

No. 668,437.

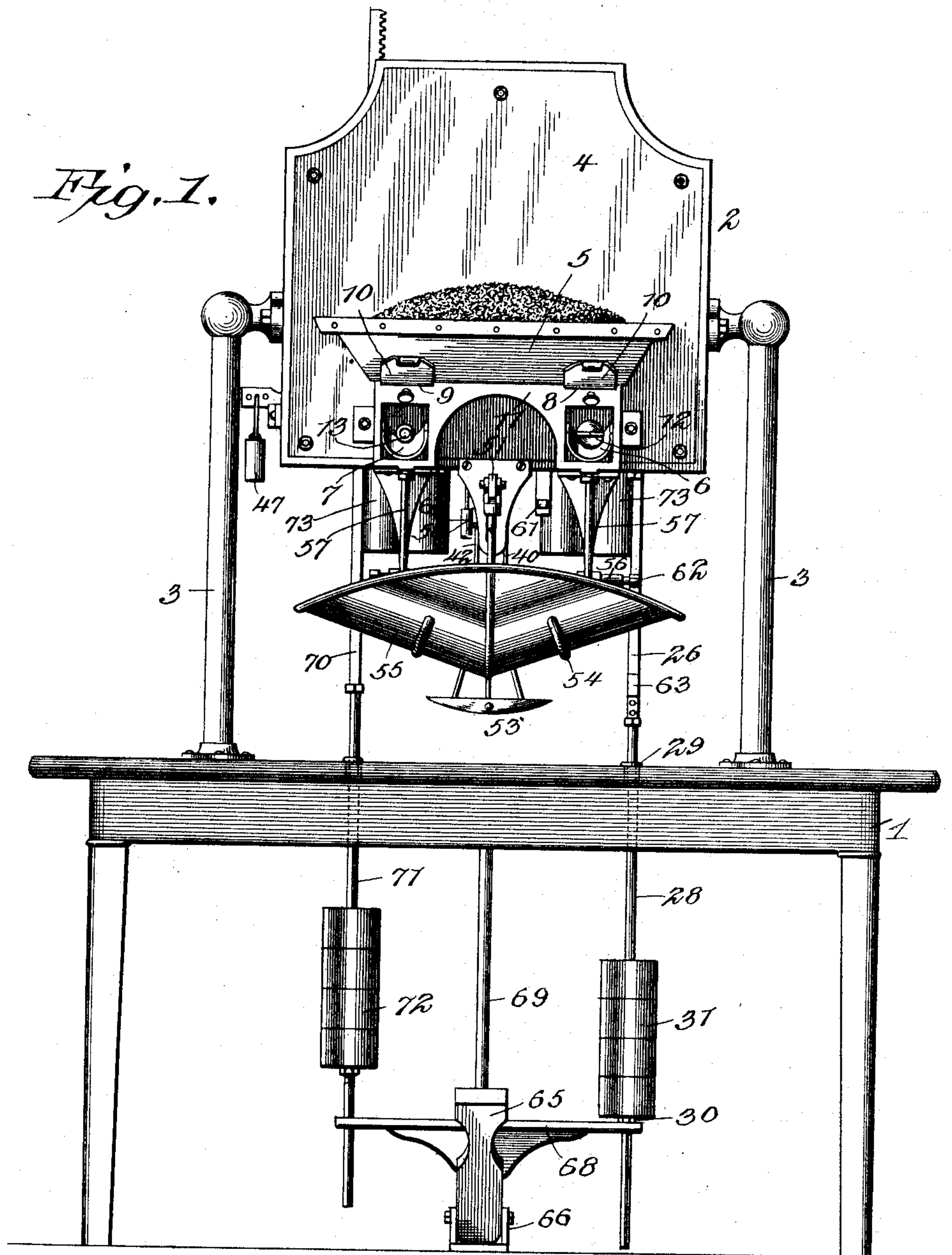
Patented Feb. 19, 1901.

A. H. CANNING.
WEIGHING MACHINE.

(No Model.)

(Application filed Oct. 29, 1900.)

4 Sheets—Sheet 1.



Witnesses
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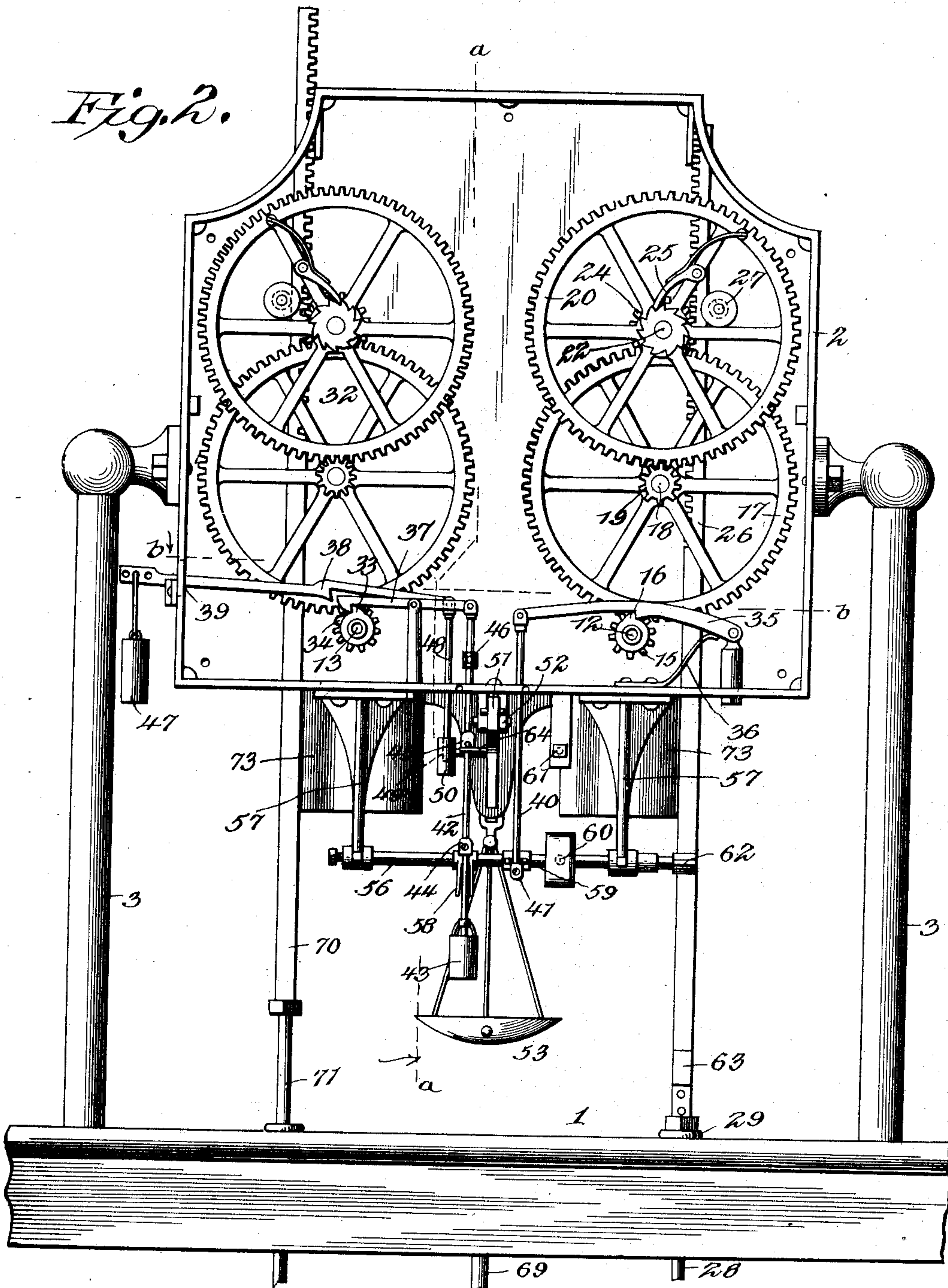
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Fig. 2.



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Fig. 3.

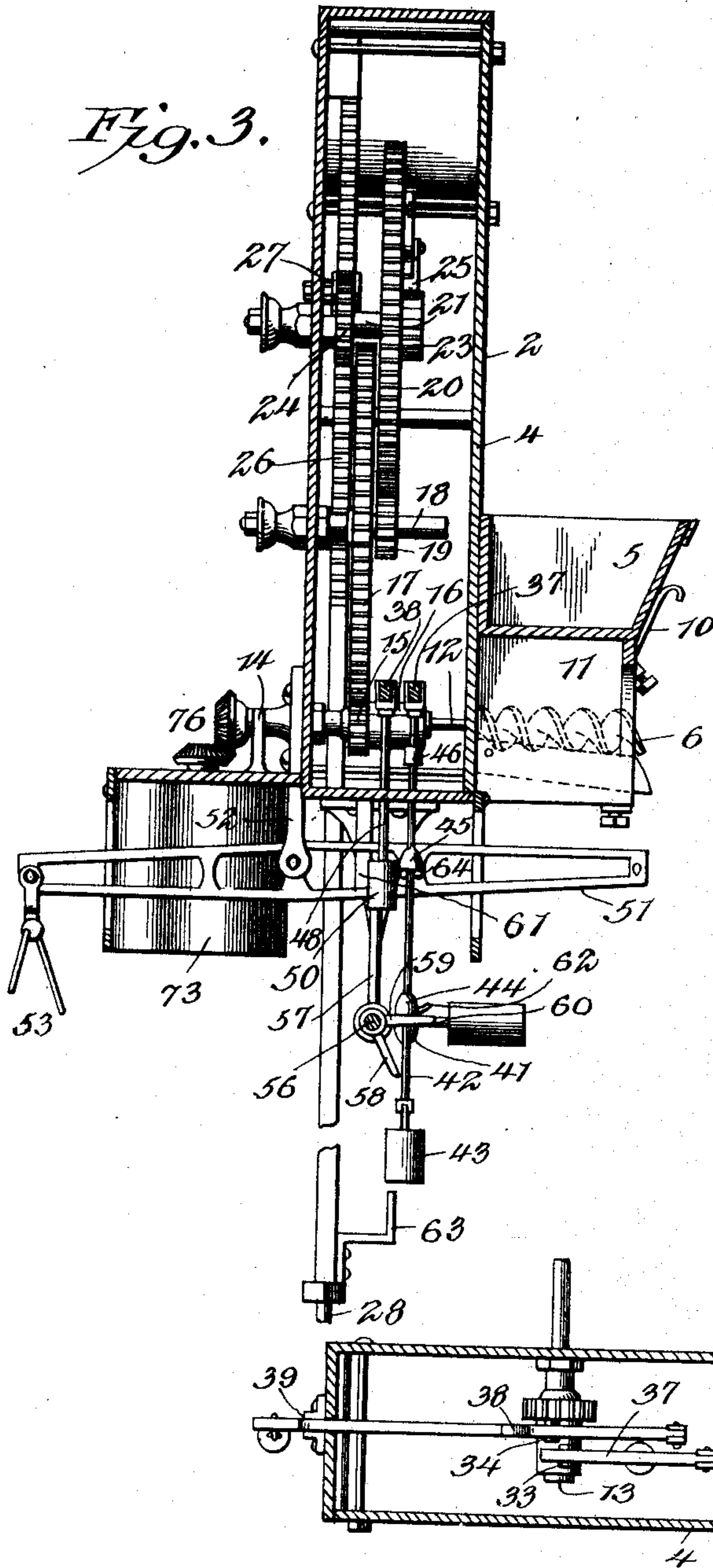


Fig. 5.

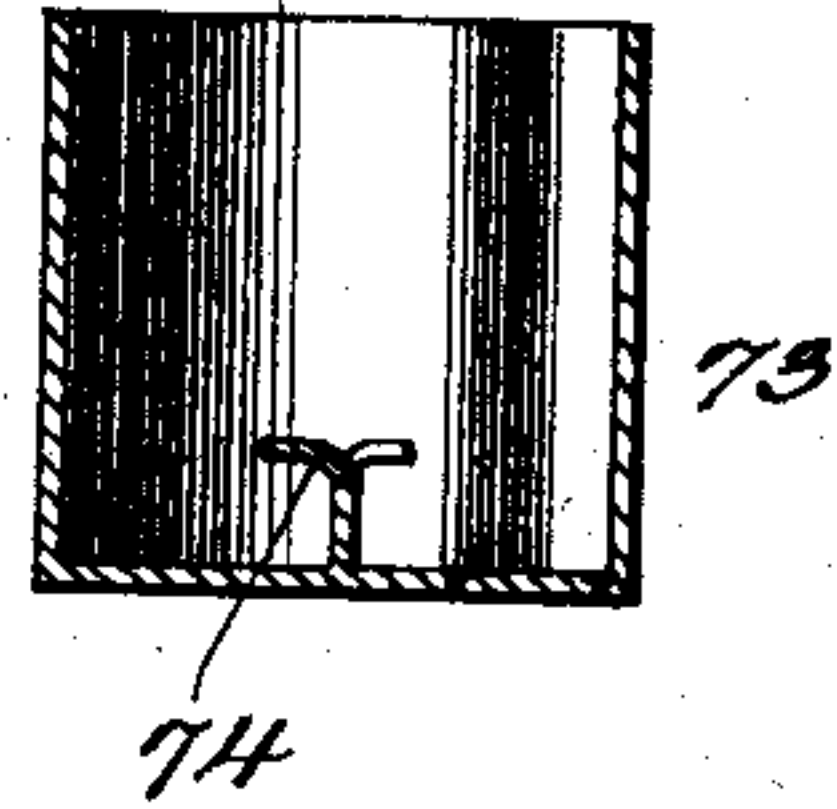
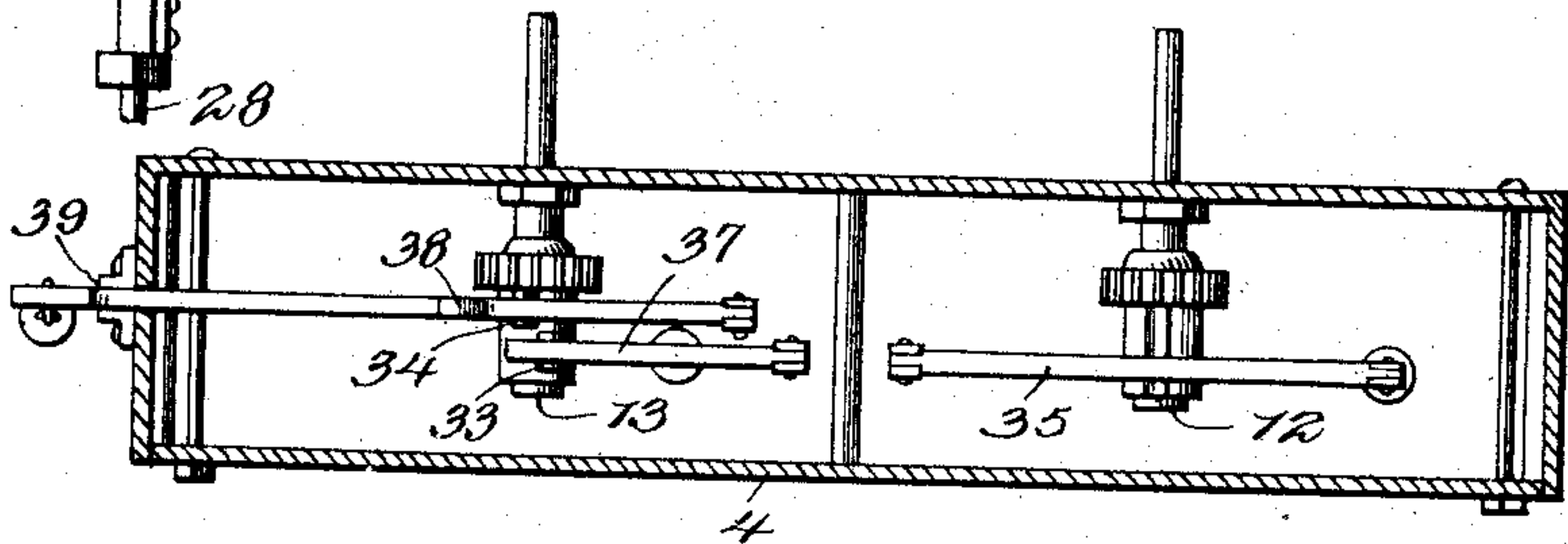


Fig. 4.



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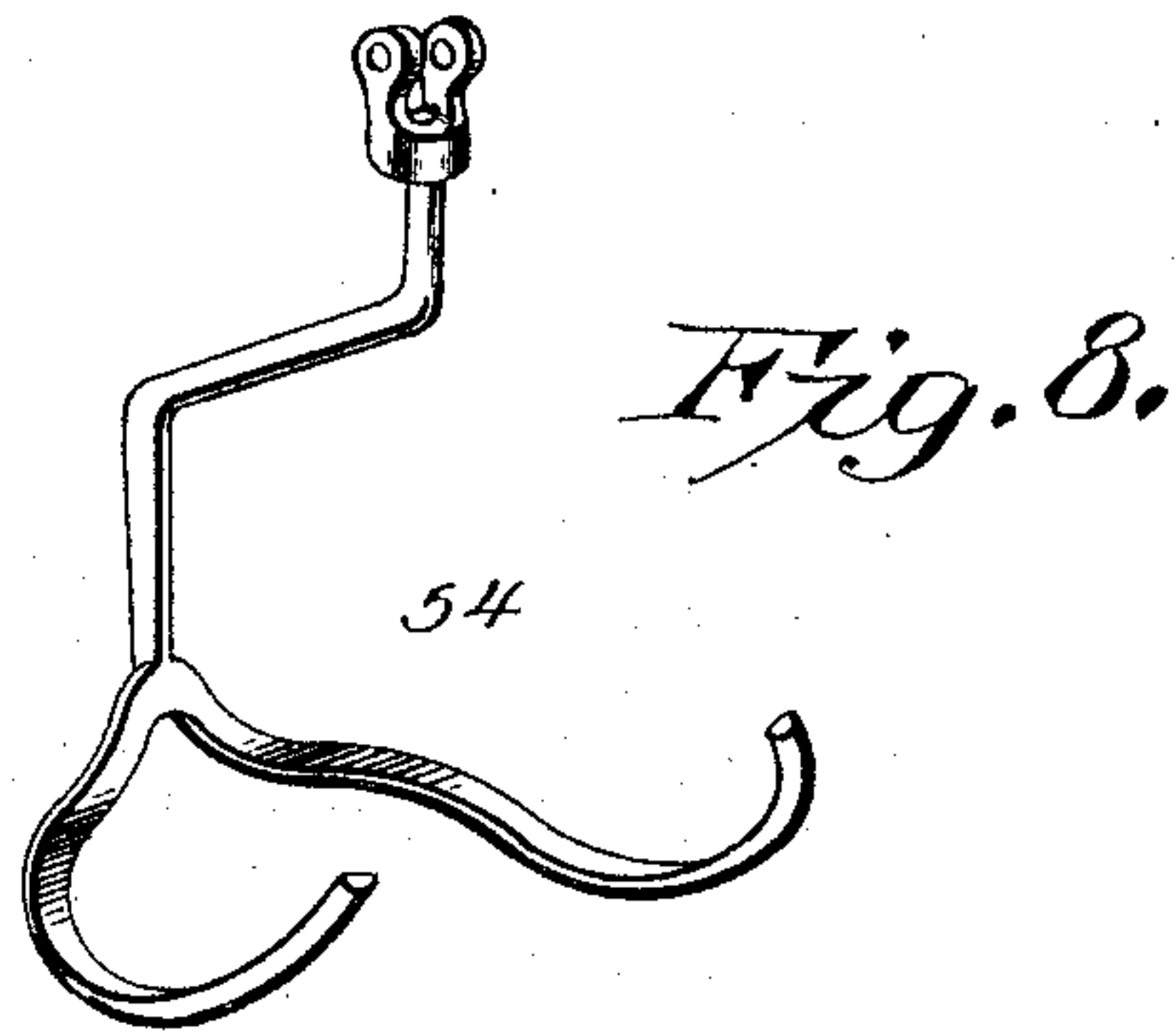
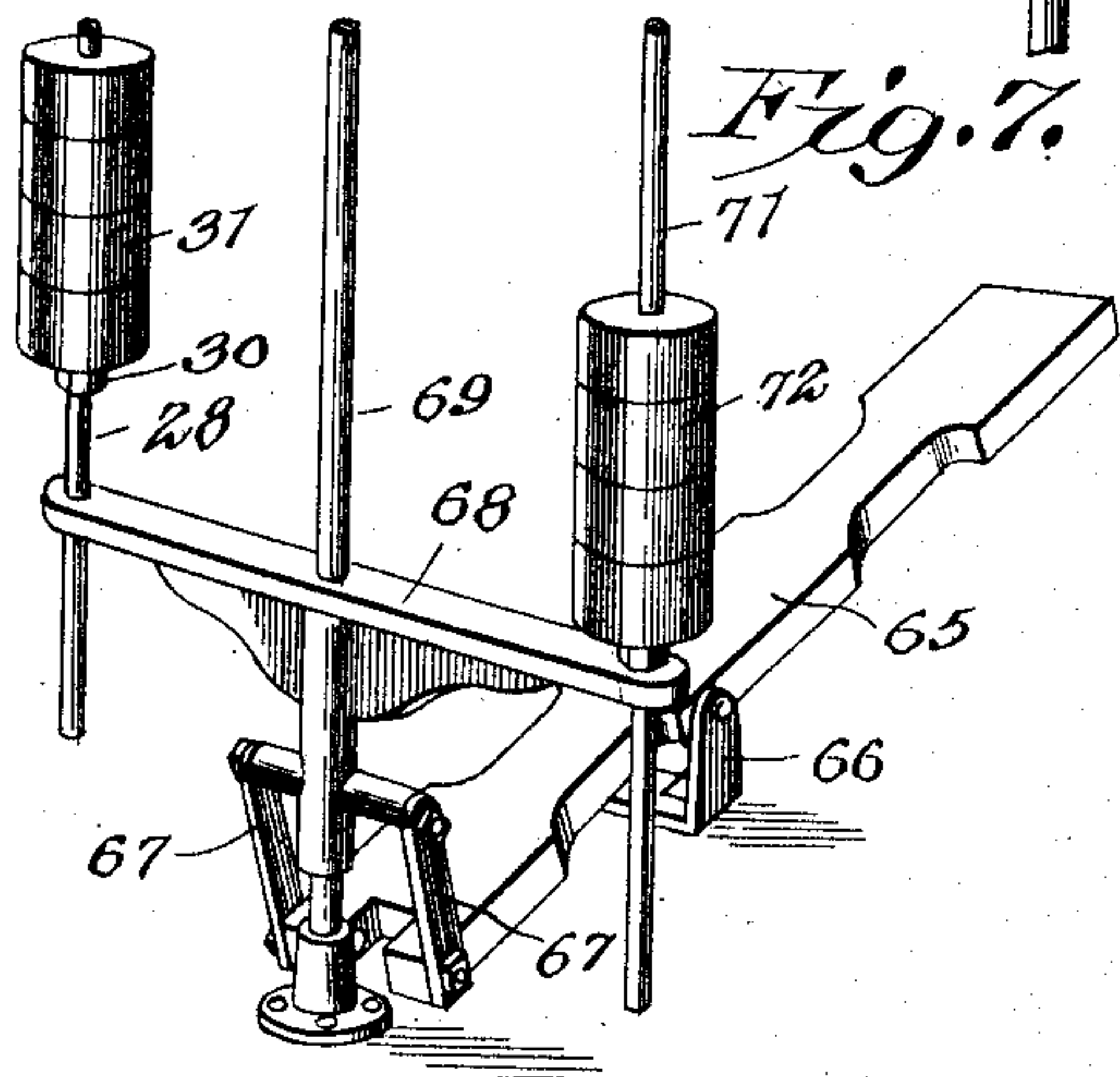
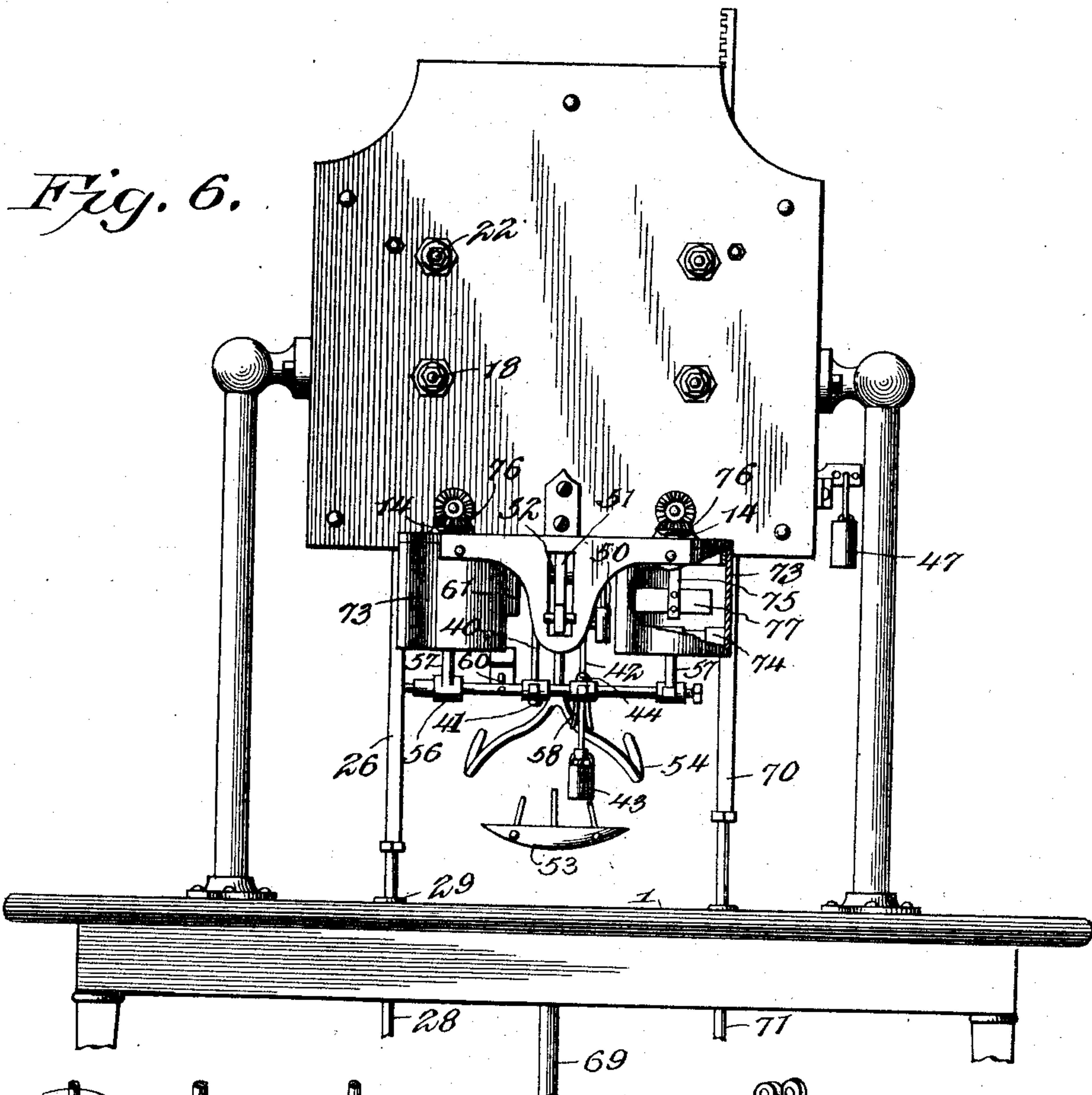
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(Application filed Oct. 29, 1900.)

4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

ALEXANDER HASTINGS CANNING, OF TORONTO, CANADA.

WEIGHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 668,437, dated February 19, 1901.

Application filed October 29, 1900. Serial No. 34,806. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER HASTINGS CANNING, a citizen of the United States, residing at Toronto, in the Province of Ontario and Dominion of Canada, have invented a new and useful Weighing-Machine, of which the following is a specification.

My invention is an improved weighing-machine adapted for automatically feeding the material which is being weighed from the tray or box to the scoop or other receptacle suspended from the scale-beam and to cut off the supply of material thereto when the required quantity has been discharged.

My invention consists in the peculiar construction and combination of devices hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a rear elevation of a weighing-machine embodying my improvements. Fig. 2 is a similar view of the same on a larger scale, the rear plate of the inclosing case being removed to disclose the gearing of the motors which operate the conveyer-worms. Fig. 3 is a vertical transverse sectional view of the same, taken on a plane indicated by the line *a a* of Fig. 2. Fig. 4 is a horizontal sectional view of the same, taken on a plane indicated by the line *b b* of Fig. 2. Fig. 5 is a detail sectional view of one of the liquid-receiving cups in which the escapement-paddles operate. Fig. 6 is a front elevation of my improved weighing-machine. Fig. 7 is a detail perspective view of the pedal and its connections for actuating the motors. Fig. 8 is a detail perspective view of the hanger for the scale-scoop.

In the embodiment of my invention herein shown I provide a suitable table 1, above which a casing 2 is supported by standards 3, one of which is located at each side of the casing. The rear plate 4 of the casing is removable therefrom at will, and said removable rear plate supports on its rear outer side a box, tray, or other suitable receiver 5 for a quantity of tea, coffee, or any other material to be dispensed and weighed. A pair of downwardly-inclined rearwardly-extending troughs 6 7 are supported under openings 8 9 in the bottom of the receiver 5, and the said openings are provided with slides 10, by

means of which they may be uncovered or closed at will. A suitable housing 11 depends from the receiver 5 and partially covers the troughs 6 7, the rear ends of the latter projecting rearward beyond the rear side of the housing for a suitable distance, as shown.

Conveyer-shafts 12 13 are journaled in suitable bearings 14, near the lower side of the casing 2, the said shafts extending transversely through the said casing and being disposed in line with the troughs 6 7, respectively. Each of the said shafts carries a worm conveyer at its rear end, the said conveyers being disposed and revoluble in the troughs 6 7. The conveyer 12, which I will term the "main" conveyer, is larger than the conveyer 13, which I will term the "auxiliary" conveyer, and the main conveyer discharges material much more rapidly from the receiver than the auxiliary conveyer, as will be understood. Each of the said conveyer-shafts is actuated by a suitable motor, which I will now describe.

The shaft 12 is provided with a pinion 15 and has a stop 16. A gear-wheel 17, which is mounted on a suitable shaft 18, engages said pinion, and a pinion 19 revolves with said gear 17 on said shaft 18. The said pinion 19 is engaged by a gear-wheel 20, which revolves loosely on a sleeve 21. The said sleeve turns on a shaft 22 and is provided at one end with a ratchet-wheel 23 and at the other end with a pinion 24. A spring-pressed pawl 25, which is carried by the gear-wheel 20, engages the said ratchet-wheel, and the said pinion 24 is engaged by a vertically-movable rack-bar 26, which is guided in suitable openings in the upper and lower sides of the casing 2. A guide sheave or roller 27 bears against the outer side of the said rack-bar. From the rack-bar depends an operating-rod 28, which is guided in an eye or opening in the table 1. The said operating-rod is provided near its lower end with a supporting-nut 30, and the said rod carries a weight or plurality of weights 31. From the foregoing it will be understood that when the rack-bar is moved upward by the operating-rod the sleeve 22 rotates loosely within the gear-wheel 20 and that the weight suspended from the said rack-bar in lowering the latter commu-

nicates power through the train of gears to the shaft 12, thereby rotating the main conveyer.

The train of gears which actuate the shaft 13 are identical with the gears hereinbefore specifically described and are designated by the reference-numeral 32. The shaft 13 is provided with two stops 33 34. A dog 35 engages the stop 16 of shaft 12 and normally locks the same against rotation. A spring 36 bears under the said dog and trips the latter from the said stop 16 to set in motion the motor which actuates said shaft 12 when the said dog is released by the means hereinafter described. A dog 37 engages the detent 33 of shaft 13 and when released from said detent by the means hereinafter described starts the motor which operates the auxiliary conveyer. A stop-dog 38, which is fulcrumed at 39, is adapted to descend and engage the stop 34 to stop the operation of the auxiliary conveyer, as will be hereinafter described.

From the free end of the dog 35 depends a rod 40, which is provided with a head or enlargement 41 at its lower end. From the free end of the dog 37 depends a rod 42, which extends through an opening in the lower side of the casing 2, has a weight 43 at its lower end, a tappet 44 at a suitable distance from its lower end, a tappet 45 at a suitable distance above the tappet 44, and a stop 46 at a suitable distance from its upper end, which said stop by engagement with the lower side of casing 2 limits the descent of said rod 42. A weight 47 is suspended from the shorter outer arm of dog 38. From the inner end of the latter depends a rod 48, which is guided in an opening in the lower side of casing 2 and has at its lower end a piston 49, which is indicated in Fig. 2 and is adapted to enter a pressure-cylinder 50, which is carried by the scale-beam 51, to compress air in said cylinder when said scale-beam is operated, as hereinafter described, to gently lift the inner end of said counterpoised dog or detent 38 and avoid causing the latter to oscillate. The scale-beam is suspended below the front side of the casing by hangers 52, at one end has the weight-pan 53, and is provided at the other end with a hanger 54, which carries the usual scoop 55.

A rock-shaft 56 is horizontally disposed under the casing 2 and is journaled in bracket-hangers 57, which depend from the said casing. The said shaft has tappet-arms 58 59, arranged at a suitable angle with relation to each other and adapted to engage the tappet 44 of rod 42 and the tappet 41 of rod 40, respectively. A weighted arm 60 projects from the rock-shaft 56. The said weighted arm is parallel with the tappet-arm 59, and when the rock-shaft 56 is partly rotated in one direction, so as to raise the weighted arm 60, the latter engages a stop 61, which is adjustable and serves to limit the play of said arm and the partial rotation of said rock-shaft, as will be understood. Said stop may be of any

suitable construction which will adapt it to be adjusted. In the form of my invention here shown said stop is a screw which engages a threaded opening in the arm that depends from the casing. The rock-shaft 56 is further provided at one end with a tappet-arm 62, which is parallel with the weight-arm 60 and is disposed in the path of a tappet 63, which is carried by the rack-bar 26. The scale-beam is provided with tappets 64, which are adapted to engage the tappet 45 of rod 42.

A suitable pedal 65 is fulcrumed on a support 66, and one end of the pedal is connected by links 67 to a cross-head 68, which operates on a vertically-disposed standard-rod 69. The rack-bar 70, which actuates the train of gears 32 of the auxiliary conveyer, has a rod 71 depending from the lower end thereof, which rod carries weights 72. The cross-head 68 has openings near its ends, in which the rods 28 72 are guided, and it will be understood from the foregoing description and by reference to the drawings, Figs. 1 and 7, that by means of the pedal and cross-head the weighted rack-bars can be simultaneously moved upward, so that their weight will be effective to operate the conveyer mechanisms.

On the front side of the casing 2 are a pair of cylindrical cups 73, each of which is provided with suitable interior baffles 74. Vertically-disposed escapement-shafts 75 have their bearings in the cover of said cups, said escapement-shafts being geared to the shafts 12 13 by the miter-gears 76 and being provided at their lower ends with escapement-paddles 77, which by rotation in the liquid contained in the cups 73 retard the rotation of the shafts 12 13 and prevent the same from operating too rapidly.

The operation of my invention is as follows: The machine is in its initial position when the dogs 35 37 are in engagement with the pinions 12 13 and the dog 38 is out of engagement with stop 34 of the auxiliary conveyer and when the tappet 41 of rod 40 is engaged by tappets 59 of rock-shaft 56 and the tappet 44 of rod 42 is disengaged by the tappet 58 of rock-shaft 56, and the scale-beam is canted by the weights, so as to raise the scoop and engage the tappets 64 with tappet 45 of rod 42. In this position of the rock-shaft 56 the weighted arm 60 is in its horizontal position. The proper weight having been placed in the weight-pan of the scale, the operator depresses the pedal, thereby causing the weighted rack-bars to be moved upward, as hereinbefore described, and the tappet 63 of rack-bar 26 to engage the tappet 62 of rock-shaft 56 and turn the latter one-fourth of a revolution, until the weighted arm 60 comes in contact with the stop-screw 61, which movement of the rock-shaft causes the tappet 59 to release the tappet 41, whereupon the spring 36 disengages the dog 35 from stop 16 of the main conveyer and the latter is set in motion by the means hereinbefore described, the said main conveyer causing the material to be

weighed to be discharged into the scale-scoop 55. When a sufficient quantity of the material has been thus discharged into the scale-scoop to counterbalance the weight, the initial movement of the scale-beam causes the tappets 64 to permit the weight 43 to lower the rod 42, and thereby disengage the dog 37 from the stop 33 of the auxiliary conveyer, and hence set the latter in motion, the descent of the rod 42 causing the tappet 44 thereof by engagement with the tappet 58, which tappet 58 was raised by the movement of the rock-shaft 56, hereinbefore described, to be turned downward, thereby restoring said rock-shaft to its initial position, the weight-arm 60 when started by its own gravity thus restoring the shaft 56 to its initial position, and the tappet 59 of said rock-shaft 56 is thus moved downward and reengaged with tappet 41 of rod 40, which rod draws downward on the dog 35 against the tension of the spring 36 and causes said dog to reengage the stop 16 of the main conveyer, and hence arrest the operation thereof. The auxiliary conveyer delivers the material in a small quantity to the scoop of the scale while the said scoop is descending, and when a sufficient quantity of the material has been thus supplied to the scoop to exactly balance the weight in the weight-pan 53 the dog 38, which being weighted, as at 49, and delicately counterpoised by the weight 47, descends with the scale-scoop and comes into engagement with the stop 34 of the auxiliary conveyer when the desired quantity of material has been supplied to the scale-scoop and stops the operation of said auxiliary conveyer, the machine thus automatically discharging and weighing the exact quantity of the material desired.

It will be understood that any other suitable means than the gears and weighted rack-bars hereinbefore described may be employed for operating the main and auxiliary conveyers, and I do not desire to limit myself in this particular.

Where it is desired to weigh material into boxes or other packages, a suitable platform or tray will be substituted for the scale-scoop and suitable spouts will be employed to discharge the material from the conveyers into such boxes.

Having thus described my invention, I claim—

1. In a weighing-machine, the combination of a scale-beam, a feed mechanism comprising a vertically-movable weighted rack-bar, a train of gears having a pinion engaged by said rack-bar, a pawl-and-ratchet mechanism to permit of the upward movement of said rack-bar independently of said pinion, a conveyer-shaft operated by said train of gears, a pedal-lever to raise said rack-bar, and connections, actuated by the scale-beam, to start and stop said feed mechanism, substantially as described.

2. In a weighing-machine, the combination

of a scale-beam, a main feed mechanism, an auxiliary feed mechanism, means to drive said feed mechanisms, a rock-shaft, a trip mechanism for the main feed mechanism, connections between said trip mechanisms, and said rock-shaft, a trip mechanism for the auxiliary feed mechanism, connections between the said trip mechanism and said rock-shaft, and a detent for said auxiliary feed mechanism, said detent being operated by said scale-beam, substantially as described.

3. In a weighing-machine, the combination of a scale-beam, a main feed mechanism, an auxiliary feed mechanism, means to drive said feed mechanisms, a rock-shaft, a trip mechanism for the main feed mechanism, connections between said trip mechanism, and said rock-shaft, a trip mechanism for the auxiliary feed mechanism, connections between the said trip mechanism and said rock-shaft, and a detent for said auxiliary feed mechanism, said detent being operated by said scale-beam, said detent being counterpoised and having a piston engaged by a dash-pot carried by said scale-beam, substantially as described.

4. In a weighing-machine, the combination of a main feed mechanism, means to drive the same, a dog to arrest the rotation thereof, an operating-rod for said dog, a rock-shaft having a weighted arm and a tappet coacting with a tappet on said rod, said rock-shaft having a tappet disposed at an angle to that of the before-mentioned tappet, an auxiliary feed mechanism, means to drive the same, a dog to normally secure the same against rotation, said dog having a weighted operating-rod, a scale-beam having a tappet coacting with a tappet on said weighted operating-rod, the latter having a tappet to engage the auxiliary tappet of the rock-shaft and means operated by the scale-beam to stop said auxiliary feed mechanism, substantially as described.

5. In a weighing-machine, the combination of a scale-beam, a main feed mechanism, an auxiliary feed mechanism, each of said feed mechanisms comprising a vertically-movable weighted rack-bar, a train of gears having a pinion engaged by said rack-bar, a pawl-and-ratchet mechanism to permit of the upward movement of said rack-bar independently of said pinion, and a conveyer-shaft actuated by said train of gears, a pedal-lever, a cross-head movable vertically thereby, said cross-head being engaged by said rack-bars, and coacting with stops on said rack-bars to elevate the latter, and connections actuated by the scale-beam, to successively start and stop said main and auxiliary feed mechanisms, substantially as described.

6. In a weighing-machine, the combination of a scale-beam, a feed mechanism comprising a vertically-movable weighted rack-bar, a train of gears having a pinion engaged by said rack-bar, a pawl-and-ratchet mechanism to permit of the upward movement of said

rack-bar independently of said pinion, a conveyer-shaft operated by said train of gears, an escapement-shaft geared to said conveyer-shaft and having escapement-paddles, a liquid-containing receptacle in which said escapement-paddles rotate, a pedal-lever to raise said rack-bar and connections actuated by the scale-beam, to start and stop said feed mechanism, substantially as described.

7. In a weighing-machine, the combination of a scale-beam, a main feed mechanism, means to drive the same, an auxiliary feed mechanism, means to drive the same, escapement-shafts geared respectively to said main and auxiliary feed mechanisms, said escapement-shafts having escapement-paddles, liquid-containing cups in which said escapement-paddles rotate, said cups having baffles to retard the rotation of the liquid therein and connections actuated by the scale-beam, to successively start and stop said main and auxiliary feed mechanisms, substantially as described.

8. In a weighing-machine, the combination

of a scale-beam, a main feed mechanism, an auxiliary feed mechanism, a trip mechanism for each of said feed mechanisms, a rock-shaft, weighted on one side, means to predetermine the extent of the oscillations of said rock-shaft, said rock-shaft, having radial tappet-arms disposed at an angle with relation to each other, rods depending from elements of said trip mechanisms and having tappets, coacting with said tappet-arms successively, said rod of said auxiliary trip mechanisms and said scale-beam having coacting tappets, and a detent for said auxiliary feed mechanism, said detent being connected to and actuated by said scale-beam, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ALEXANDER HASTINGS CANNING.

Witnesses:

THOMAS ALEXANDER GIBSON,
ALFRED ASHBY.