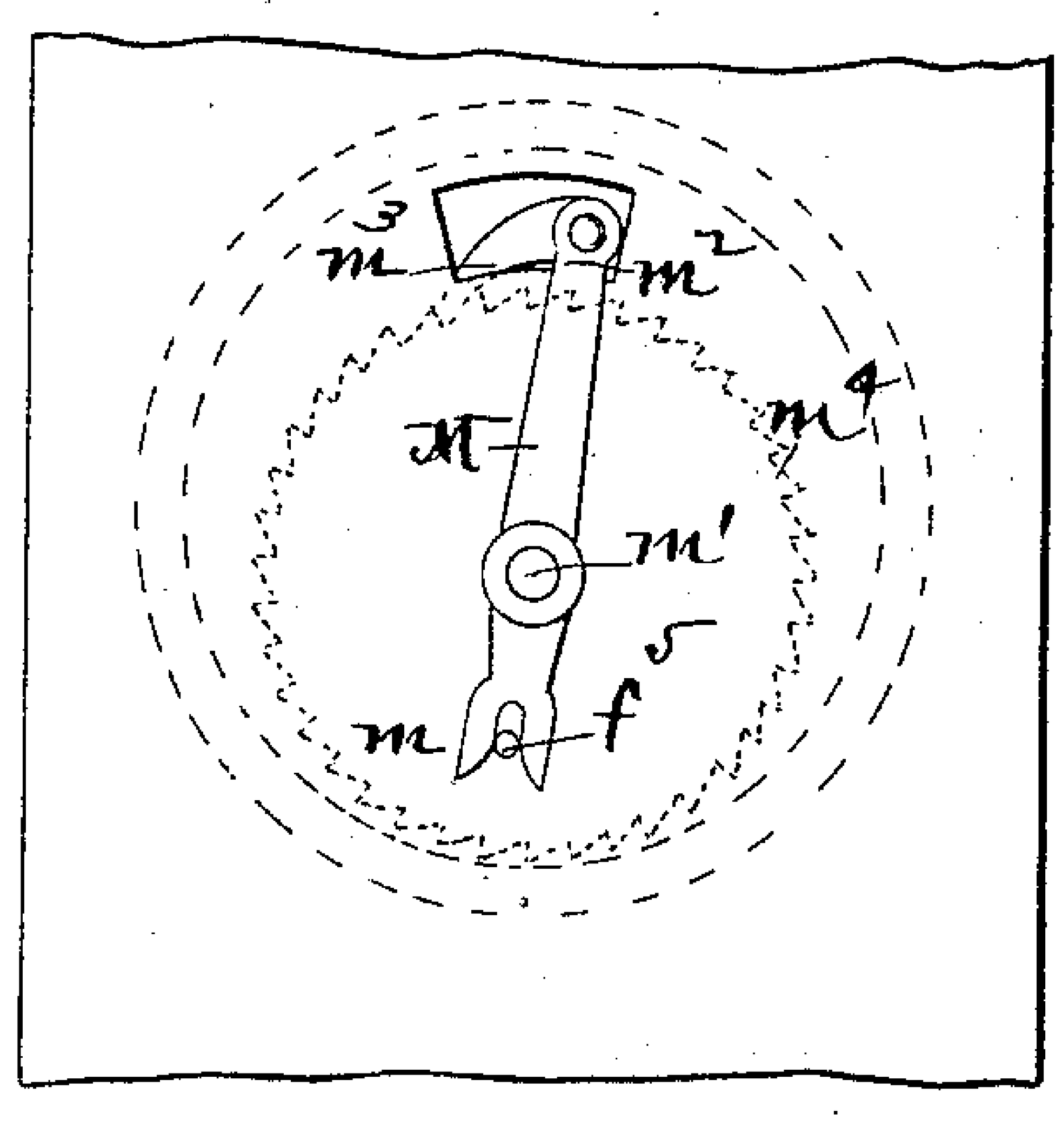


Fig. 5.



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UNITED STATES PATENT OFFICE.

NOBLE G. ROSS, OF CENTRE, ASSIGNOR TO THE CYCLONE MANUFACTURING COMPANY, OF NEW LONDON, MISSOURI.

GRAIN-SCALE.

SPECIFICATION forming part of Letters Patent No. 433,422, dated July 29, 1890.

Application filed January 31, 1890. Serial No. 338,778. (No model.)

To all whom it may concern:

Be it known that I, NOBLE G. ROSS, of Centre, Ralls county, Missouri, have made a new and useful Improvement in Grain-Meters, of which the following is a full, clear, and exact description.

The improvement relates to that class of grain-scales in which the grain to be weighed is fed into two compartments alternately, which when filled alternately drop and discharge their contents and then rise to be refilled, the movement being occasioned by the weight and movement of the grain.

The improvement consists, partly, in the special means employed in delivering the grain into the compartments of the scale and discharging it therefrom, and partly in the special means for controlling the flow of the grain after it has been weighed, whereby it can be readily collected in receptacles of a certain size, substantially as is hereinafter set forth and claimed, aided by the annexed drawings, making part of this specification, in which—

Figure 1 is a front elevation of the improved scale; Fig. 2, a view showing the scale-case mainly in central vertical section and the interior parts in side elevation; Fig. 3, a vertical central section of the scale, showing the movable parts in a different position to that of Fig. 2; Fig. 4, a detail, upon an enlarged scale, showing the means for operating the scale-register; and Fig. 5, a view of the parts of Fig. 4 looking at the opposite side thereof.

The same letters of reference denote the same parts.

A, Figs. 1, 2, and 3, represents a desirable form of the scale under consideration. It is desirable to inclose its working parts within a case B, having an inlet *b*, through which the grain enters the scale, and outlets *b'* *b*² through which the grain leaves the scale. This case constitutes a suitable frame for the movable parts of the construction. The grain entering through the inlet *b* drops into a tilting chute C, Figs. 2 and 3, which is pivoted at *c* to a fixed bearing, whereby the chute can be tilted, so that the grain received in the chute can be discharged first from one end *c'* and then from the opposite end *c*² thereof, as indicated by the two positions shown, respectively, in Figs. 2 and 3. The chute may be of any shape suitable for receiving the grain and directing it to the weighing compartments D D′ alternately. The compartments D D′ are open at the upper end thereof to admit the grain coming from the chute, and at the lower end thereof are respectively provided with bottoms *d d'*, which can be opened to discharge the grain, and the compartments are equal in weight and of sufficient capacity to each hold a certain measure—say one-half of a bushel—of the grain. The compartments are, by means of the arms E E′, supported and balanced so that they can alternately rise and fall, as indicated by their positions, (shown, respectively, in Figs. 2 and 3,) the arms being journaled at *e* in the scale-frame and at their ends being jointed to the compartments.

F F′ represent another pair of arms journaled centrally at *f* to the scale-frame, and at their ends connected with the compartment bottoms *d d'*—that is, the arms at one end thereof—and by means of links *f'* are jointed to the bottom *d*, and at the opposite end thereof, and by means of links *f*², are jointed to the bottom *d'*. The arm F has rigidly attached to it an arm G, Fig. 2, which in turn, and by means of the link H, is jointed to a lever I. This last named part is pivoted at *i* to a bearing *i'*, and at its end *i*² is jointed to a spring J, which in turn is attached to the scale-frame, substantially as shown. The arm G and link H form a toggle-like construction, having a movement indicated by the full and broken lines, Fig. 2.

K represents a rod jointed at *k* to the arm F, and at *k'* to a crank *k*², which is fastened to the same shaft *c*³ to which the chute C is fastened. The connection of the rod K is such that when that end of the arm F to which the rod is attached is depressed the opposite end *c'* of the chute is depressed, substantially as shown.

The operation of the scale as thus far described is as follows: Suppose the chute is in

the position of Fig. 2, the grain is delivered from the chute into the compartment D, and it continues to flow into it until the desired measure has been received therein. The compartment D now drops and the compartment D′ rises a certain distance, say one inch, until the further movement of the compartments is prevented by some suitable stop. In the present instance the limiting of the movement is accomplished by having the rising compartment encounter the shoulder b^4. The described movement of the compartments causes the arms F F′ to turn on their pivot *f*. This in turn, and by means of the rod K, causes the chute C to be tilted in the opposite direction—that is, toward the position shown in Fig. 3. The chute, however, as yet has been tilted only far enough to cut off the delivery of the grain into the compartment D, and not far enough to direct the grain into the opposite compartment D′, and up to this point of time the bottom *d* of the compartment D remains closed. The weight of the contents of the compartment D, however, is still pressing upon the bottom *d*, and as soon as the downward movement of the compartment D ceases, its bottom *d* opens, and the bottom *d′* of the compartment D′, owing to the described connection of the bottoms, closes, substantially as shown in Fig. 3. The contents of the compartment D are now discharged therefrom, and the grain is delivered into the compartment D′. For, owing to the opening of the door *d*, the arm F is turned still farther on its pivot—that is, into the position of Fig. 3—and the rod K, in consequence, is pushed still farther upward, and the chute in turn is tilted still farther and ultimately into its position shown substantially in Fig. 3. The grain now continues to be delivered into the compartment D′ until the desired measure has been received thereinto, whereupon that compartment D′ drops and the opposite compartment D rises until its upper end encounters the shoulder b^4. The chute is tilted toward its original position, the bottom *d′* then opened and the bottom *d* closed, and, ultimately, all the movable parts described assume the position of Fig. 2. The grain is again delivered into the compartment D and the operation repeated, and so on, first into and through one of the compartments and then into and through the other of the compartments. As the arm F is turned from its position of Fig. 2 into its position of Fig. 3, the toggle G H shifts from its position (shown in the full lines Fig. 2) into its position indicated by the broken lines Fig. 2, and as the arm F is turned back again into its position of Fig. 2, the toggle is shifted into its original position. As the toggle is straightened the lever I is necessarily turned on its pivot and the spring J thereby stretched, and as soon as the toggle is shifted past its straight position the spring acts to draw the lever I into its original position. The spring J can be and is adjusted to suit any desired resistance—that is, any desired weight of grain in the compartment—and whenever that weight is delivered into a compartment the spring yields and the toggle and parts therewith connected are permitted to act in the manner described. The mode of adjusting the spring is not shown, as such mode is well understood.

The grain delivered from the compartments D D′ may be conducted by any desirable means to any desired point. The scale, however, is rendered more complete by the addition of the following feature:

L, Figs. 2 and 3, represents a trough-like chute adapted to be tilted, say, by means of the crank *l*, Fig. 1, upon the bearing *l′*, and to and from its positions, shown, respectively, in Figs. 2 and 3. This chute is adapted to receive the grain from either compartment and deliver it into the opposite outlet *b′* or b^2, as the case may be, from the case B. These outlets are made in the form of legs, substantially as shown, to which bags may be alternately attached. Suppose the compartments D D′ are each adapted to measure one-half of a bushel at a time, a bag (not shown) capable of holding, say, two bushels, or several times the measure of a compartment, is attached to one of the legs *b′* b^2. The grain from both of the compartments D D′ is, by means of the chute L, directed into that bag. As it requires several movements or weighings of the scale before the bag is filled, opportunity is afforded meanwhile for another bag (not shown) to be similarly applied to the other of the legs *b′* b^2. When the first named bag is filled the attendant can, and does, at once, and by means of the crank *l*, shift the chute L to direct the grain from the compartments into the second named bag, and so on, while one bag is being filled another bag is being placed in readiness, and the chute L is shifted to and fro, as and for the purpose described.

The movements of the compartments may be registered, to which end the arm G is provided with a pin f^5, Figs. 2, 4, and 5, which projects and engages in the slotted end *m* of a lever M, which is pivoted at *m′* to a fixed bearing upon the scale-frame, and whose end m^2 is provided with a pawl m^3. This pawl coacts with a ratchet m^4, which forms part of a register N, Fig. 1, whose hand *n* is thereby moved and caused to register in the ordinary way.

The register works are not exhibited in detail, as such constructions are familiar.

I desire not to be restricted to any particular mode of jointing the arms F and the compartment bottoms to each other. Such jointed connection may be more direct than is the one shown.

I claim—

1. In a grain-meter, the combination, with the balanced vertically-moving compartments D D′, and the centrally-pivoted arms E E′, having their ends pivoted to the sides of the corresponding compartments near the tops

thereof, of the bottoms d d', hinged at the outer parts of their edges, the centrally-pivoted arms F F', and the links f' f^2, respectively, connecting opposite ends of said arms F F' with the hinged bottoms d d', substantially as specified.

2. In a grain-meter, the combination, with the balanced vertically-moving compartments D D', and the centrally-pivoted arms E E', having their ends pivoted to the sides of the corresponding compartments near the tops thereof, of the bottoms hinged at the outer parts of their edges, the centrally-pivoted arms F F', the links connecting opposite ends of the arms F F' with corresponding hinged bottoms, the tilting chute C, the crank-arm k^2, projecting to one side, and the rod K, connecting said crank-arm and the arm F or F' in such manner that as one compartment rises and its bottom closes the chute will be tilted downward toward said compartment, substantially as specified.

3. In a grain-meter, the combination, with the casing B, having the circumferential shoulder b^4, and the vertically-moving compartments D D', pivoted near their tops to the corresponding ends of the centrally-pivoted arms E E', and having their upward motion alternately stopped by said stop b^4 of the tilting chute C, the crank k^2, the hinged bottoms d d', the pivoted arms F F', links f' f^2, and connecting-rod K, by means of which arms E E', links, and connecting-rods the weight of the grain can open the bottoms after the compartments have been brought to rest, substantially as specified.

4. In a grain-meter, the combination, with the balanced vertically-movable compartments and the hinged bottoms thereof, of the centrally-pivoted arms F F', the links f' f^2, connecting said arms with the hinged bottoms, the arm G, standing centrally from the arm F, the centrally-pivoted lever I, the link H, connecting the lower end of said lever and the arm G, and the coiled spring J, having its upper end attached to the frame of the meter and its lower end attached to the upper end of the lever I, substantially as specified.

Witness my hand this 20th day of August, 1889.

NOBLE G. ROSS.

Witnesses:
C. D. MOODY,
D. W. C. SANFORD.