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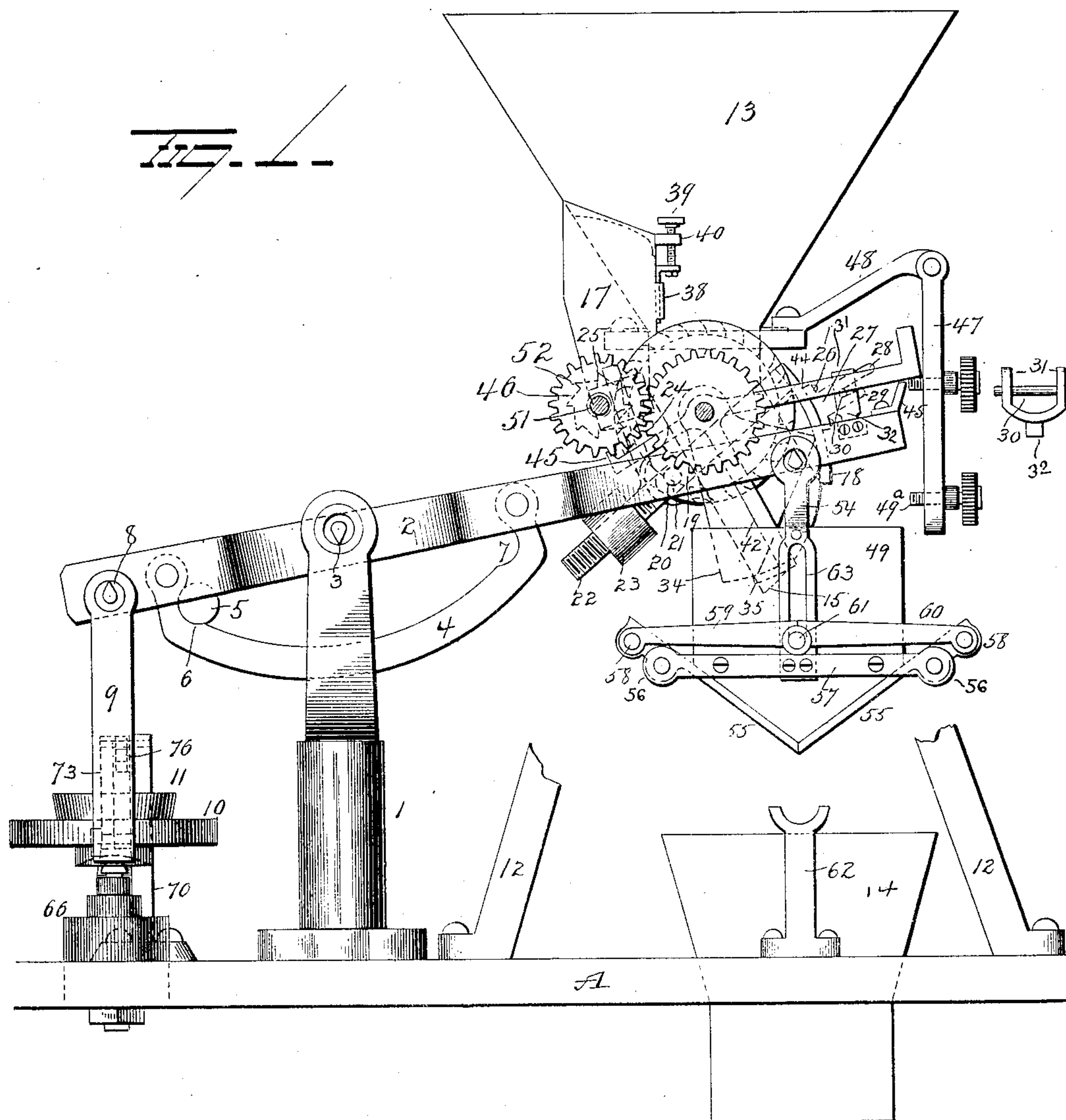
Patented Sept. 11, 1900.

C. F. WOOD.
WEIGHING MACHINE.

(Application filed July 1, 1898.)

(No Model.)

3 Sheets—Sheet 1.



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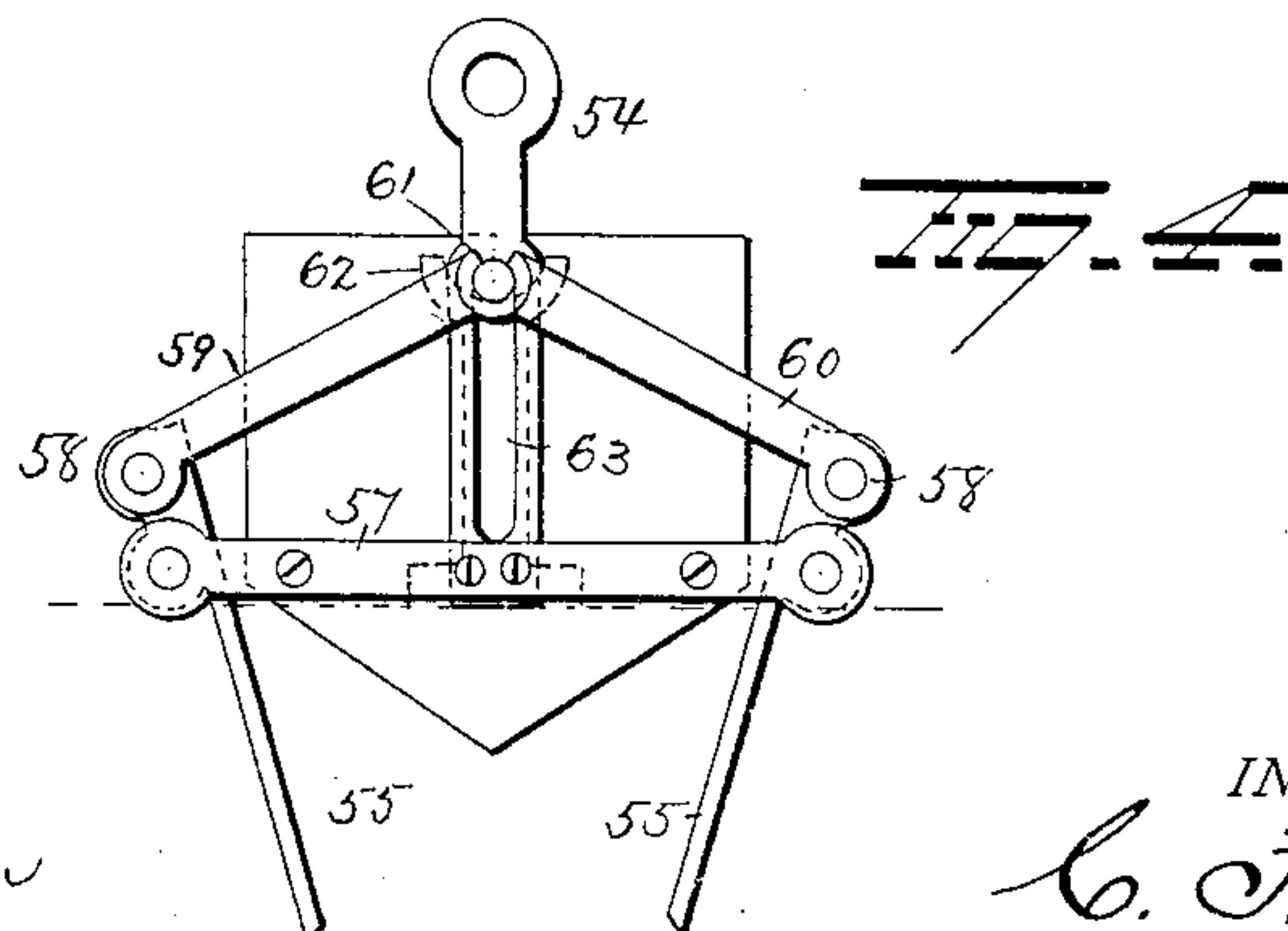
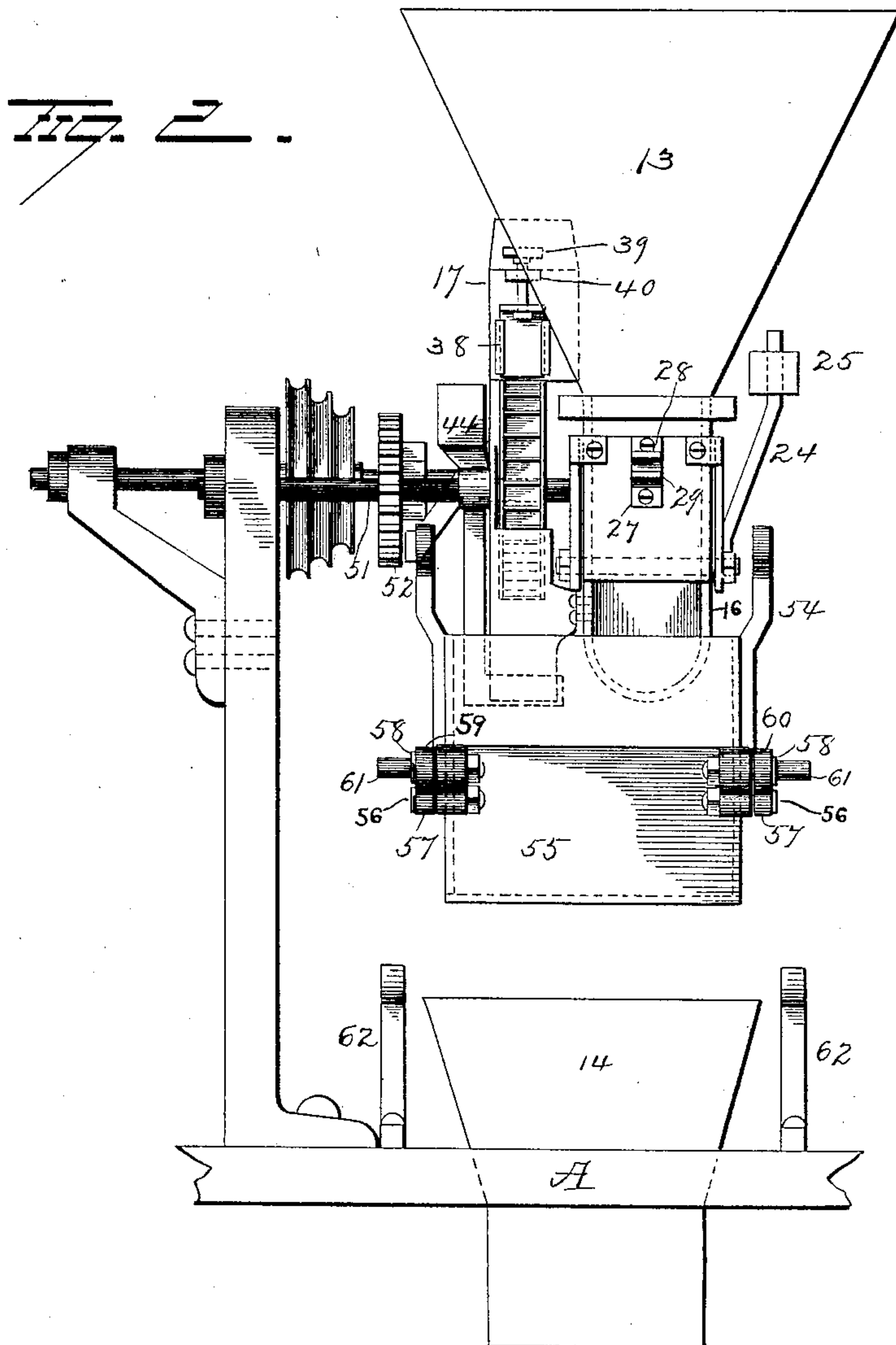
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3 Sheets—Sheet 2.



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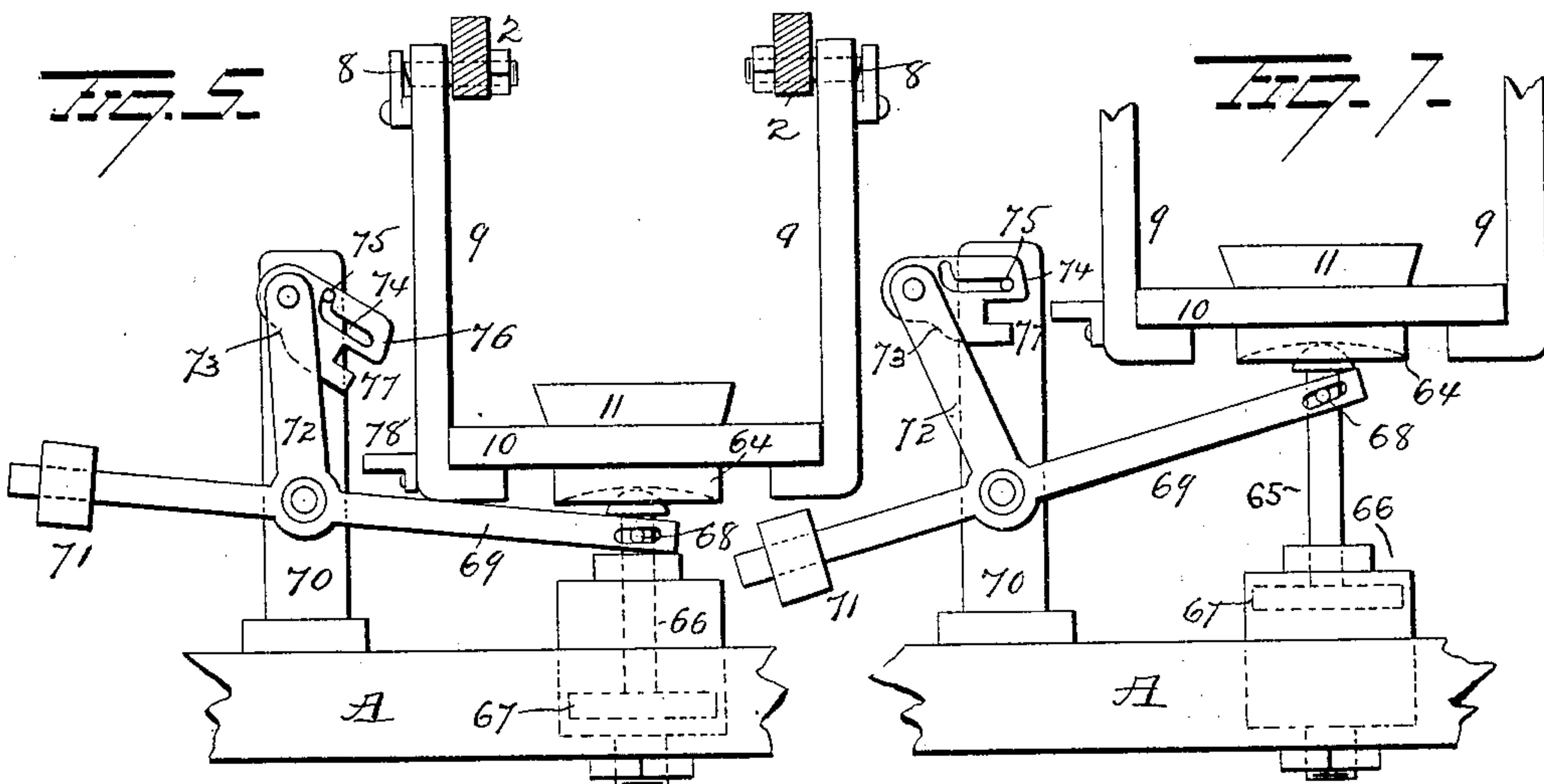
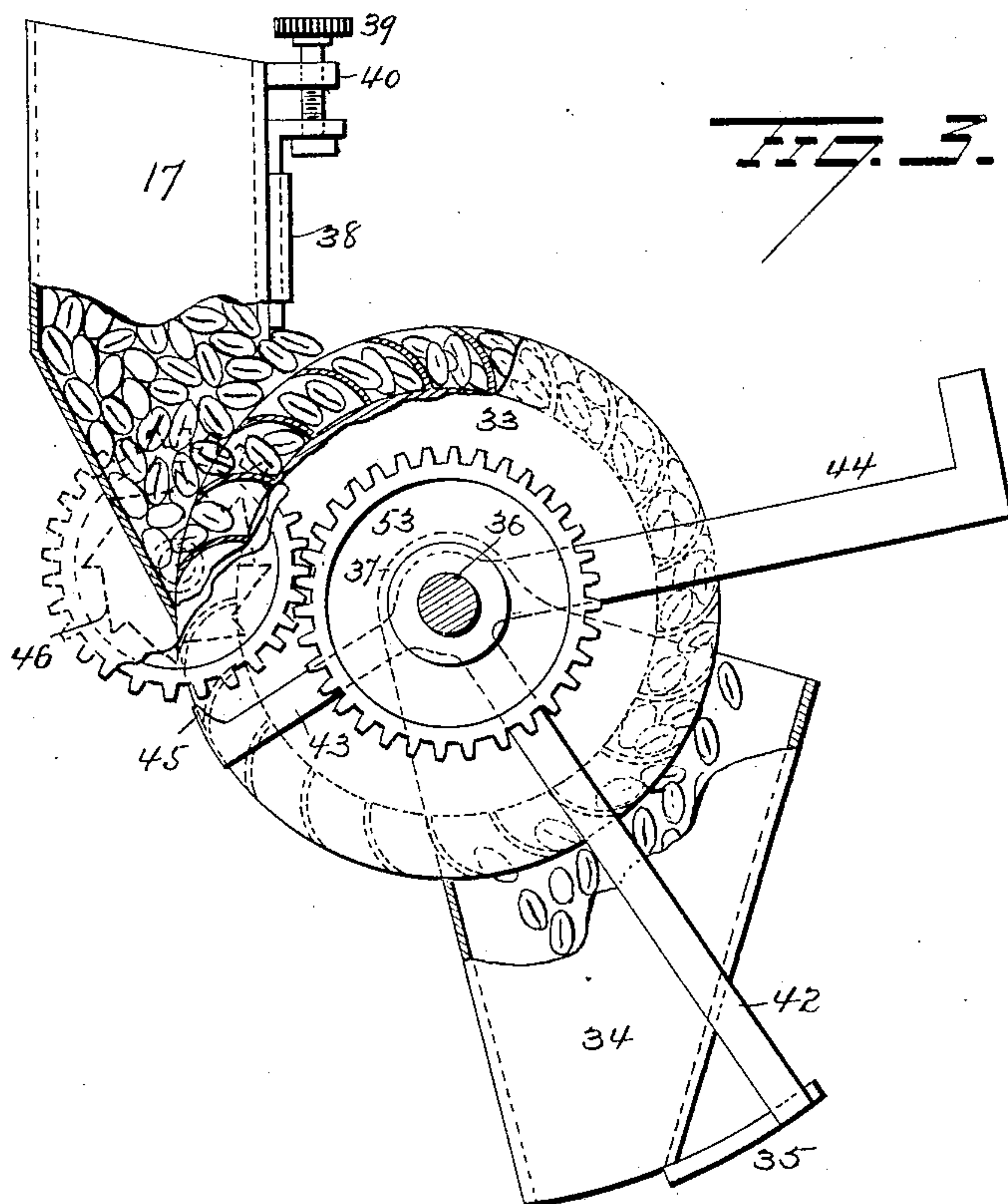
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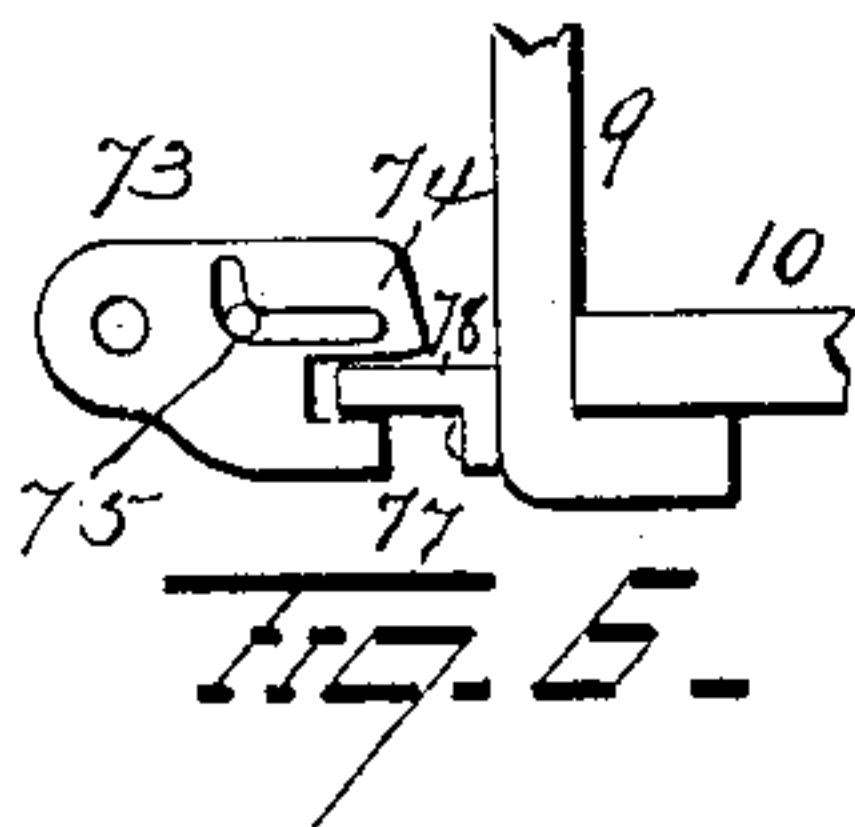
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

CHARLES F. WOOD, OF RICHMOND, VIRGINIA.

WEIGHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 657,721, dated September 11, 1900.

Application filed July 1, 1898. Serial No. 684,959. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. WOOD, a resident of Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Weighing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in weighing-machines, one object of the invention being to provide a device that will be comparatively simple in construction, one that will be automatic in its action, and one that will be most effectual in use.

A further object is to provide a device that will automatically weigh out a predetermined amount of coffee, sugar, grain, and the like and which may be regulated to weigh out any amount desired.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as will be more fully hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side view of my machine. Fig. 2 is an end view, and Figs. 3, 4, 5, 6, and 7 are views of details.

A represents a base on which standards 1 are disposed. A double scale-beam 2 is pivotally mounted on said standards 1 by means of knife-edge bearings 3, as shown, and is provided with downwardly-extending curved guideways 4, which carry a roller, ball, or weight 5. The guideways are disposed between said uprights and adapted to permit the ball to travel from one end to the other. At each end of said guideways indentations or recesses 6 7 are provided, whereby to arrest the motion of the ball and permit the same to rest therein. The ball is adapted to act as a cut-off for the auxiliary feed mechanism and to give a momentum to the action of the scale and permit the discharge of the bucket 49, which will be more fully hereinafter described. Pivotaly connected, by means of knife-edge bearings 8, to one end of the scale-beam 2 are depending arms 9, which have disposed at their lower ends a pan or receptacle 10 to receive weights 11, according

to the amount of material to be weighed. Supports 12 are secured at their lower ends to the base A and support at their upper ends the main hopper 13. A funnel 14 is secured in said base A between the supports 12 for the hopper 13 and is disposed directly below the mouth 15 of said hopper.

The hopper 13 is provided with a main spout 16 and an auxiliary spout 17, as shown. The spout 16 extends preferably obliquely downward, and its lower end is curved, as shown, to permit the gate 18 to more effectually cut off the supply of material. The gate 18 is carried by two arms 19, pivoted on a shaft 20 in a bracket 21, secured to the spout 16. The arms 19 are braced together at their inner ends, and to this brace a screw-threaded arm 22 is secured and adapted to receive thereon the counterbalance-weighted nut 23. On one of said arms 19 is secured an upright arm 24, which also carries a counterweight 25, as shown. The object of counterweight 25 is to detain the gate open a longer time than would ordinarily be the case with an ordinary counterweight, as it will be readily seen that the counterweight 25 will pass from one side of a perpendicular line to the other. Thus it exerts more influence on the gate in the upper position and helps to keep it open. When, however, the gate is nearly closed, it acts in an opposite direction, causing the gate to close more quickly. On the other face of gate 18 is secured, by means of screws or bolts 26, a bifurcated arm 27, the upper arm or member 28 being preferably longer than the lower arm 29. This arm 27 is adapted to be engaged by a pin 30, carried between two parallel arms 31 of an upright 32, which is secured on a brace between the two arms of the scale-beam 2. When the scale-beam swings upward, (the gate 18 being closed,) the pin 30 will strike against the upper member 28 of the arm 27, thus raising it. It will be seen that as the arm and gate are raised the pin 30 will gradually move inward on the lower edge of the member 28 until it gets well in between the two members 28 29. When the scale-beam moves down from this position, the pin 30 presses on the lower member 29 of arm 27, thus bringing the gate 18 back to its closed position.

The auxiliary feed comprises the spout 17,

secured to and communicating with the main hopper 13 and discharging into peripheral receptacles on a rotary wheel conveyer 33, which latter delivers the grain to the spout 34, closed 5 by the gate 35. The wheel conveyer 33 is disposed between the bottom of spout 17 and top of spout 34 and turns with a shaft 36, supported in brackets 37. The sides of the wheel conveyer may be conveniently made of thin 10 sheets of metal to prevent the material falling out edgewise from the peripheral receptacles. The discharge from the auxiliary hopper is regulated by a gate 38, which is disposed between the main hopper 13 and the 15 auxiliary hopper. This gate 38 is mounted in grooves at the front of the spout 17 and can be raised or lowered by means of a thumb-screw 39, disposed in an arm or bracket 40 and swiveled at its lower end to said gate 38. 20 One side of spout 34 is mounted on shaft 36 and the other side secured to the spout 16 by any approved means.

Gate 35 is secured to depending arm 42, which turns on shaft 36, and two other arms 25 43 and 44 are integral with said arm 42. The arm 44 is adapted to be raised by an arm or lug 45, secured to the scale-beam 2, when the scale-beam rises, thus opening gate 35. Arm 43 is provided with a tooth 45^a at its end to 30 engage a ratchet-wheel 46, which will hereinafter be described. The arm 44 is held in its upper position by the depending arm 47, which is pivotally connected at its upper end to support 48, secured to the hopper 13, as shown. 35 As the scale-beam swings down, however, the lug 45 presses on a pin or projection 49^a on said arm 47 and pushes the latter outwardly, thus allowing the arm 44 to fall and close the gate 35 to cut off the supply of material and 40 stop the ratchet-wheel 46. The gate 35 is located close to the top of where the material will be in the hopper or bucket 49 when the weight is almost made up, so that when it is closed there will be comparatively no material in suspension, thus effecting exact weight. 45

The driving mechanism of wheel conveyer 33 consists of a cone or pulley (for the reception of a driving-belt) fastened on shaft 51. A ratchet-wheel 46 and gear-wheel 52 are secured 50 on the shaft 51. The gear-wheel 52 meshes with a gear-wheel 53, secured on shaft 36 or to the wheel conveyer 33. The belt is preferably put on loosely and continues to move should the pulley be stopped, so that when 55 the tooth 45 engages the ratchet it stops the whole mechanism. It will be noticed that very little power is required to drive wheel 33, nor is it necessary for it to stop during the time gate 35 is closed, so the material which 60 is being brought down during the interval and accumulated in the lower end of spout 34 will immediately run out after gate 35 is opened. In the use of some materials it may not be necessary to use any driving mechanism whatever for wheel conveyer 33, and 65 hence I do not wish to be limited to any particular means for turning said wheel.

A bucket 49 is pivoted on the scale-beam or knife-edges by hangers 54 54. It is designed to be raised as close to the source of 70 supply as possible, and therefore its upper position partially incloses the lower ends of both spouts 16 and 34. At the bottom of bucket 49 two doors or gates 55 55 are arranged to 75 open downwardly and outwardly and are pivotally connected with shafts 56 56, carried by cross-arms 57 57, secured to the bucket. The upper ends of doors or gates 55 55 are pivotally connected with shafts 58 58, carried by 80 arms 59 60, on which they turn. The arms 59 60 turn on studs or pintles 61 61, located one on each side of the bucket at the center thereof and mounted in slots or openings 63 85 in the hangers. The positions of all shafts and journals are of course maintained by screw-nuts, pins, or other suitable means.

Uprights 62 62 are secured to the frame A and are provided with bifurcated upper ends, whereby when the bucket is in its lower position the extended ends of studs or pintles 90 61 61 will strike said uprights and throw the gates open and discharge the contents of the bucket into the discharge-funnel, and when the bucket 49 is raised the arms 59 60, being 95 of sufficient weight to counterbalance the weight of the doors or gates, will close same and permit the weighing to be resumed.

The pan or receptacle 10 heretofore referred to is provided on its lower face with a projection 64, adapted to strike the head of 100 a rod 65 when the pan is lowered. This rod 65 extends downwardly through the top of a cup 66, containing mercury or liquid, and said rod is provided on its lower end with a flat disk or plunger 67, which acts as a float. 105 The mercury is adapted to take up the rebound and jar from the scale-beam occasioned by rapid discharge of material from bucket 49 and resulting action of weight 11. A pin 68 is adapted to pass through the rod 65, on 110 which pin one end of a slotted lever 69 is disposed. This lever is pivoted between its ends to an upright 70, secured to the frame A and provided on its outer end with a counterweight 71. An upright arm 72 is provided 115 on said lever 71, which arm has pivoted at its upper end a detent-catch 73. A curved slot 74 is provided in said catch 73, through which a pin 75 on the upright or support 70 is adapted to pass. The catch 73 is also provided 120 with parallel arms or lugs 76 77, the upper arm or lug 76 being preferably longer than the lower lug or arm 77. The use of this catch and cooperating mechanism is to stop the downward momentum of the scale 125 just at the time gate 18 has closed and the pin 30 is freed from the bracket 27. The catch 73 is adapted to receive between its parallel lugs 76 77 a lug or projection 78, secured to one of the hangers 9. When the pan 10 is 130 down and lever 69 is in its lowest position, the catch 73 is in the position shown in Fig. 5, where all the parts are locked by the pin 75 being in the upper end of the curved slot

74. As soon as the pan rises the lug or projection 78 strikes the upper arm or lug 76 and raises the catch to a horizontal position. In this position there can be no oscillation to the scale either up or down. It will be noticed that lever 69 cannot be moved upward until catch 73 is raised. As soon, however, as the lug 78 raises the catch the mercury or other liquid in the cup will, together with the counterweight, raise the lever and disk thereon, and hence the parts are again in position to repeat their operation.

Various slight changes might be made in the general form and arrangement of the several parts described without departing from the spirit and scope thereof, and hence I would have it understood that I do not wish to limit myself to the precise details set forth, but consider myself at liberty to make such slight changes and alterations as fairly fall within the spirit and scope of my invention.

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

1. The combination with a scale-beam, a bucket supported at one end thereof, a weight having a fixed relation to the other end and means for controlling the discharge of material into and from said bucket, of a curved guideway attached to the scale-beam at respective sides of its fulcrum and having a pocket at each end and a movable device adapted to travel from end to end of said guideway and become seated in one or the other of said pockets.

2. The combination with a base, uprights on said base, scale-beams mounted on said uprights, a weight at one end of said scale-beam and a bucket at the other end of said beams, of a main hopper disposed above said bucket and adapted to empty thereinto, an auxiliary hopper communicating at its upper end with said main hopper and discharging directly into the bucket, a gate for the main hopper, a gate for the auxiliary hopper and devices on the scale-beam adapted to operate the main gate and subsequently operate the gate of the auxiliary hopper.

3. The combination with a pivoted scale-beam provided with a weight-receptacle at one end and a bucket at the other end of said scale-beam, of a main hopper disposed over said bucket, a door or gate on said hopper, means on said scale-beam to operate said gate, an auxiliary hopper communicating with said first-mentioned hopper, a wheel conveyer communicating with said auxiliary hopper and adapted to convey material to said bucket, a gate on said auxiliary hopper and means for opening said gate, holding it in its open position and closing said gate.

4. The combination with a base, an upright on said base and a scale-beam depending from said upright, of hangers on one end of said scale-beam, a weight-receptacle supported by said hangers, a bucket on the other end of said scale-beam, a guideway attached to said

scale-beam at respective sides of its fulcrum and a weighted roller adapted to move on said guideway between the hangers and bucket.

5. The combination with a base and uprights on said base, of parallel scale-beams balanced on said uprights, a bucket mounted at one end of said scale-beams, hangers depending from the other end of said scale-beams, a weight-receptacle between said hangers and means between the base and scale-beam and in constant connection with both for deadening or taking up the rebound to said scale-beam.

6. The combination with pivoted parallel scale-beams, a bucket at one end of said scale-beams, a hanger at the other end of each beam, a pan or receptacle mounted in said hangers and adapted to receive weights thereon, a cup adapted to contain liquid disposed below said pan or receptacle, a disk in said cup, a rod on said disk adapted to be engaged by said pan, a lever connected with a standard and in engagement with said rod and provided with a counterweight on said lever, an arm on said lever pivotally connected with a catch connected with said last-mentioned standard, concentric arms on said catch and a lug or pin on one of said hangers adapted to engage said catch.

7. The combination with a pivoted scale-beam, a weight-receptacle on one end of said beam, a bucket on the other end of said beam, and a main hopper over said bucket and adapted to communicate therewith, of an auxiliary hopper connected with and communicating with said main hopper, a wheel conveyer adapted to convey material from said auxiliary hopper to a spout which communicates with said bucket, a gear-wheel on said wheel conveyer, another gear-wheel communicating with said last-mentioned gear-wheel, a ratchet-wheel on said last-mentioned wheel, means for turning said gear and ratchet wheels, a lever or arm adapted to engage said ratchet-wheel, a door on said spout and a lever or arm adapted to engage said door and together with said door be held in its upper position by means of a hanger on said main hopper, substantially as set forth.

8. The combination with a scale-beam, a bucket and slotted hangers whereby said bucket is suspended from the scale-beam, of hinged gates for said bucket, arms pivoted at their outer ends to the hinged ends of the gates, studs mounted to slide in the slotted hangers and having the inner ends of said arms pivotally connected thereto, and a fixed standard to be engaged by said studs when the bucket descends whereby to raise the studs and effect the opening of the gates.

9. The combination with a scale-beam, a weight-receptacle and a lug on the weight-receptacle, of a standard, a lever pivoted to said standard and having one end weighted, the other end of said lever being constructed and arranged to be moved by the weight-re-

ceptacle on the scale-beam, an arm projecting upwardly from the lever and a catch pivotally connected with said arm and connected with the standard through the medium of a curved slot and a pin, said catch having a slotted or bifurcated portion to cooperate with the lug on the weight-receptacle, substantially as set forth.

10. The combination with a hopper, of a scale-beam, a bucket carried by the scale-beam, gates for said bucket, a toggle-lever connecting said gates at points beyond their pivotal supports, a lug projecting from said toggle-lever, a fixed arm to be engaged by said lug, and a movable device carried by the scale-beam and adapted to impart momentum to the bucket, whereby to cause the lug on the toggle-lever to forcibly engage the fixed arm and cause the gates to open, substantially as set forth.

11. In a weighing-machine, the combination with a scale-beam, of slotted hangers depending therefrom, a bucket carried by said

hangers, gates for said bucket, toggle-levers pivotally connected with said gates, studs connecting the members of said toggle-levers and adapted to move in said slotted hangers and means for moving said studs to open the gates, substantially as set forth.

12. In a weighing-machine, the combination with a scale-beam, of a bucket at one end thereof, gates for the bucket, operating means for the gates, guides carried by the scale-beam, a weight-pan attached to the scale-beam, a cup under said pan, a plunger in said cup, a plunger-rod adapted to engage the pan and a catch operated by the scale-beam for controlling said plunger, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHAS. F. WOOD.

Witnesses:

J. M. HOUGH,

FRANK D. HILL, Jr.