

No. 624,379.

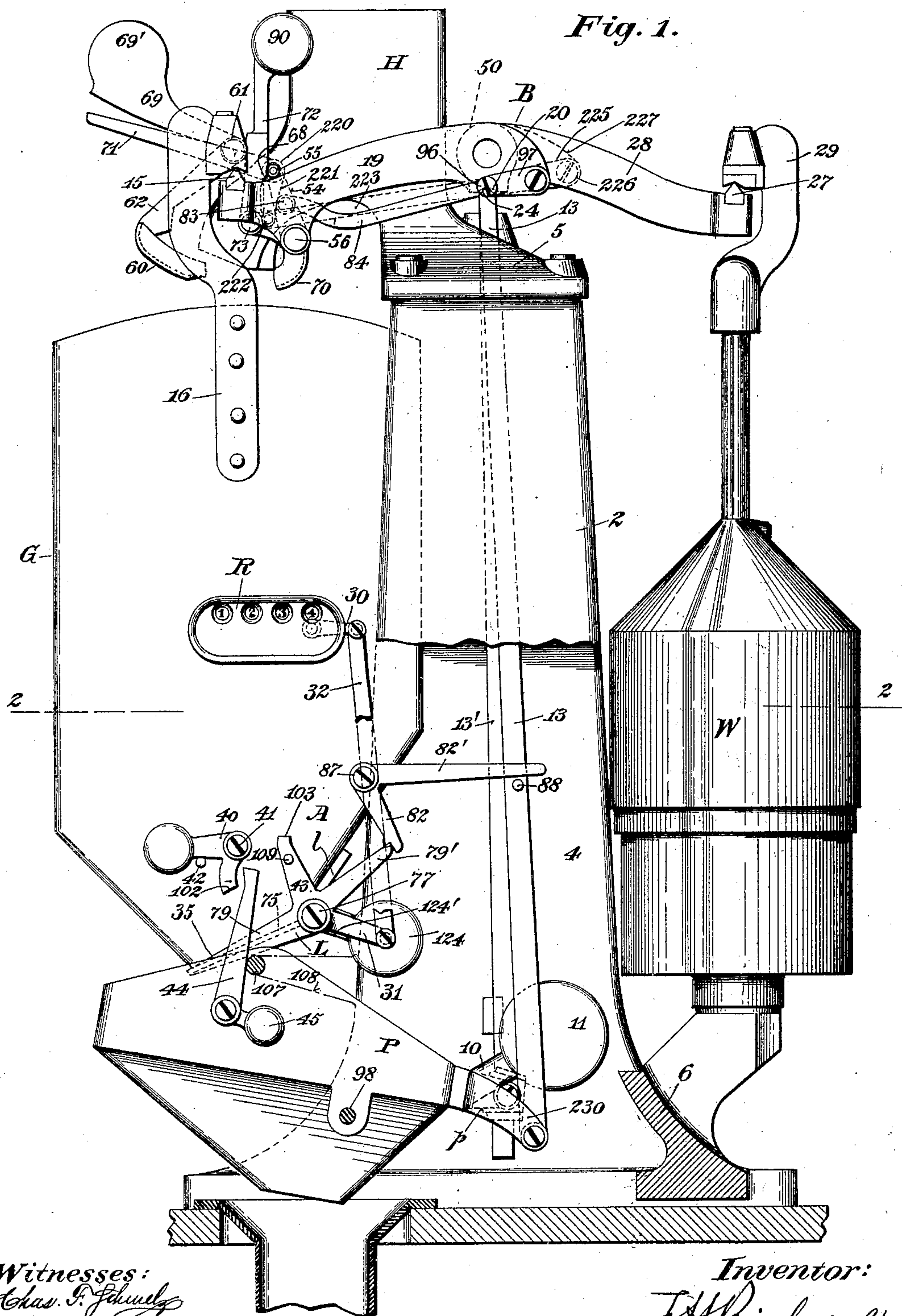
Patented May 2, 1899.

F. H. RICHARDS.
WEIGHING MACHINE.

(Application filed Mar. 17, 1899.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:

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Geo. A. Hoffman

Inventor:

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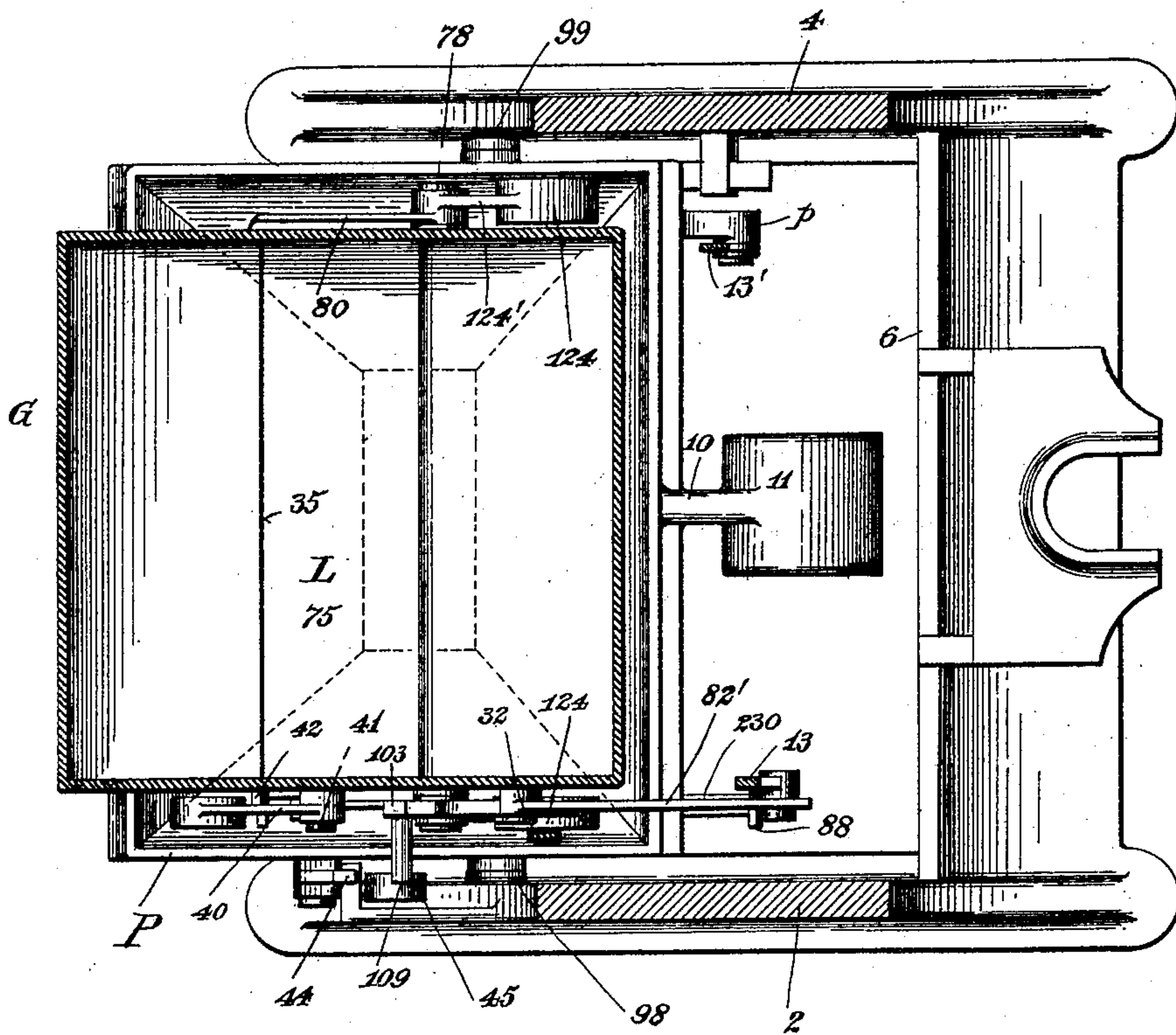
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(No Model.)

3 Sheets—Sheet 2.

Fig. 2.



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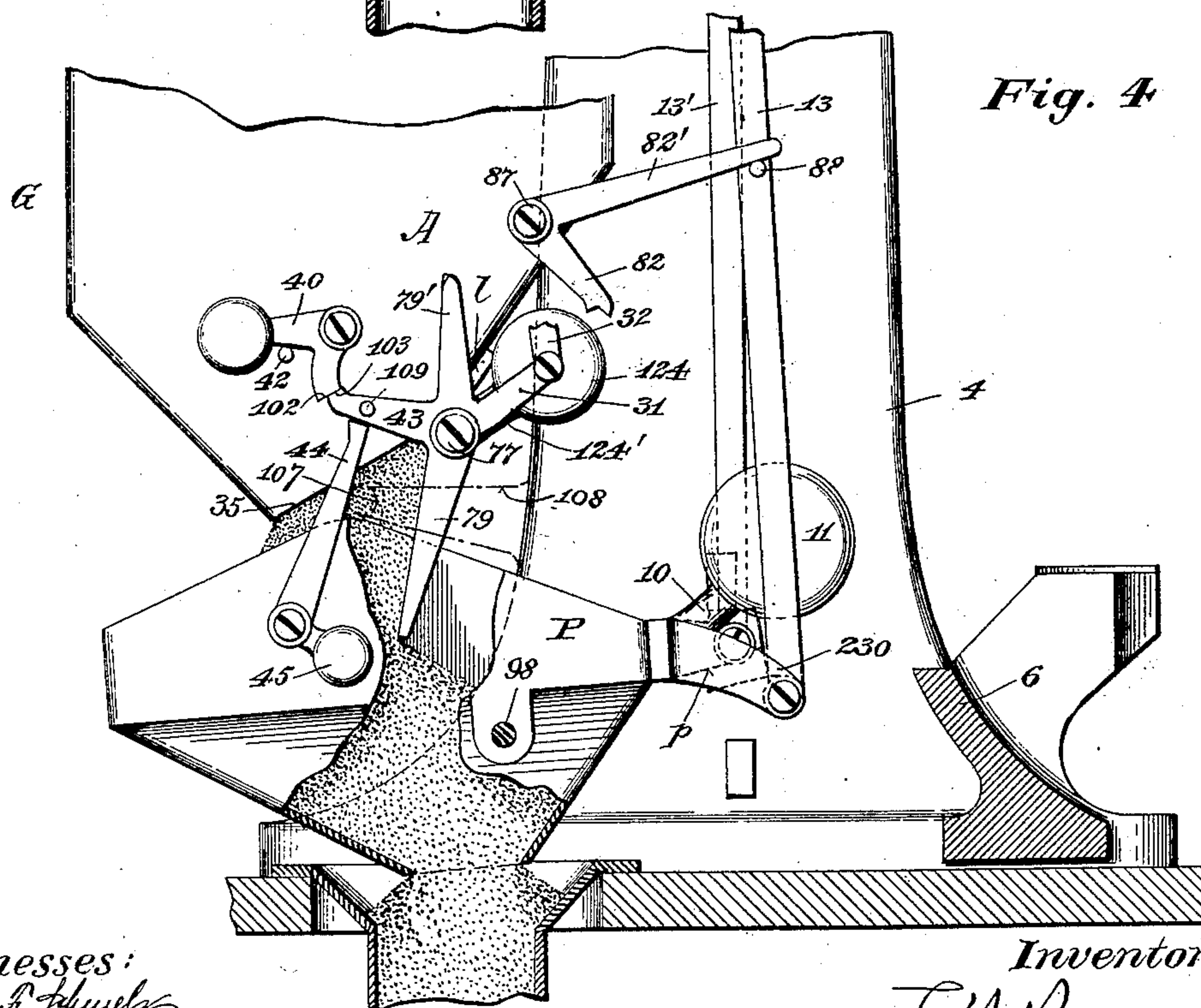
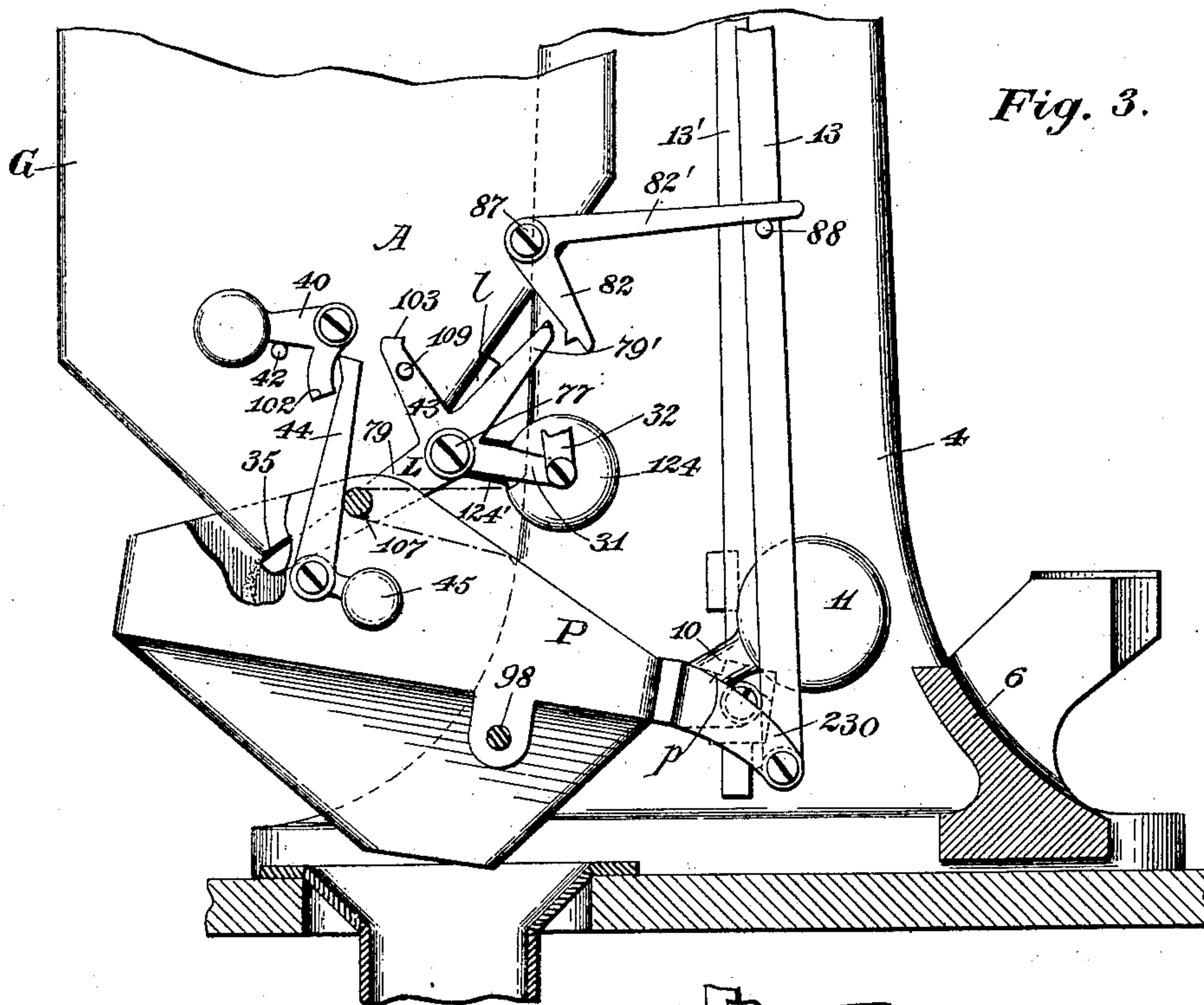
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(No Model.)

3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT.

WEIGHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 624,379, dated May 2, 1899.

Original application filed April 2, 1897, Serial No. 630,352. Divided and this application filed March 17, 1899. Serial No. 709,390. (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, the object thereof being to provide an apparatus comprehending improved load-discharging mechanisms embodying a closer and a regulator and improved means whereby the closer may be locked in its shut position during the loading of the load-receiver, unlocked at the proper time to permit the load-receiver to discharge its completed load, and locked in its open position until the material in said load-receiver and said regulator shall have been discharged, and this application is a division of my application filed April 2, 1897, Serial No. 630,352.

In the drawings accompanying and forming part of this specification, Figure 1 is a side view of my improved weighing-machine, illustrating the parts in the positions occupied by them when a full supply of material is permitted to enter the load-receiver, part of the framework and of the regulator mechanism being broken away. Fig. 2 is a horizontal section on line 2 2, Fig. 1; and Figs. 3 and 4 are views corresponding to Fig. 1 and illustrating the progressive operation of the closer and regulator mechanisms, Fig. 3 representing the parts in the positions which they assume at the instant when the closer is unlocked for the purpose of permitting the load to discharge into the regulator, and Fig. 4 the same parts in the positions which they occupy as the load is discharged into said regulator, the closer being locked in its open position.

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

Comprehended in this weighing-machine are a supply-chute, a load receiver or receptacle and its beam mechanism, and valve mechanism for regulating the supply of material to said load-receiver, all of which parts, if desired, may be similar in construction and arrangement to those described in United States Patent No. 442,719, granted to me December 16, 1890, to which reference may

be had; load-discharging mechanism, (designated in a general way by A,) including a closer for the load-receiver; mechanism comprising a shiftable member of suitable construction for locking said closer in its shut position, and means controlled by the regulator for retaining the closer in its open position until all the material in the load-receiver shall have been discharged therefrom.

The present weighing-machine is an improvement upon that shown and described in United States Patent No. 442,719, above mentioned, and the framework for carrying the operative parts of said machine comprises two uprights 2 and 4, united at their upper ends by the plate 5, supporting a supply-chute H and connected at their lower ends by the tie 6.

The load-receiver G may be of any desired construction and is shown as suspended under the supply-chute H by hangers 16, which are fixed to the bucket and are supported by V-shaped bearings on the pivots or knife-edges 15, which form a part of the scale-beam B, said beam consisting of two arms 19, one on each side of the chute H, and having a rearward extension 28 for supporting the main weight W.

The beam B has V-shaped bearings 20, one at each end of a hollow shaft 50, which rests on pivots or knife-edges 24, suitably supported on the top plate 5. The rearwardly-extending arm 28 is provided with a pivot or knife-edge 27, on which the main weight W is suspended by a hook 29.

The bucket-closer L consists of a suitably-formed plate 75, having end flanges or arms 79 and 80 usually formed integral therewith, which are pivoted at 77 and 78, respectively, to the load-receiver G. Said plate 75 is formed to hold the material within the load-receiver and to prevent any leakage therefrom without requiring close fitting of said parts, the flanges 79 and 80 overlapping the end of the load-receiver when the closer is shut.

The valve mechanism for regulating the supply of material to the bucket is herein shown as comprising a pair of swinging or oscillatory valves, one operable to reduce the flow of such material, and therefore designated as a "reducing-valve" 60, and the other oper-

able to cut off such flow completely, and therefore designated as a "cut-off" valve 70. Each of these valves comprehends a blade provided with arms 62 and 72, respectively, (one at each end thereof,) the arm 62 of the reducing-valve 60 being shown fixed to a rock-shaft 61, supported in bearings on chute H, while the arms 72 of the cut-off valve 70 are pivoted at 73 on said chute.

The reducing-valve 60 is provided with an outwardly-extending valve-lever 69, which is operated by the scale-beam B and also by the regulator-hopper through the arm 71 on said scale-beam and connections hereinafter described, the valve-lever 69 being equipped with a weight 69' either integral therewith or attached thereto. The beam-arm 71 is fixed to the short rock-shaft 220, journaled in suitable bearings formed on one of the bucket-supporting arms 19 of the scale-beam, and a short arm 221 is likewise fixed to the outer end of said rock-shaft 220 and is pivotally attached, as at 222, to one end of a link 223, the opposite end of which is pivoted to an arm 225, pivotally connected, as at 226, to a projection 227, formed on the scale-beam. A vertical actuator-rod 13' has its upper end connected to both the link 223 and the arm 225, and its lower end is attached to a rearwardly-extending arm p of the regulator-hopper P. Said hopper P is pivoted at 98 and 99 to the framework and has an arm 10 fixed thereto, equipped with the usual counterweight 11, sufficient to raise the regulator, and thereby through the connections described open the valves when said regulator is empty.

The cut-off valve 70, which, as before stated, is carried by the arms 72, pivoted at 73 to the sides of the chute H, has one of said arms formed with a cam-face 68, and said arm continuing upward is provided with a suitable weight 90. This cam-face 38 is successively actuated during the closing of the reducing-valve, during the poising period of the load-receiver, and during the final action of the cut-off valve.

The cut-off-valve actuator comprises a small roller 55, carried by an arm 54, pivoted at 56 to one of the arms 19 of the scale-beam B, and attached to this actuator-arm 54, as at 83, is a connecting-rod 84, the opposite end of which is pivoted at 96 to an arm 97, which latter is articulated to a projection forming a part of the scale-beam B.

Pivotally secured to the link 84 and the arm 97 at their connecting-point is a valve-actuating rod 13, the lower end of which is also pivotally secured to a rearwardly-extending arm 230 of the regulator-hopper P, so that the regulator on its oscillatory movements causes both of the arms 225 and 97, and thereby the links 223 and 84, to be actuated in a manner similar to toggle-joints and the valve-actuator arm 54 to be shifted from its operative to its inoperative position by the downward movement of said hopper.

From the foregoing it will be understood that when the load-receiver (in the position shown in Fig. 1) descends to its poising position the bucket-carrying arms 19 of the scale-beam B likewise descend, carrying with them the beam-arm 71, thus permitting the fall of the weighted lever 69 and a reduction, by the closing of the valve 60, of the flow of material into said load-receiver. As the bucket receives its true load it descends below the poising-line and the valve-actuator 55 is withdrawn into position to permit the closing of the cut-off valve 70 by means of its weighted arm 72, whereby the supply of material to the bucket is completely cut off.

The closer mechanism, which, as before stated, forms a part of the load-discharging mechanism, (designated generally by A,) comprehends a closer or shiftable member and means for locking said closer in its shut position and, furthermore, means for positively locking the closer in its open position during the discharging period of the material from the load-receiver, and which controlling mechanism in the preferred construction comprises two latches, one operative to lock the closer shut and the other to lock the same open.

In the form shown and described the closer is pivotally secured to the load-receiver by means of brackets l, whereby said closer is in position to operate at the discharge opening or spout 35, as is clearly shown in Fig. 4 of the drawings.

In order that the closer may be self-operating to return to its normal or shut position after the discharge of the material from the load-receiver, I provide a weight 124, carried at the free end of a rearward extension 124' of one of the arms, as 80, of said closer, and which weight will be sufficient to overbalance and quickly shut the closer after the same has been released; but said weight being insufficient to counterbalance the load in the load-receiver, suitable locking mechanism is provided, which constitutes a part of the closer-controlling means above mentioned and which comprehends a latch, as 82, of desired form, shown pivotally secured to one side of the load-receiver, as at 87, and adapted to engage a catch-arm 79', forming a part of the closer, and thereby to retain the same in its shut position. The latch 82 forms part of an angle-lever, the other branch 82' of which is in position to be engaged by an actuator, shown in the nature of a pin 88, carried by the upright valve-actuator 13, connected to the regulator.

When the closer is unlocked at the proper time—i. e., at the completion of the load in the load-receiver—it is preferable in practice to lock the same in its open position, so as to afford an opportunity for all the material to pass out of the bucket before the closer is again shut and a new supply is permitted to enter the load-receiver from the chute or hopper H. For this purpose I have provided on the load-receiver an oscillatory weighted

locking-lever 40, pivoted at 41 to the side of the bucket and held in operative position by a suitable stop-pin 42, carried by said load-receiver, and which locking-lever is shown as having an inclined face 102 in position to engage a similar face 103 of the closer catch-arm 43, whereby on the opening of the closer the end of such arm 43 is carried below the end of said locking-lever, and consequently locked thereby, as shown in Fig. 4.

In order to liberate the closer and permit it to shut after all the material has been discharged from the bucket, it is necessary to provide means which will insure the release of the arm 43 from said locking-lever or latch 40, such release taking place on the ascent of the empty regulator-hopper after most of the material has been discharged therefrom. For this reason an actuator 44, shown as a pivoted pawl, is shiftably carried by the regulator-hopper and has a counterbalancing-weight 45, arranged to swing the actuator toward the pivot of the closer, such movement being limited by a suitable stop 107, carried in this instance by a projecting arm 108 on the side frame 2, whereby on the return of the hopper such actuator directly engages the closer by means of a stud or pin 109, carried on the above-mentioned closer-arm 43, thus forcibly moving the same upward and causing it to pass (on account of the inclined faces 102 and 103) the locking-lever or latch 40 until such inclined faces are disengaged, thereby releasing the closer and permitting the closer-weight 124 to perform its function of returning the closer to its normal or shut position, whereupon the locking-lever 40 will return to its normal and inoperative position. It will thus be seen that in my improved machine the actuator not only unlocks the closer from its locked position when open, but also simultaneously therewith assists in shutting the same.

From the foregoing it will be understood that the shutting of the closer is controlled by the regulator-hopper P and also that the opening of the closer is indirectly regulated thereby and in such a manner that when the regulator-hopper is in its normal stationary position the actuator 88 on rod 13 operates to unlock the closer from its closed position by releasing the latch-arm 82', which strikes the same on the descent of the bucket, and that when said hopper is moving into or toward such normal position it is effective to unlock the closer when open to permit the same to shut.

As will be obvious, the pivoted pawl or lever 44 will on the downward movement of the regulator-hopper P pass by without actuating the latch or locking-lever 40 and will be brought substantially to the position shown in Fig. 4 in readiness to engage with and positively actuate the closer to assist the same in its closing movement on the upward movement of the hopper, as before set forth.

In connection with the weighing mechan-

ism above described I employ a register, such as R, by which every consecutive load is recorded as it is discharged from the load-receiver. In Fig. 1 of the drawings the initial operating-lever 30 of the register R is represented connected with an arm 31, which may form a part of the closer-plate 75, such connection being had by means of a connecting-rod or pitman 32, as indicated in Fig. 1. As the closer opens the lever 30 will be swung upward and the register will record each consecutive load; but should the register be out of order or so impeded in the movements of its recording mechanism that it will not properly operate it will prevent the opening movement of the closer to discharge the load and will also prevent the operation of the valve mechanism by the regulator through the connections described in the manner set forth. In other words, the parts will be held in the positions they occupy after the bucket or load-receiver has passed the poising-line, and the supply-valves, which are then closed, will not be permitted to reopen until the defect in the register has been remedied. This register is of a well-known kind and has been long in use upon what are known as the "Pratt & Whitney" weighing-machines. It is also shown connected with the closer in substantially the manner above set forth in various patents of the prior art, and it has been in public use and on sale in this country for many years. Therefore said register and the connections therefrom to the closer of the load-receiver constitute, by themselves considered, no part of my invention.

Many details of the closer locking and releasing mechanism may be largely varied without departure from my invention, and the invention is not restricted to the pivoted latch and locking-lever shown, for, as is obvious, other devices operating in a different manner may be readily substituted therefor. No claims are herein made to combinations including a load-receiver provided with a member shiftable to discharge the load, locking means located and operable for locking said member in its load-discharging position, a load-receiving regulator shiftable in one direction by the discharging load, and a device located and connected to have descending and ascending movements with the regulator and thereby operable to engage and unlock said member when this is in its load-discharging position and on the ascending movement of said device and the regulator, for such broad subject-matter is covered by my application filed April 2, 1897, Serial No. 630,352, above mentioned.

Having described my invention, I claim—

1. The combination, with a load-receiver, of a shiftable closer; means for locking the closer in its open position; a regulator; and means coöperative therewith for releasing the closer from said open position and for assisting the same to shut.

2. The combination, with a load-receiver, of a shiftable closer; means for locking the closer in its shut position; means for locking the closer in its open position; a regulator; and means operative therewith and adapted to unlock the closer from said open position and also positively to assist the same to shut.

3. The combination, with a load-receiver, of a shiftable closer; a latch for locking said closer in its shut position; means for locking the closer in its open position; a regulator; and a pivoted device carried by said regulator and adapted to unlock the closer from said open position and also positively to assist the same to shut.

4. The combination, with a load-receiver, of a shiftable closer having catch-arms; means coöperative with one of said arms to latch the closer in a shut position; means coöperative with another arm to lock the closer in an open position; and a movable device for releasing the closer from its open position and for positively assisting the same to shut.

5. In a weighing-machine, the combination, with a load-receiver, of a shiftable closer therefor, said closer being provided with two catch-arms; a pivoted latch for engaging one of said arms and locking the closer in its shut position; a pivoted locker for engaging the other arm and locking the closer in its open position; a regulator; and a pivoted device carried by said regulator for releasing the closer from its open-lock position and for positively assisting the same to shut.

6. In a weighing-machine, the combination, with a load-receiver, of a supply-hopper and valve mechanism for regulating the discharge of material therefrom to said load-receiver; a closer shiftable mounted on the load-receiver; a latch for locking the closer in its shut position; a second latch for locking the closer in its open position; a regulator; means carried by said regulator for releasing the closer from its open position and for positively assisting the same to shut; and means controlled by the regulator for actuating the valve mechanism.

7. In a weighing-machine, the combination, with a load-receiver, of a shiftable closer; a register connected with said closer; means for locking the closer in its shut position; means for locking the closer in its open position; a regulator; a device carried thereby for releasing one of the closer-locking members and for positively assisting the closer to shut; valve mechanism for controlling the supply of material to the load-receiver; and means controlled by the regulator for actuating said valve mechanism, the construction being such that if the register should fail to operate the closer cannot open and the operation of the machine will therefore be stopped.

8. In a weighing-machine, the combination, with a load-receiver, of a counterpoised closer having two latch-arms; a register connected with said closer; means engaging one of said latch-arms for locking the closer in its shut

position; means engaging the other of said latch-arms for locking the closer in its open position; a regulator; a pivoted pawl carried by said regulator and adapted to unlock the closer and positively assist the same to shut; valve mechanism for regulating the supply of material to the load-receiver; and means controlled by the regulator for actuating said valve mechanism.

9. In a weighing-machine, the combination, with a load-receiver and with valve mechanism for regulating the supply of material thereto, of a shiftable closer; means for latching said closer; a regulator carrying a device for releasing the closer-latch and for also positively assisting the closer to shut; a register on the load-receiver connected with an arm of the closer; and means controlled by the regulator for actuating the valve mechanism of the machine.

10. In a weighing-machine, the combination, with beam mechanism, of a load-receiver supported thereby; valve mechanism for governing the supply of material to said load-receiver; a shiftable closer for the load-receiver; a latch for locking said closer in its shut position; a device for locking said closer in its open position; means for releasing said latch and said device at the proper times; a regulator carrying the device for releasing the closer from its shut position; and means connected with said regulator for actuating the valve mechanism.

11. The combination, with weighing mechanism embodying a load-receiver provided with a closer shiftable for discharging the load, of controlling means carried by the load-receiver and adapted to lock the closer shut; controlling means to lock said closer open; and regulating mechanism embodying an actuator-pawl adapted to actuate a part of said controlling means and thereby unlock the closer from its open-lock position and permit the same to shut.

12. In a weighing-machine, the combination, with beam mechanism, of a load-receiver supported thereby; valve mechanism for controlling the supply of material to said load-receiver; a shiftable closer for said load-receiver; a register carried by the load-receiver and connected with said closer; means for locking the closer in its shut position; independent means for locking said closer in its open position; a regulator; a device carried thereby for releasing the means for holding the closer open, said device serving positively to assist said closer to shut; and connections between said regulator and valve mechanism.

13. In a weighing-machine, the combination, with a reciprocatory load-receptacle provided with a shiftable closer, of a regulator-hopper having a pair of actuators connected therewith; and a controlling instrumentality mounted on the load-receiver and comprehending a plurality of lockers adapted to lock the closer in its open and in its closed positions, one of said lockers having an arm or

projection in position to be engaged by one of the actuators connected with the regulator-hopper on the descent of said load-receiver with its load, and the other of said lockers also having an arm or projection in position to be actuated by the other actuator connected with said hopper, thereby to permit the closer to shut.

14. The combination, with a load-receiver provided with a closer, of supply-valve mechanism therefor; a regulator operable in one direction by the discharge of the load; means operatively connecting said valve mechanism with said regulator; means for locking the closer shut; means for locking the closer open; means carried by said connecting mechanism and in position to unlock the closer to permit the same to open on the movement of the load-receiver in one direction; and means carried by the regulator and operative therewith to unlock the closer from its open-lock position to permit the same to shut.

15. The combination, with a load-receiver provided with a closer shiftable for discharg-

ing the load, of means for locking the closer in its open position; and regulating mechanism operative therewith and adapted to unlock said closer and also positively assist the same to shut at a predetermined period in the operation of the mechanism.

16. In a weighing-machine, the combination with beam mechanism of a bucket carried thereby; closer mechanism, comprising an oscillatory closer and a latch therefor; an oscillatory regulator-hopper disposed below said bucket and operable by the discharge therefrom; and the herein-described pawl pivotally supported on said hopper and operative to engage and actuate a part of the closer mechanism on the upward movement of the hopper, and thereby cause the shutting and latching of the closer, substantially as described.

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Witnesses:

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