No. 615,495. Patented Dec. 6, 1898.

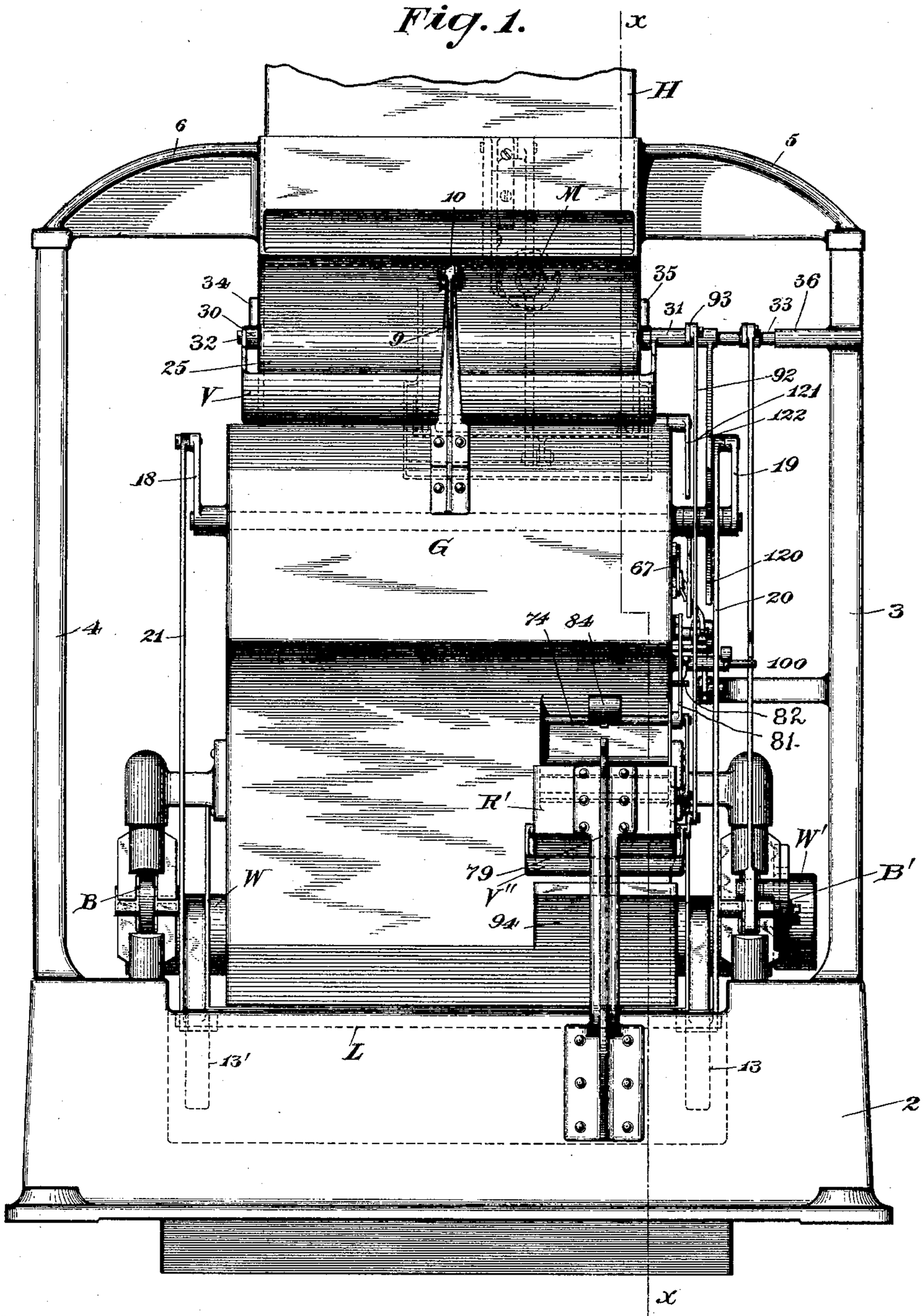
F. H. RICHARDS.

WEIGHING MACHINE.

(Application filed Jan. 25, 1898.)

(No Model.) 6 Sheets—Sheet 1.

Fig. 1.



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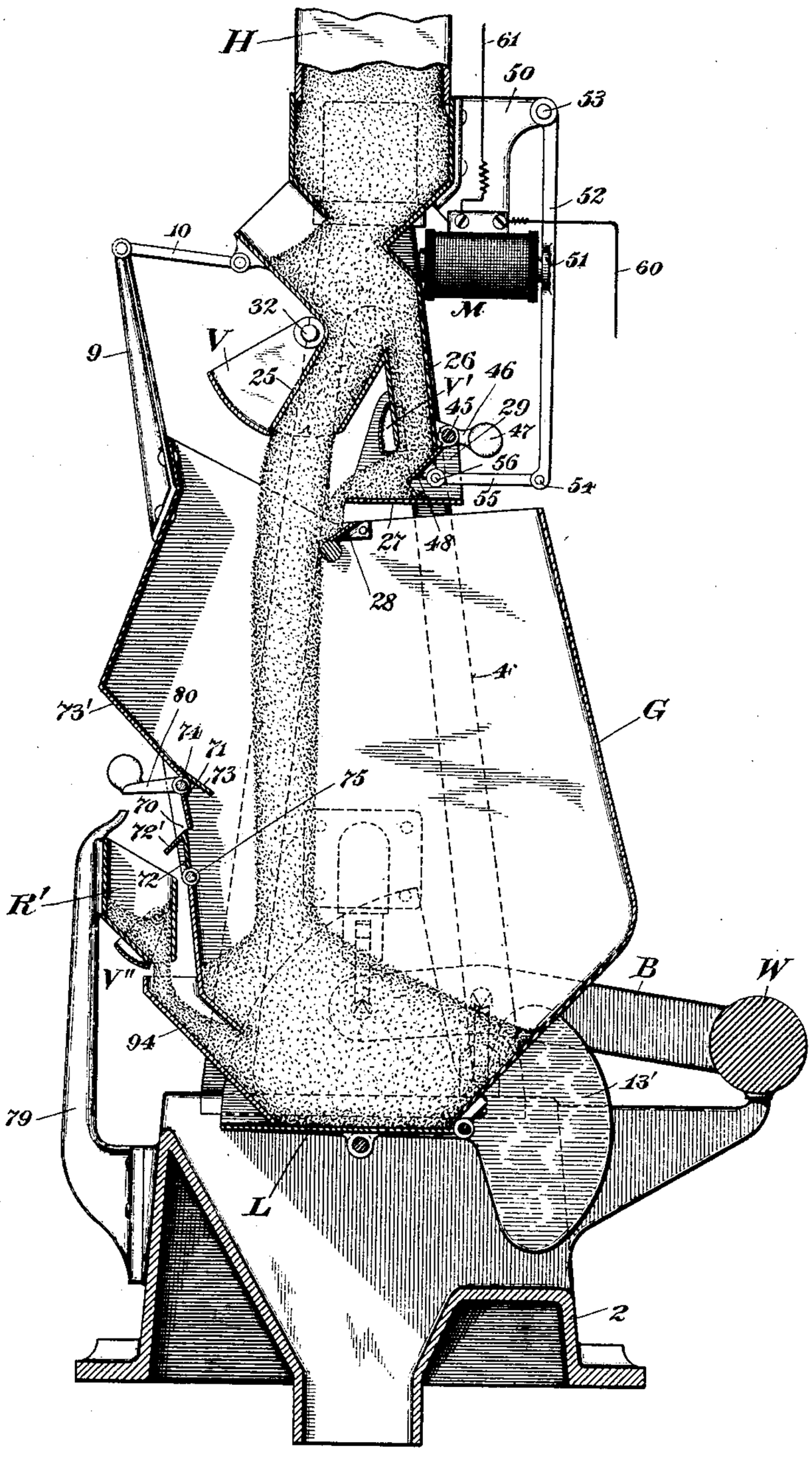
(No Model.) 6 Sheets—Sheet 2.

Fig. 2.



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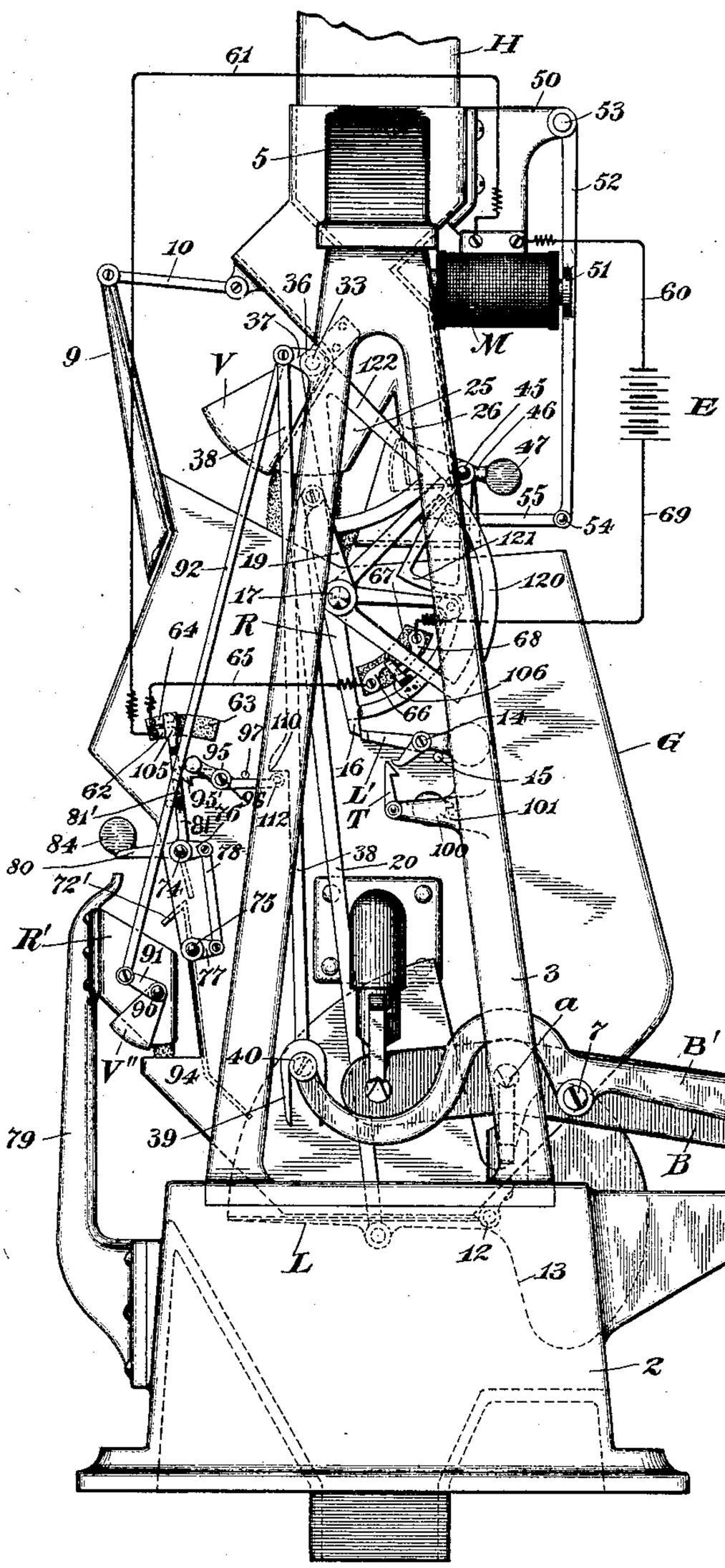
(No Model.) 6 Sheets—Sheet 3.

Fig. 3.



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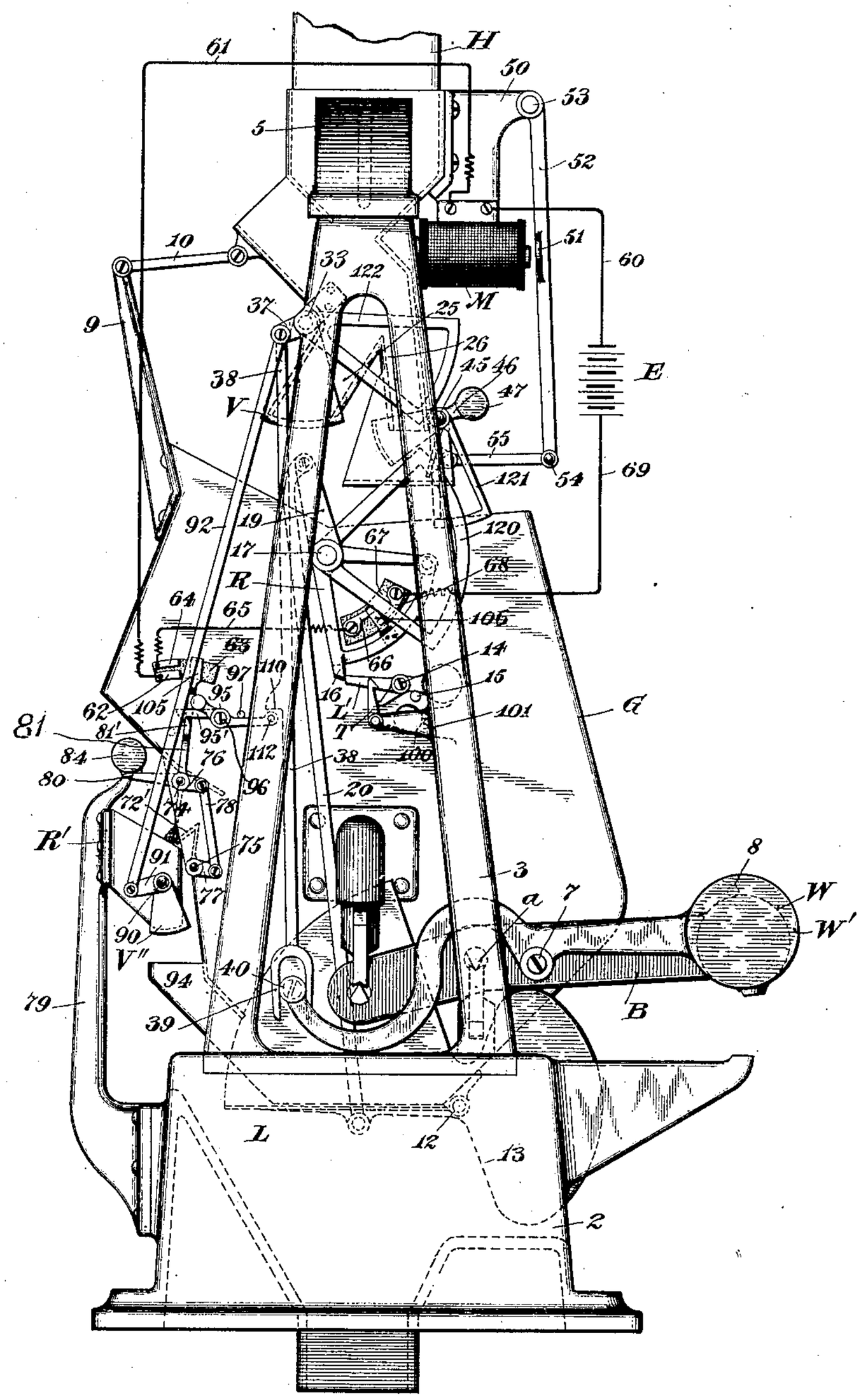
(No Model.) 6 Sheets—Sheet 4.

Fig. 4.



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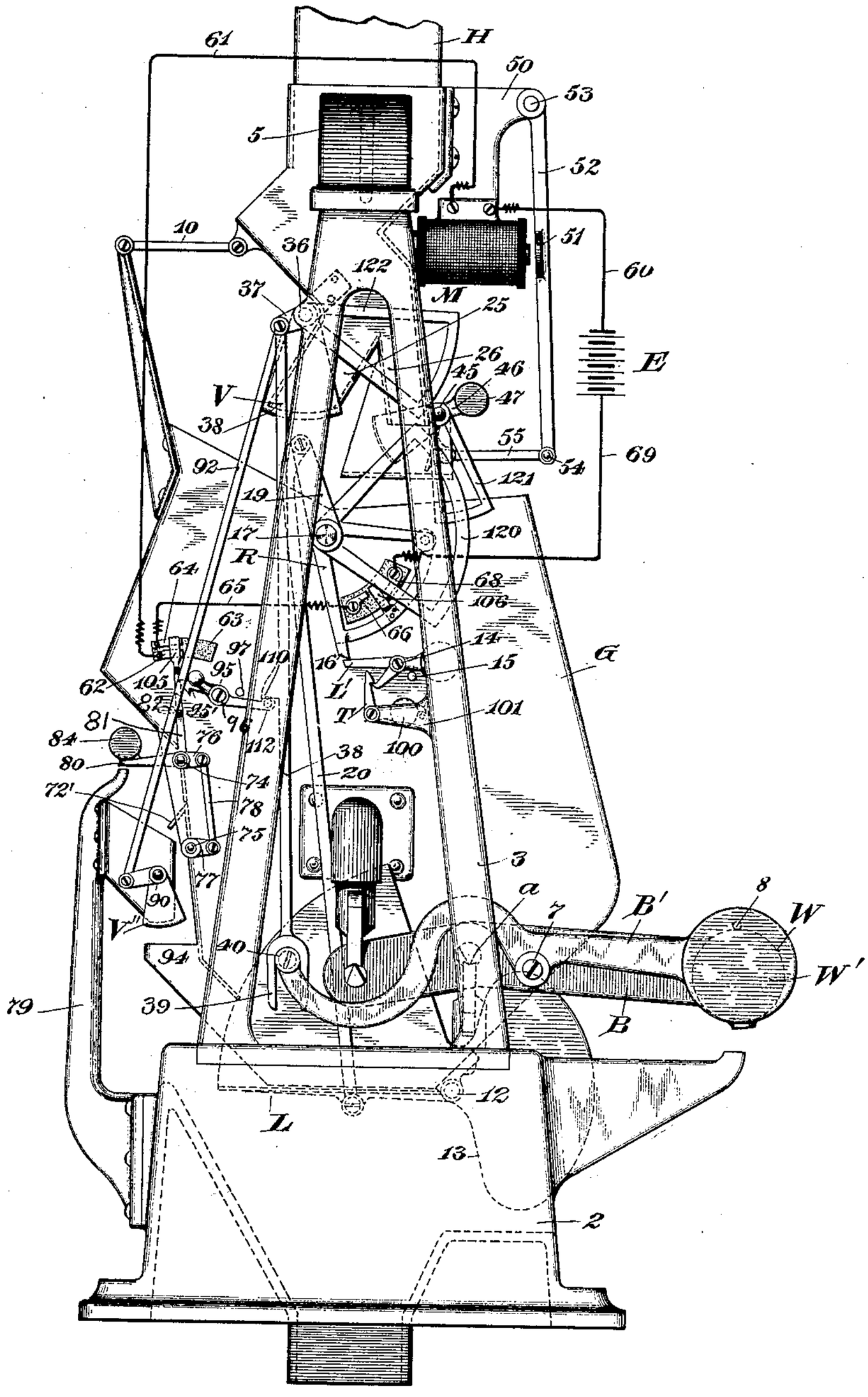
(No Model.) 6 Sheets—Sheet 5.

Fig. 5.



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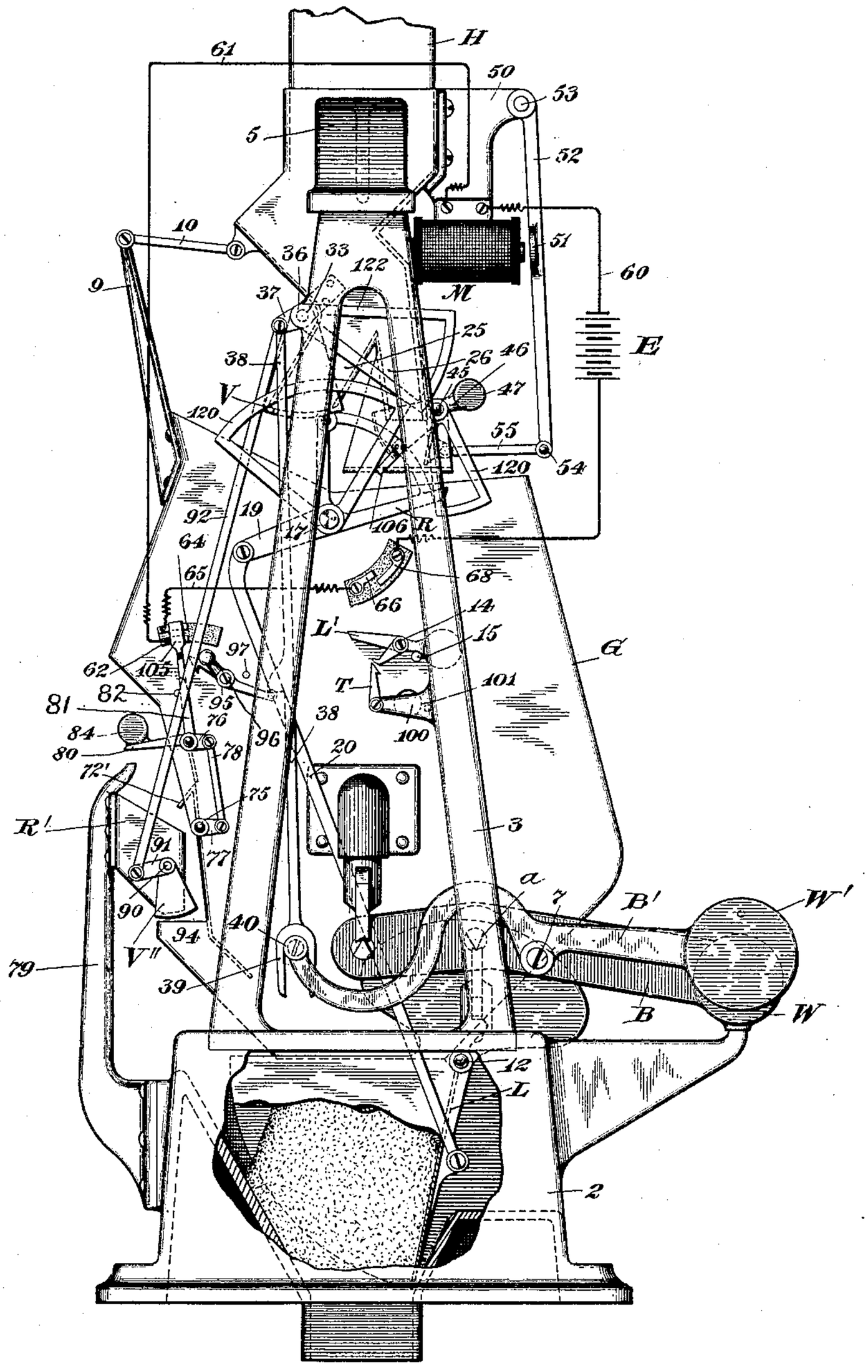
(No Model.) 6 Sheets—Sheet 6.

Fig. 6.



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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT.

WEIGHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 615,495, dated December 6, 1898.

Application filed January 25, 1898. Serial No. 667,872. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Weighing-Machines, of which the following is a specification.

This invention relates to weighing-machines.

One of the objects of the invention is the provision of weighing mechanism involving a load-receiver, a spout or spouts for supplying a stream or streams of material to said load-receiver, a valve or valves, stream-actuating means for operating one of said valves, means acting normally in opposition to said stream-actuated valve-operating means, and means for releasing said valve.

In the present case the stream-actuated devices for operating the valve consist of a blade located at the discharge end of a supply-spout and connected with the valve, the gravitating material supplying the force to close said valve, and for the purpose of holding the valve open an electrically-operated device, such as a magnet, may be employed, the circuit in which said device is located being automatically controlled. When said device or magnet is energized, the valve is held open, but on breaking the circuit the stream-actuating device referred to is operable promptly to shut the valve.

In connection with a supply-spout and a valve therefor I prefer to employ a plate or shelf located below and transverse to the spout, the force of impact of the supply-stream issuing from said spout being applied to the plate before said stream reaches the load-receiver, and said plate is so mounted as to act as a partial cut-off, thereby aiding the valve, and consequently minimizing the power to operate the same.

My improved weighing-machine includes overloading means—that is, means for supplying a body of material to the load-receiver of the weighing mechanism in excess of the predetermined load; and a further object of the invention is to provide novel means for removing the surplus, said latter means including a pair of valves adapted to close a load-reducing opening formed in the load-receiver, preferably between the supply and discharge ends thereof, and said valves are mounted at opposite sides of said opening and are preferably reversely oscillatory, and when opened they will permit the surplus or excess to be discharged from the load-receiver and into a surplus-load receiver properly positioned to receive the same, and to guide the material into the surplus-receiver one of the valves will have a deflected or angular portion. The supply-valve or one of the supply-valves, as before stated, is operated in one direction by an electrically-operated device, and the circuit in which said device is included is closed, preferably, at two different places by automatic alternately-effective devices operative, respectively, with the load-reducing and the load-discharging means, the circuit being broken, respectively, when these two means are in operation, and it will be apparent that at all other times the supply-valve is held closed by the energization of the magnet.

In the drawings accompanying and forming part of this specification, Figure 1 is a front elevation of my improved weighing-machine. Fig. 2 is a longitudinal section of the same, taken in the line *x x*, Fig. 1; and Figs. 3, 4, 5, and 6 are side elevations as seen from the right in Fig. 1 and show the positions occupied by the parts during the making and discharging of a load.

Similar characters designate like parts in all the figures of the drawings.

The framework for supporting the different parts of the machine consists of the chambered base or bed 2, uprights 3 and 4, mounted thereon, and the brackets 5 and 6, extending oppositely from the supply chute or hopper H, constituting convenient means for supplying material to the load-receiver of the weighing mechanism.

The weighing mechanism includes a load-receiver, as G, and supporting-beam mechanism, as B and B′, respectively, the main beam B shiftably supporting the auxiliary beam B′. The main beam B is of a construction and is mounted and supports the load-receiver G, substantially as represented in Letters Patent No. 548,840, granted to me October 29, 1895, to which reference may be had, and its center of oscillation is indicated by *a* and its counterpoise by W. The auxiliary beam B′ is shiftably mounted upon the main beam B,

between the fulcrum or center *a* and the counterweight W, the two parts being connected by a pivotal joint 7.

The counterpoise or weight W′ of the auxiliary beam is provided with a pin 8, normally resting upon the adjacent weight W of the main beam, by reason of which the opposite or free end of the auxiliary beam constitutes practically a fixed extension of the main beam B and serves to control in part the supply apparatus, it being also shiftable to decrease the effect of the total counterpoise—that is, when the pin 8 is raised clear of the beam-weight W the total counterpoise is less—and by reason of the connection of the auxiliary beam with the main beam at a point between the fulcrum and the counterpoise of the latter the motion of the auxiliary beam relative to the main beam is limited.

The means for shifting the auxiliary beam relatively to the main beam will be hereinafter described.

The load-receiver has near its upper end the riser 9, connected by the guide-link 10 with the chute or hopper H, whereby undue oscillation of the load-receiver is checked as it rises and falls.

The load-receiver terminates in the usual discharge-outlet covered by a closer or flap L, consisting of a plate pivoted, as at 12, to the load-receiver and counterweighted, as at 13 and 13′, the counterweights serving to shut the closer on the discharge of a load.

The means for holding the closer shut includes a latch, such as L′, of ordinary construction, counterweighted and pivoted, as at 14, upon the load-receiver, the latch being located to engage the arm 16 of the rocker R, secured to the shaft 17, extending through the load-receiver and having at its opposite end the crank-arm 18. The rocker R has the crank-arm 19, to which the rod 20 is pivoted, a similar rod 21 being pivoted to the crank-arm 18, and the lower ends of these rods are likewise jointed to opposite sides of the closer L. The latch L′ normally engages the rocker-arm 16. When disengaged therefrom, the closer L is free to be opened by the load in the load-receiver.

My improved weighing-machine involves means for overloading the load-receiver by supplying to the latter a supply of material in excess of or beyond the predetermined or true load, and the chute H serves as a convenient device for thus overloading the load-receiver. Said chute terminates in the spouts 25 and 26, respectively (see Fig. 2) adapted to deliver streams of material into the load-receiver, the stream from the spout 26 first striking the horizontal break-plate 27, and from thence onto the angular plate 28, located within and secured to the opposite side walls of the load-receiver. The plate 27 has vertical side walls, as 29, secured near the end of the spout 26. The fixed or stationary plate 27 serves to break the force of impact of the falling stream from the spout 26 and also acts as a partial cut-off, thereby relieving the valve for said spout.

The valves for the spouts 25 and 26 are designated by V and V′, the valve V being closable under the outlet of the spout 25 to cut off the stream therefrom, while the valve V′ is movable toward the plate 27 to assist the latter in stopping the supply from the spout 26.

The valve V is provided with the oppositely-disposed hubs 30 and 31, adapted to receive the pivots 32 and 33, fixed in the brackets 34 and 35 (see Fig. 1) at opposite sides of the spout 25. The pivot 33 is seated in the bearing 36 on the upright 3, and the valve-operating mechanism is connected with said pivot. The valve V is a self-closing or gravity valve, it being of sufficient weight below its axis to shut by its own action, and it is controlled by the auxiliary beam B′, the latter serving on its return movement to open the valve. The pivot 33 has a crank-arm 37, to which the controlling-rod 38 is pivoted, said rod terminating in a bifurcation 39, straddling the projection or antifriction-roll 40 at the inner end of the auxiliary beam B′. When said free end descends, the valve V is permitted to close, and it will be apparent that on the ascent of the auxiliary beam said valve is opened.

The valve V′ is reciprocatory toward and from the plate 27 and is carried, preferably, by the rock-shaft 45, fixed in suitable bearings on the spout 26 and provided with the rearwardly-extending arm 46, carrying a balance-weight 47. The valve V′ is movable toward the horizontal plate 27 to assist the latter in cutting off the supply from the spout 26 and is operated in said direction preferably by a stream or material actuated device situated adjacent to the outlet of the spout 26 and between said spout and the plate 27, and said stream-actuated device consists, preferably, of a flat blade 48, (see Fig. 2,) fixed to the shaft 45. The descending stream from the spout 26 by acting against the blade 48 tends normally to close the valve, suitable means acting in opposition to the stream-actuated device being provided to lock or hold the valve open. When the valve is released, however, the blade is forced downward, and being connected with the valve V′ through the intermediate shaft 45 said valve will be promptly moved toward the plate 27 to stop the flow of material over said plate into the load-receiver.

The means acting in opposition to the stream-actuated device consists, preferably, of an electromagnet M, which is normally energized to attract its armature, the latter being mounted on a member connected with the blade 48. The magnet M is secured to the bracket 50 on the chute or hopper H, and its armature 51 is fixed to the bar 52, pivoted, as at 53, to said bracket 50, the opposite end of the bar being pivoted, as at 54, to the link 55, likewise jointed, as at 56, to the blade 48. In Fig. 2 the magnet is energized, at which time the core of said magnet has attracted

its armature 51, and consequently draws the bar 52 inward, the link 55 serving to hold the blade 48 in its primary position, where it receives practically the full effect of the stream issuing from the spout 26. On the deënergization of the magnet M the material will force the plate 48 toward a vertical position and will draw the valve V′ downward to stop the passage of material from the spout into the load-receiver. When the magnet is energized, its armature 51 will be attracted, and consequently the valve V′ will be opened.

The magnet M is represented connected with a suitable source of electric energy, as a battery E. The battery E is connected by the wire 60 with the magnet, and a wire 61 connects the latter with the contact-piece 62 on the plate 63, of insulating material, fixed to the load-receiver. Said plate 63 also carries a similar contact-piece 64, connected by a wire 65 with the contact-piece 66 on the plate 67, of insulating material, also fixed to the load-receiver, said plate having a similar contact-piece 68, connected by the wire 69 with the battery E. When the contact-pieces 62 and 64 and 66 and 68, respectively, are bridged by the circuit-controlling devices, the circuit in which the magnet is located will be established thereby to energize the magnet and hold the valve V′ open. The circuit is closed by independent devices operative, respectively, with the load-reducing means and with the load-discharging means, as will hereinafter appear.

The chute H serves to supply an overload to the load-receiver, thereby carrying the latter down to the limit of its descending movement, during which period the load-reducing means are set in operation to effect the removal of the surplus, and the load-reducing means comprises a load-reducing opening, as 70, formed at a suitable point between the receiving and discharge ends of the load-receiver and which is normally covered or closed by the valves 71 and 72, respectively, the discharge edges of which, as represented in Fig. 2, are contiguous. These valves are disposed below the sloped or inclined portion 73 of the front wall 73′ of the load-receiver, and they are reversely oscillatory and preferably supported at opposite sides of the load-reducing opening 70. The valve 71 is carried by the rock-shaft 74, the valve 72 being supported by a similar rock-shaft 75, each journaled in the front wall of the load-receiver, and the shafts are provided with rock-arms 76 and 77, connected by the link 78, whereby a simultaneous movement of the two valves may be effected, and so that they may also be operated from a single actuator, consisting in the present case of a resistance device, as the upright post 79, secured to the base 2 of the machine, the free end of said post or actuator being adapted to engage the forward-extending arm 80 when the load-receiver has practically reached the limit of its descending movement, as indicated in Fig. 4. The shaft 74 carries at its outer end the upright arm 81, resting normally against the stop 82 on the load-receiver, as shown in Fig. 3, and held in such position by the valve-closing weight 84, secured to the outer end of the arm 80.

The parts are shown in their primary positions in Fig. 3, and when the load-receiver has received its overload it will have been carried downward, thereby moving the free end of the arm 80 into contact with the upper end of the post 79, as indicated in Fig. 4, thereby swinging the upper valve 71 outward and the lower valve 72 inward, so that the surplus or excess may pass from the load-receiver into a suitable surplus-receiver, as R′, secured to the upper end of the post 79 and adjacent to the load-reducing opening 70, and as soon as the material commences to flow from the load-receiver the latter rises, and when the poising-line has been reached (indicating the complete withdrawal of the surplus) the two valves 71 and 72 will be shut by the falling of the weight 84 and until the arm 81 strikes the stop 82. On the opening of the load-reducing valves they will be locked and held in such position until the surplus has passed from the load-receiver, at which stage they will be released and can be shut by the weight 84. The lower valve 72 has a deflecting or angular portion 72′, which serves to deliver or guide the material that flows from the load-receiver into the surplus-receiver R′, provided with a valve V″, pivoted, as at 90, to said surplus-receiver, the pivot 90 having a crank-arm 91, connected by the rod 92 to a crank-arm 93 on the pivot 33 of the valve V and the construction is such that as the valve V closes the valve V″ will be closed in unison therewith, whereby the surplus can be directed into the receiver R′ without fear of escape. When the valve V is opened to overload the load-receiver G, the valve V″ of course is opened to thereby deliver the contents of the surplus-receiver into the spout 94 on the front side of the load-receiver, as indicated in Fig. 2.

It will be remembered that when the valves 71 and 72 are opened to permit the surplus to pass from the load-receiver G they are locked in such position, and for holding said valves I may employ the latch or detent 95, pivoted, as at 96, to the load-receiver, and the left-hand or weighted arm of which is in the form of a by-pass of well-known construction, said weighted arm serving to hold the opposite arm against the pin 97 on the load-receiver. The arm 81 has a catch 81′, adapted on the opening of the two valves, as shown in Fig. 4, to be engaged by the hook 95′ at the working end of the latch. When the hook is disengaged from the catch, the weight 84 serves instantly to shut the two valves.

The means for tripping the latch L′ consists of a by-pass tripper T′ of ordinary construction, pivoted, as at 100, to the bracket 101 on the side frame 3, the tripper being adapted

to operate the latch on the upstroke of the load-receiver and when the latter reaches the poising-line with the true or predetermined load.

The valve V′, it will be remembered, is held open while the magnet M is energized, and the circuit in which said magnet is located is controlled at different points, said circuit being closed by devices operative, respectively, with the load-reducing and load-discharging mechanisms. When the circuit is broken by the operation of either one of these mechanisms, the valve may be closed in the manner aforesaid.

The contact-pieces 62 and 64 and 66 and 68, respectively, are bridged at proper times by the circuit-closers 105 and 106, respectively secured to and insulated from the arm 81 and rocker R, respectively, the two circuit-closers when the parts are in their primary positions (indicated in Fig. 3) bridging the two pairs of contact-pieces.

On the opening of the load-reducing valves 71 and 72 in the manner hereinbefore indicated the circuit-maker 105 is carried to the right and off the contact-pieces 62 and 64, respectively, so that the valve V′ can be closed, as before stated, and the said circuit-maker will be held in its shifted position by the latch 95, as represented in Fig. 4. When the latch 95 is tripped on the ascent of the load-receiver, the weight 84 of course returns the circuit-maker to its initial position, where it can bridge its proper contact-pieces; but before this operation has taken place the circuit-maker 106 will have been moved off the contact-pieces 66 and 68, so that the magnet M cannot be energized until the parts have reached their initial positions. (Represented in Fig. 3.)

The latch 95 may be tripped by the projection 110 on the rod 38, said projection being disposed in the path of the pin 112 on the free end of the latch and the pin being adapted to strike said projection as the poising load-receiver rises, thereby to effect the release of the valves 71 and 72 and the circuit-closer 105. On the opening of the closer L and at an instant before the circuit-closer 105 has bridged the contact-pieces 62 and 64 the circuit-controller 106 will be moved off the contact-pieces 66 and 68 by the opening of the closer, which swings the rocker R about its axis. When the closer L is shut, this operation is reversed, and when it reaches its initial or shut position the circuit-controller 106 will bridge the contact-pieces 66 and 68, and the circuit-controller 105 lying across the contact-pieces 62 and 64 the magnet M will be energized to attract its armature, and consequently open the valve V′.

The rocker R on the shaft 17 acts as a valve-locking stop, said shaft carrying a second valve-locking stop 120, and these stops are coöperative with similar stops 121 and 122, respectively fixed to the valve-shafts 45 and 33, respectively. Each of these stops consists of a skeleton or open segment, and in Fig. 3 the stops R and 120 are shown in contact with the curved faces of the coöperating stops 121 and 122, the last-mentioned pair of stops serving to block the operation of the others in case the latch L′ should be tripped. When the stops 121 and 122, however, cross the arcs of oscillation of the stops R and 120, the latter will be released, and when the latch L′ is tripped said stops R and 120 will be swung about their axes across said stops R and 120 of oscillation of the stops 121 and 122, respectively, thereby blocking the movement of the latter when the load-receiver rises, and it will be evident that when said load-receiver rises the free end of the auxiliary beam B′ will be carried upward until it strikes the free end of the rod 38, which is locked against return movement by the stop R, by reason of which the beam B is free to return to its initial position, although the beam B′ is held shifted. When, however, the stop R returns to its primary position, (shown in Fig. 3,) the auxiliary beam B′ is released and the weight W′ thereof can drop until the pin 80 on said weight strikes the weight W of the main beam, and during this motion the auxiliary beam will impart an upward thrust to the rod 38 for swinging the valve V open.

The operation of the hereinbefore-described machine briefly set forth is as follows: In Fig. 3 the parts are represented occupying their initial positions, the closer L being shut and held in such position by the latch L′, engaging the arm 16 of the rocker R, and both valves V and V′ being wide open, so that the full volume of the supply can enter the load-receiver. When a certain quantity of material has been received by the load-receiver, it will descend, the free end of the auxiliary beam B′ moving therewith and permitting the valve V to close, this operation being concluded at the time the load-receiver reaches the poising-line. The remainder of the overload being supplied by the spout 26, the valve V′ of which is wide open, when the load-receiver reaches the limit of its movement, as shown in Fig. 4, the arm 80 will strike the actuator 79, thereby opening the load-reducing valves 71 and 72 and permitting the surplus to escape into the surplus-receiver R, the valve V″ of which is closed, and as the arm 80 is thus operated the circuit-closer 105 is moved out of contact with the contact-pieces 62 and 64, thereby breaking the circuit in which the magnet M is located and permitting the valve V′ to be shut in the manner indicated. The valves 71 and 72 when open are held by the latch 95, engaging the arm 81, and as the load-receiver rises the pin 112 on said latch will be carried against the projection 110 on the rod 38, thereby releasing the valves 71 and 72, following which they are closed by the weight 84, and at about this time the latch l′ is tripped by the tripper T, thereby releasing the closer L. As the closer opens the circuit-closer 106 is moved off the contact-pieces 66 and 68, so that the magnet

M cannot be energized. On the opening of the closer, as shown in Fig. 6, the load is discharged, and when the closer is shut the different parts are returned to their primary positions to repeat the operation.

Having described my invention, I claim—

1. The combination, with weighing mechanism involving a load-receiver, of a spout for supplying a stream to said load-receiver; a plate located below and transverse to said spout; a valve for the spout; and means controlled by the weighing mechanism, for moving the valve toward and from the plate alternately.

2. The combination, with weighing mechanism involving a load-receiver, of a spout for supplying a stream to said load-receiver; a fixed plate located below and transverse to said spout; a valve for the spout; and means for moving the valve toward and from the plate alternately.

3. The combination, with weighing mechanism involving a load-receiver, of a spout for supplying a stream to said load-receiver; a horizontal plate fixed below said spout; a valve for the spout; and means for moving the valve toward and from the plate alternately.

4. The combination, with weighing mechanism involving a load-receiver, of a spout for supplying a stream to said load-receiver; a plate located below and transverse to said spout; a valve for said spout; and a stream-actuated valve-operating device.

5. The combination, with weighing mechanism involving a load-receiver, of a spout for supplying a stream to said load-receiver; a plate located below and transverse to said spout; a valve for the spout; a stream-actuated device for closing the valve; and independent means for opening said valve.

6. The combination, with weighing mechanism involving a load-receiver, of a spout for supplying a stream to said load-receiver; a plate located below and transverse to said spout; a valve for the spout; means for moving the valve toward and from the plate; and means operating in opposition to said valve-moving means and controlled by the weighing mechanism.

7. The combination, with weighing mechanism including a load-receiver, of a spout for supplying a stream to said load-receiver; a valve for said spout; a stream-actuated device connected with the valve and tending normally to operate the same; means acting in opposition to said stream-actuated device and effective at the commencement of the weighing operation for holding said device ineffective; and means for causing the release of the valve at a succeeding point in the operation.

8. The combination, with weighing mechanism including a load-receiver, of a spout for supplying a stream of material to said load-receiver; a valve for said spout; a stream-actuated device connected with the valve for closing the same; means acting in opposition to said stream-actuating device to hold the valve open; means for effecting the release of said valve at a succeeding point in the operation; and a plate located below and transverse to said spout, said plate coöperating with the valve to control said stream.

9. The combination, with weighing mechanism including a load-receiver, of a spout for supplying a stream to said load-receiver; a plate located below and transverse to said spout; a valve for the spout; means for advancing the valve; and electrically-operated means acting in opposition to said valve-advancing means.

10. The combination, with weighing mechanism including a load-receiver, of a spout for supplying a stream to said load-receiver; a valve for the spout; a stream-actuated device tending normally to advance said valve; a magnet for governing the valve; and means controlled by the weighing mechanism for energizing said magnet at the commencement of the operation, thereby to hold the valve open, and for subsequently deënergizing the magnet to release said valve.

11. The combination, with weighing mechanism including a load-receiver, of a spout for supplying a stream to said load-receiver; a valve for said spout; a stream-actuated device tending normally to close the valve; an electrical circuit including a magnet; a bar connected with the valve and provided with an armature for said magnet; means controlled by the weighing mechanism for closing said circuit at the commencement of the weighing operation, and for opening said circuit when the load is in the load-receiver, thereby to release the valve.

12. The combination, with weighing mechanism including a load-receiver, of a spout for supplying a stream to said load-receiver; a plate located below and transverse to said spout; a valve for said spout; a stream-actuated device connected with the valve for closing the valve; an electrical circuit including a magnet; a bar pivoted to the framework and connected with the valve, and said bar being provided with an armature for said magnet; and means controlled by the weighing mechanism for closing the circuit at the commencement of the weighing operation, and for opening the circuit on the completion of the load.

13. The combination, with weighing mechanism involving a load-receiver, of a spout for supplying a stream to said load-receiver; a valve for said spout; a stream-actuated device normally tending to close the valve; a plate fixed below the spout and aiding the valve in cutting off the supply; an electric circuit including a magnet; a bar connected with the valve and provided with an armature for said magnet; and means for opening and closing the circuit in which said magnet is located.

14. The combination, with weighing mech-

anism involving a load-receiver, of load-discharging means; a spout for supplying a stream to said load-receiver; a valve for said spout; a stream-actuated device normally tending to close the valve; an electric circuit including a magnet; a bar connected with the valve and provided with an armature for said magnet; and means operative with the load-discharging mechanism for opening and closing the circuit.

15. The combination, with weighing mechanism involving a load-receiver provided with a closer, of a spout for supplying a stream to said load-receiver; a valve for said spout; a stream-actuated device normally tending to close the valve; an electric circuit including a magnet; a bar connected with the valve and provided with an armature for said magnet; and means operative with the closer for opening and closing the circuit.

16. The combination, with weighing mechanism involving a load-receiver and with load-discharging means, of means for supplying material to said load-receiver to overload the same; valve mechanism involving a stream-actuated device normally tending to close the valve; an electric circuit including a device for acting in opposition to said stream-actuated device; load-reducing means; and means operative, respectively, with the load-discharging and load-reducing mechanisms for controlling the circuit.

17. The combination, with a spout for supplying a stream of material, of a plate located below and transverse to said spout and serving as a partial cut-off; a valve disposed between the plate and the spout and also acting as a cut-off; and means for moving the valve toward and from the plate alternately.

18. The combination, with a spout for supplying a stream of material, of a plate located below and transverse to said spout; a valve for the spout, situated between the latter and the plate; a device in position to be actuated by the stream and serving to operate the valve; an electric device in opposition to said stream-actuated device; an electric circuit in which said device is located; and means for opening and closing the circuit at different places.

19. The combination, with weighing mechanism involving a load-receiver having a discharge-opening and also having an independent load-reducing opening, of overloading means for said load-receiver; a pair of load-reducing valves mounted at opposite sides, respectively, of said load-reducing opening; means for normally holding said valves closed; connections between the latter for effecting the simultaneous operation thereof; an arm connected to one of the valves; a fixed actuator disposed in the path of said arm and serving to operate the valves before the discharge of the load; and means for subsequently discharging said load.

20. The combination, with weighing mechanism involving a load-receiver having a load-reducing opening, of overloading means for said load-receiver; a pair of valves mounted at opposite sides of the load-reducing opening and normally closing the same, and one of said valves having an angular deflecting portion; means for operating said valves to discharge the surplus; and means for discharging the load.

21. The combination, with weighing mechanism involving a load-receiver, of overloading means for the load-receiver; a pair of load-reducing valves mounted at opposite sides of the load-reducing opening in the load-receiver; connections between said valves for securing simultaneous movement thereof; a weighted arm connected with one of the valves; a resistance device disposed in the path of said weighted arm and adapted to operate said arm, and thereby the valves, when the load-receiver reaches the limit of its movement to permit the surplus to escape; and independent means for discharging the true load.

22. The combination, with weighing mechanism involving a load-receiver having a load-reducing opening, of overloading means for said load-receiver; a pair of superposed valves mounted at opposite sides of the load-reducing opening; connections between the valves for securing the simultaneous movement thereof; means for operating said valves; a latch adapted to hold the valves open; a tripping device operating on the removal of the surplus; and independent means for discharging the true load.

23. The combination, with weighing mechanism involving a load-receiver having a load-reducing opening, of a pair of shafts mounted at opposite sides of said opening and each provided with a valve the valves together being adapted to cover said opening; crank-arms secured, respectively, to the shafts; a link connecting the crank-arms; and a valve-actuator fixed to one of the shafts.

24. The combination, with weighing mechanism involving a load-receiver, of a spout for supplying a stream to said load-receiver; a plate located below and transverse to said spout; a valve for the spout; a plate movably mounted adjacent to the outlet of the spout and adapted to be actuated by the stream flowing from said spout, and connected with the valve for operating the latter; an electrical device acting in opposition to the valve-actuating plate; a closer for the load-receiver; a rocker mounted on the load-receiver; an electric circuit; a circuit-closing device mounted on the rocker; and a latch to engage said rocker.

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Witnesses:
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