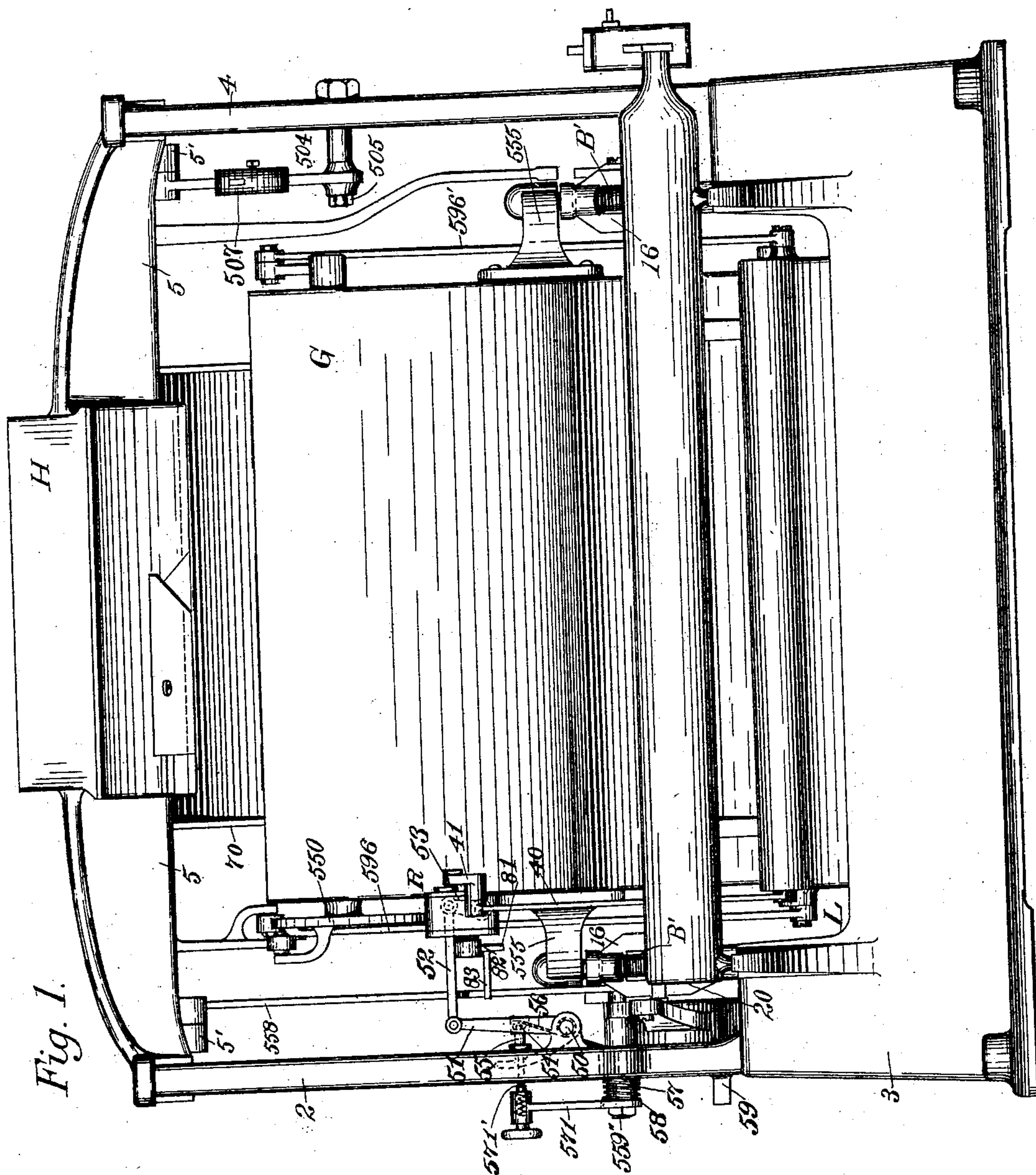


(No Model.)

F. H. RICHARDS.
WEIGHING MACHINE.

Patented Oct. 29, 1895.

No. 548,854.



Witnesses:
R. W. Pittman
Fred. J. Dole.

Inventor:
F. W. Richards.

(No Model.)

4 Sheets—Sheet 2.

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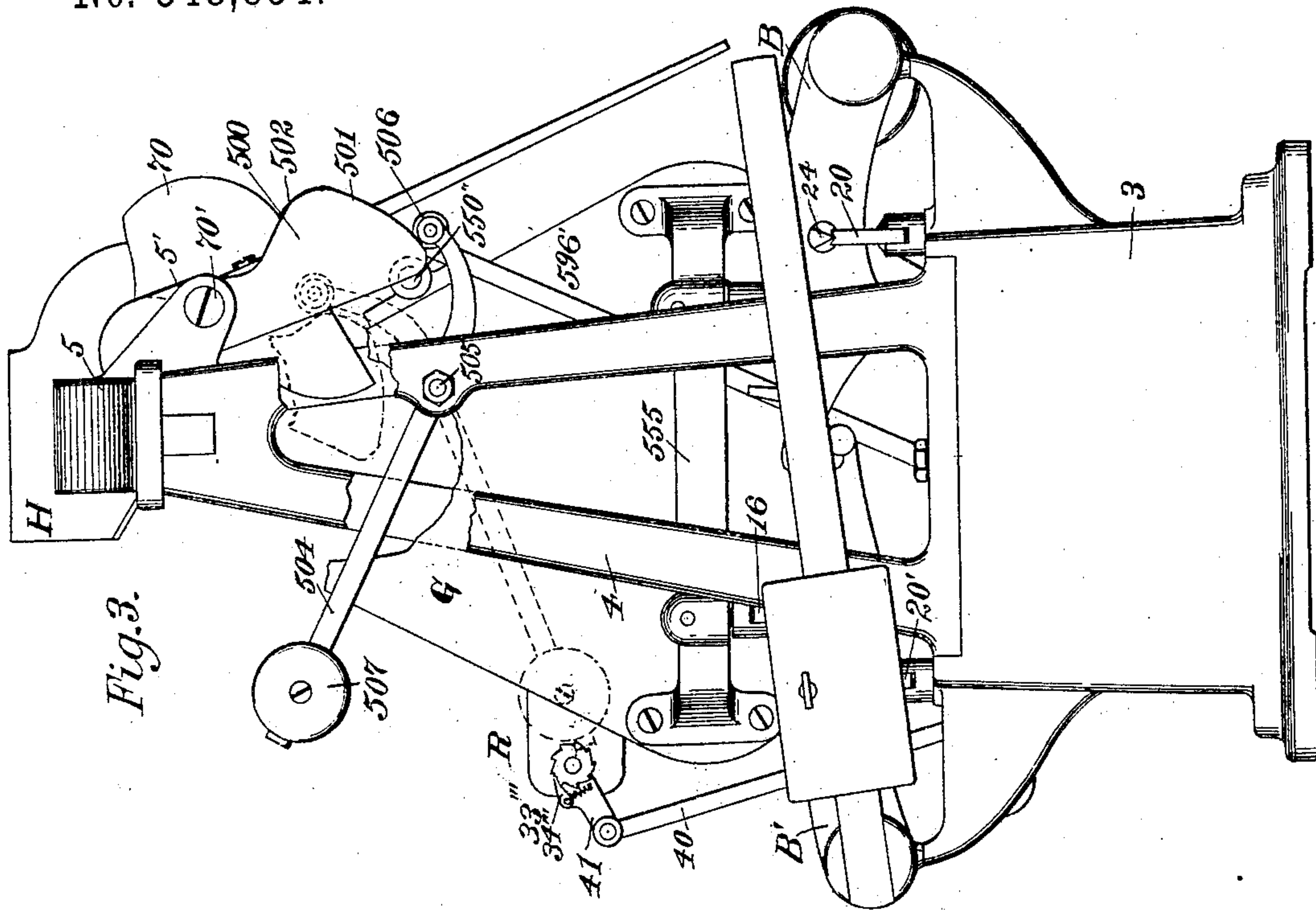


Fig. 3.

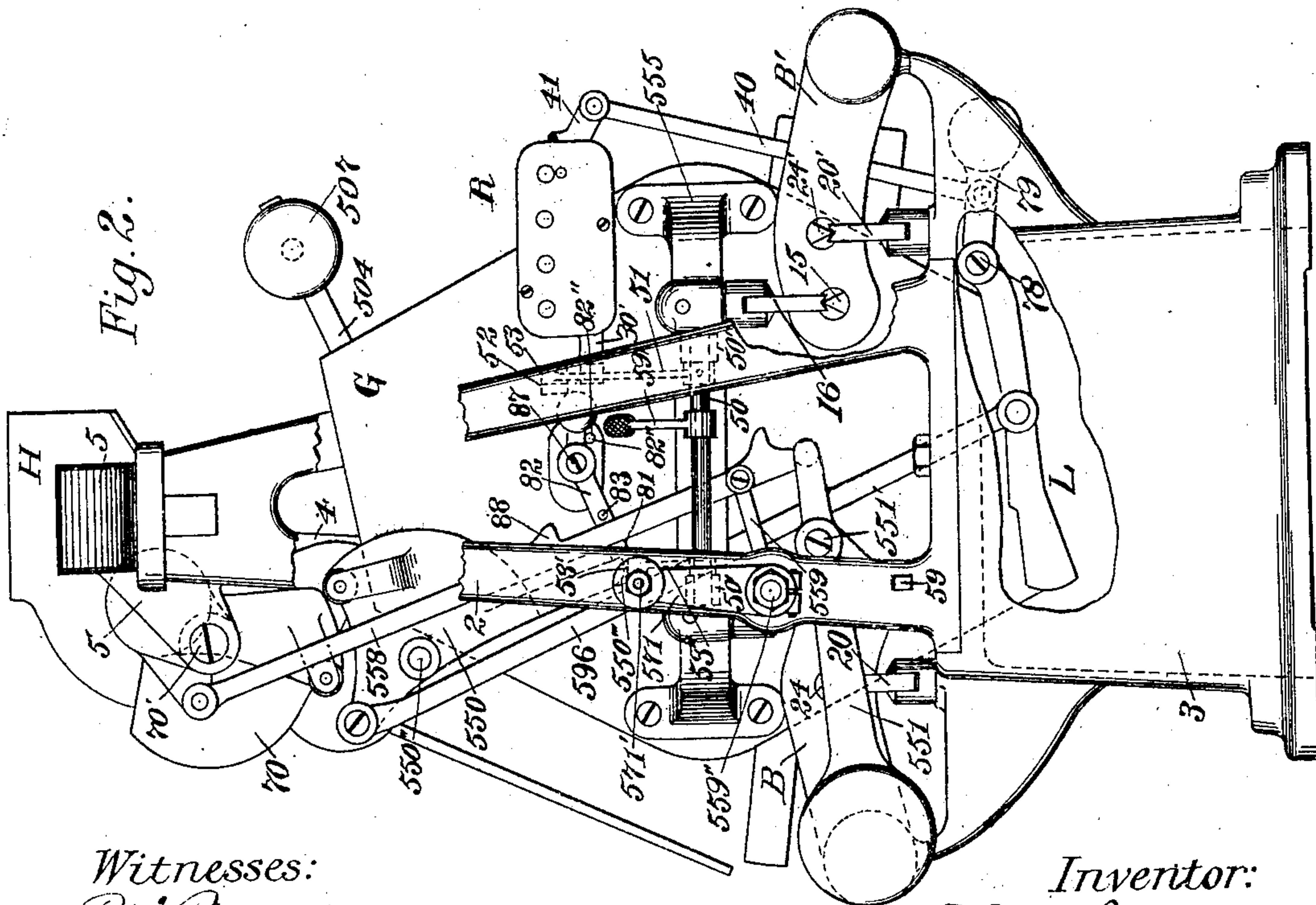


Fig. 2.

Witnesses:
R. W. Pittman
Fred. J. Dole

Inventor:
J. A. Richards.

No. 548,854.

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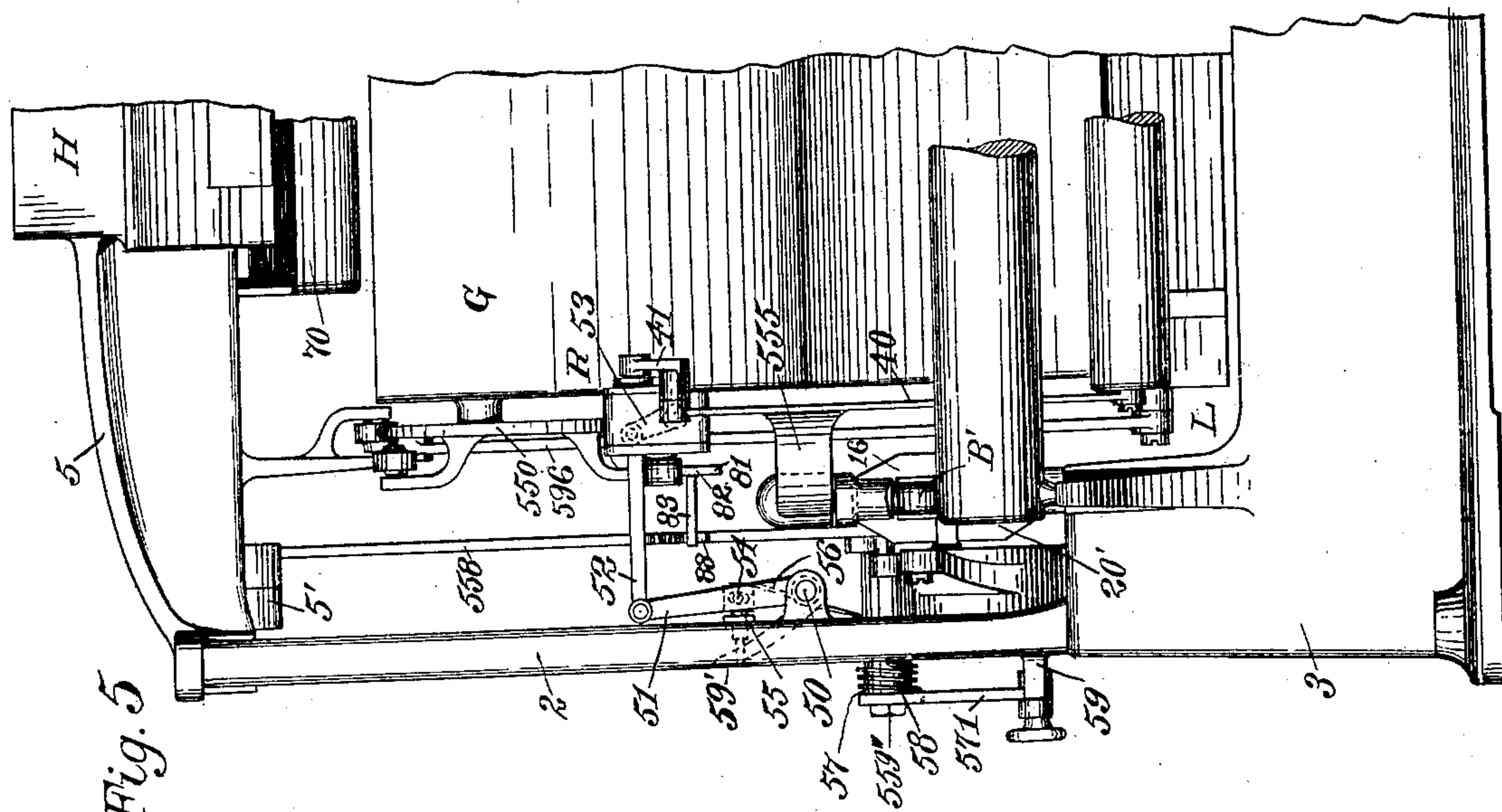


Fig. 5

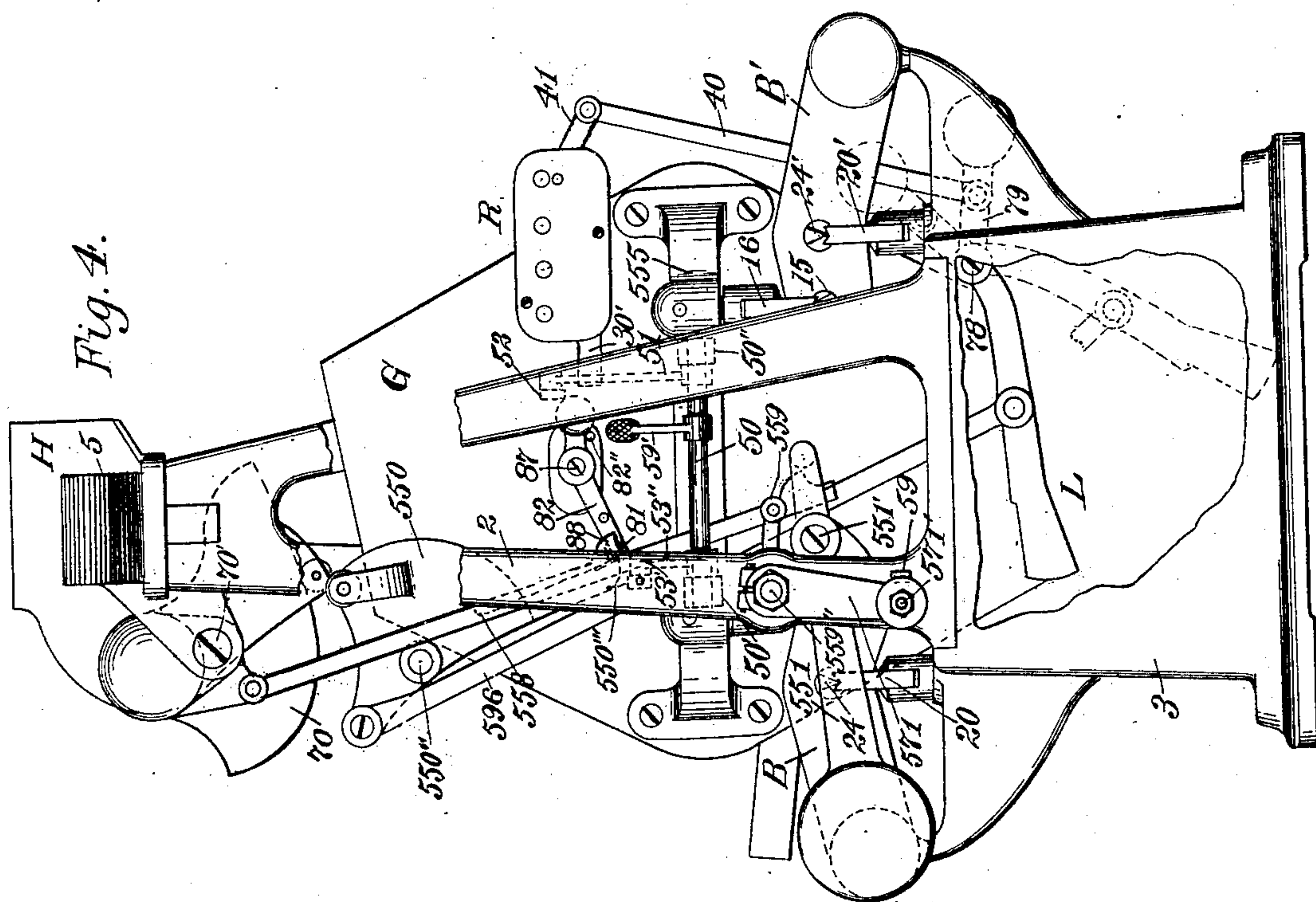


Fig. 4.

Witnesses:
R.W. Pittman
Fred. J. Dole.

Inventor:
J. H. Richards.

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Fig. 9.

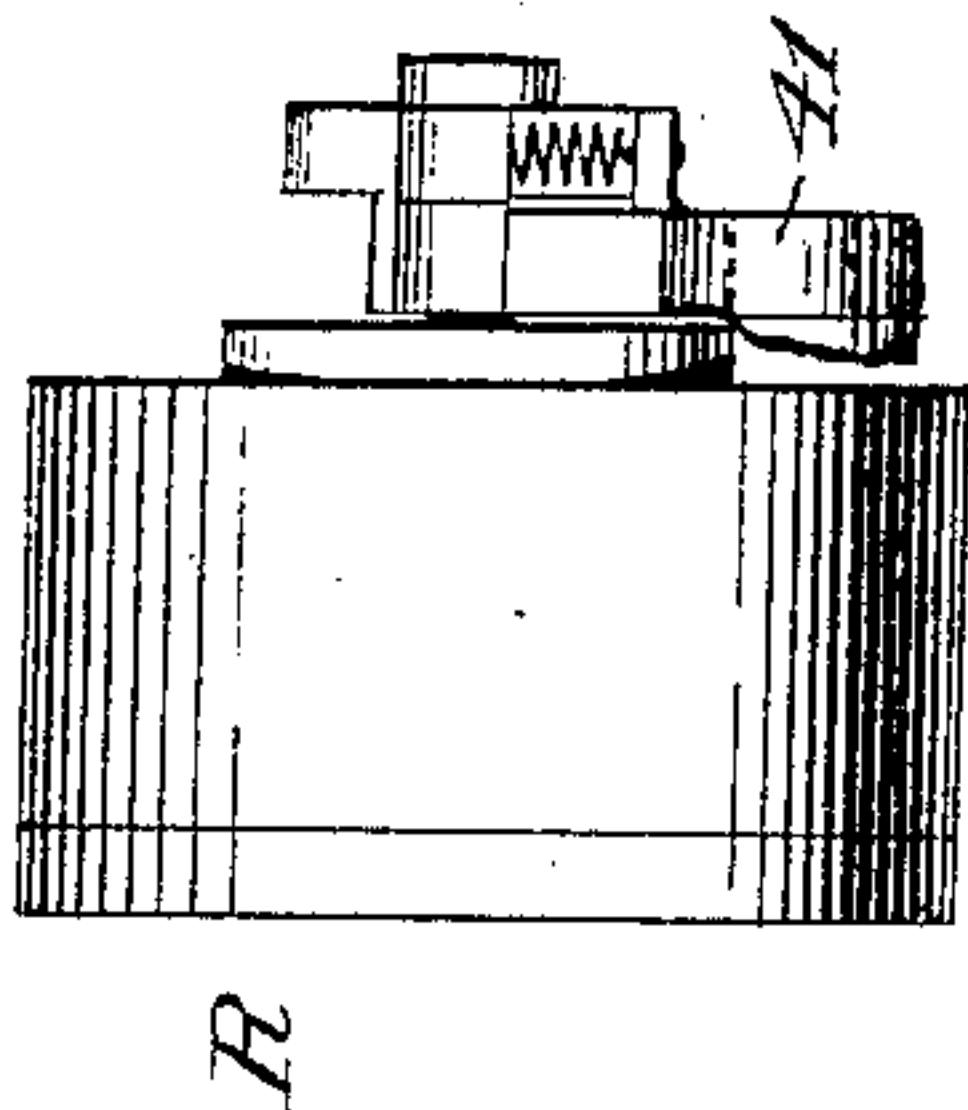


Fig. 10.

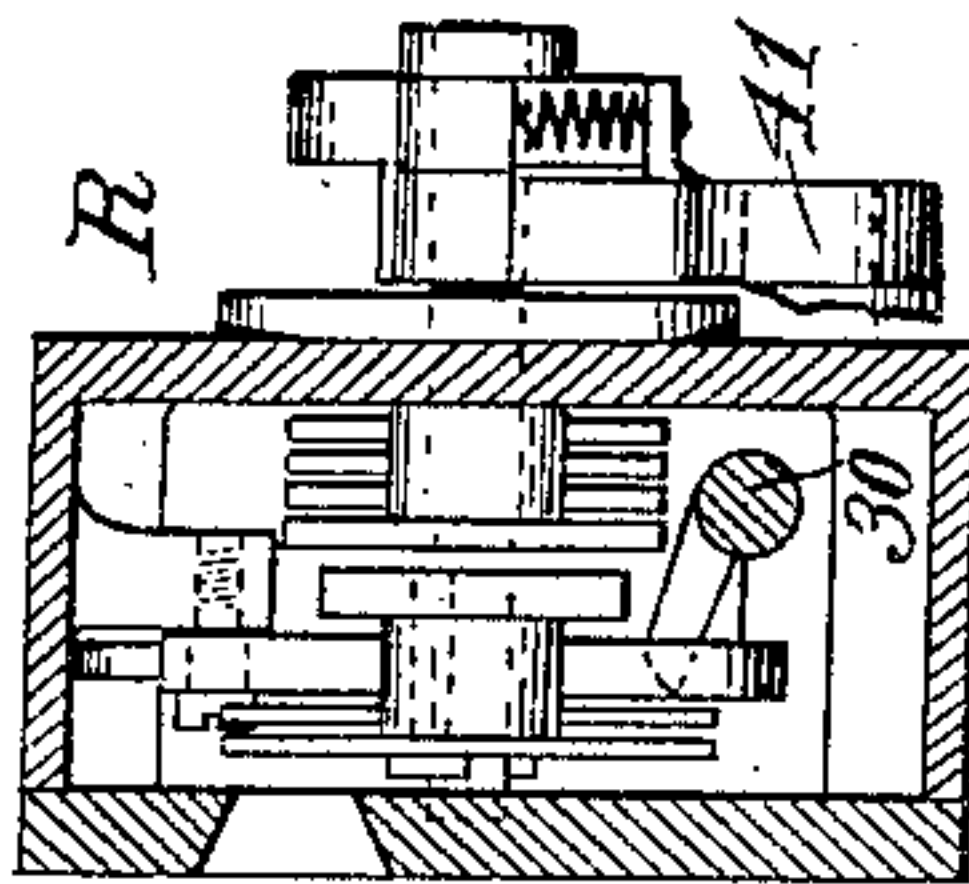


Fig. 6.

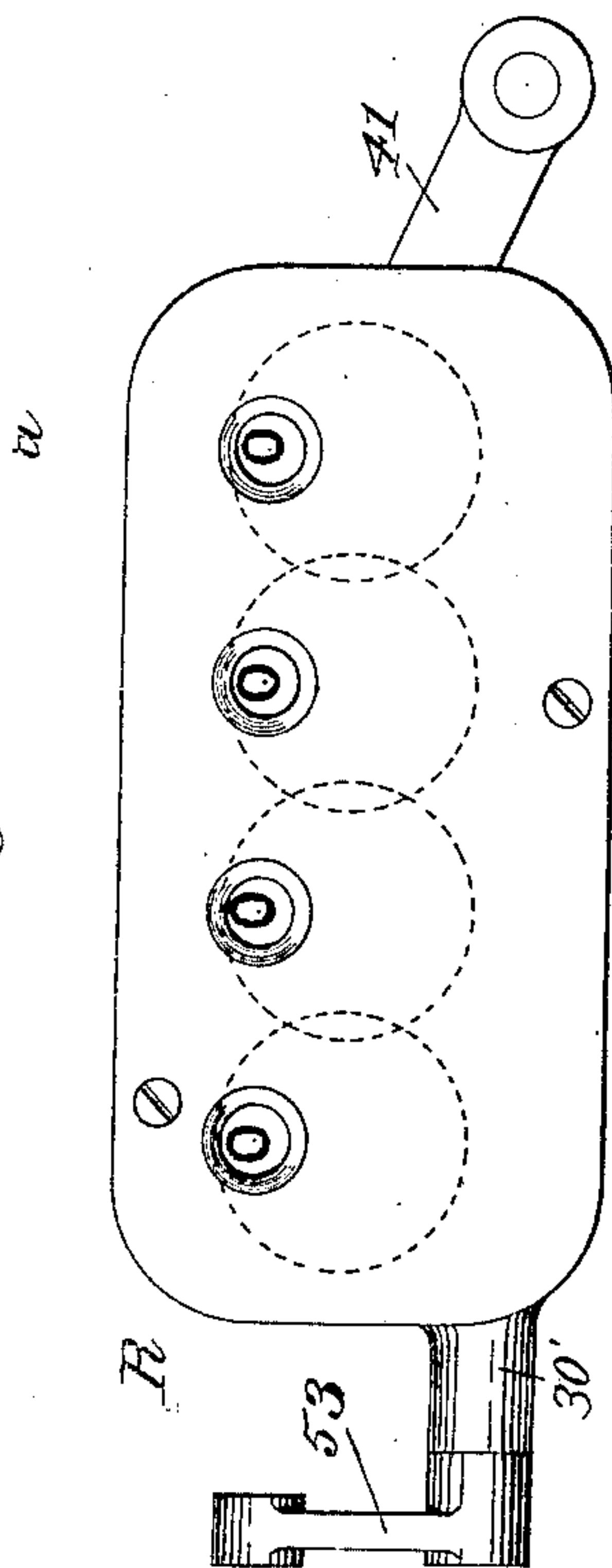


Fig. 7.

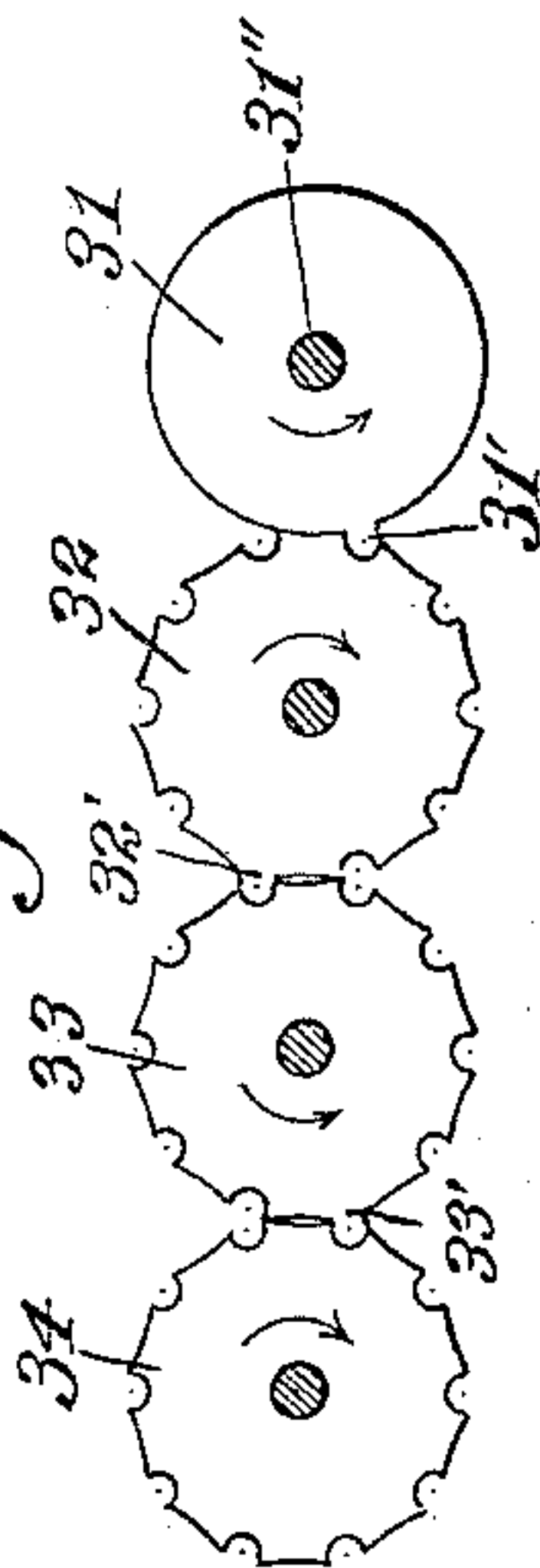
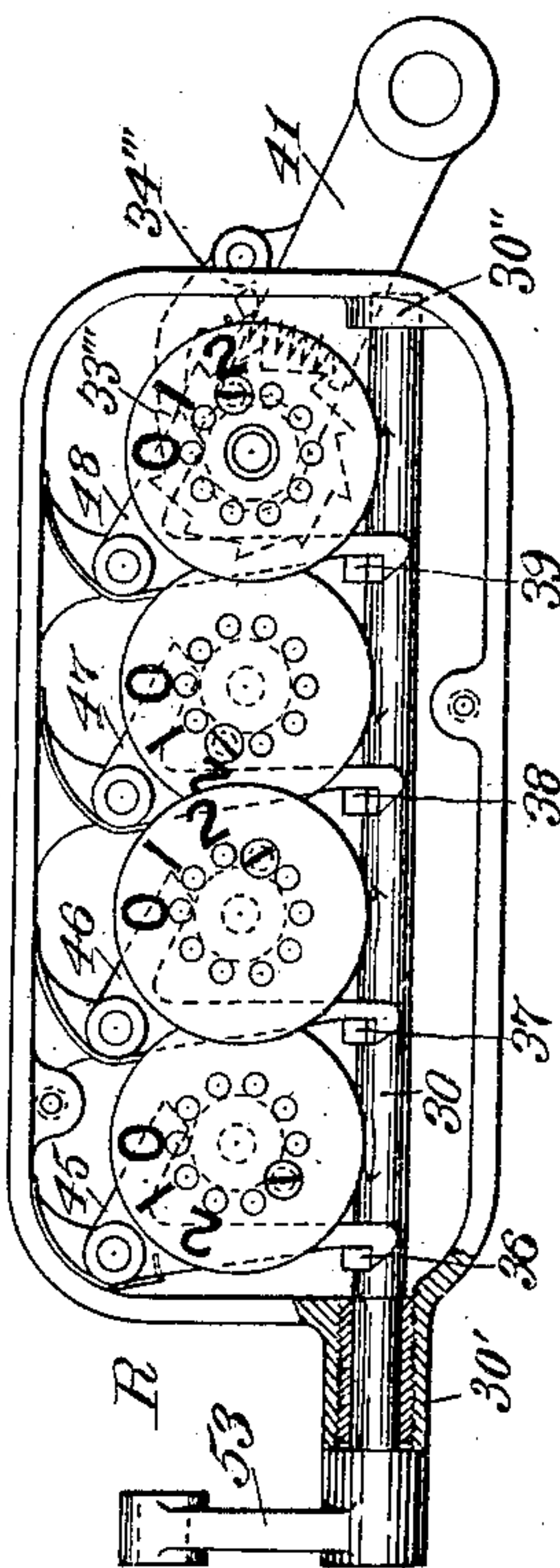


Fig. 8.



Witnesses:
R. W. Pittman
Fred. J. Dole.

Inventor:
F. H. Richards.

UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT.

WEIGHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 548,854, dated October 29, 1895.

Application filed August 5, 1895. Serial No. 558,200. (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, and especially to the load-registering mechanism thereof, the object being to provide improved apparatus or mechanism operable, in connection with a stop-register, for automatically stopping the operation of the weighing-machine when this has delivered a predetermined number of loads, and especially to furnish such an apparatus or mechanism adapted for operation in connection with the improved single-bucket automatic weighing-machine described in my concurrently-pending application, Serial No. 541,087, filed March 9, 1895. In the mechanism herein shown and described a shiftable member of the stop-register is co-operatively disposed relatively to a valve-opening actuator of the weighing-machine and is adapted immediately when released to render the valve-opening actuator ineffective for opening the valve and thereby stopping the operation of the machine.

In the drawings accompanying and forming part of this specification, Figure 1 is a front elevation of a weighing-machine, showing a stop-register and a portion of the mechanism operatively connecting the shiftable member thereof with the valve-opening actuator. Fig. 2 is an end elevation of the same, seen from the left in Fig. 1, and shows the valve-opening actuator in an effective position for opening the valve. Fig. 3 is an end elevation seen from the right in Fig. 1 and shows the valve-closing actuator at the commencement of the valve-closing period, and also shows a portion of the register. Fig. 4 is a view similar to Fig. 2, the valve-opening actuator being shown ineffective for opening the valve, the latter being shown closed. Fig. 5 is a front elevation of a portion of the weighing-machine illustrated by Fig. 1 and shows the parts in substantially the same positions these are shown occupying in Fig. 4. Fig. 6 is an enlarged detail showing the register, its actuating-lever, and also a crank-arm

operable by the shiftable member of the register. Fig. 7 is a detail view showing a train or series of register actuating-gears. Fig. 8 is a view of the registering mechanism with the face or front plate thereof removed to better illustrate the construction of the register mechanism. Fig. 9 is a detail view of the register, seen from the right in Fig. 6; and Fig. 10 is a partial cross-sectional view taken in line *a a*, Fig. 6, and seen from the left in said Fig. 6.

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

For convenience in illustrating the nature and purpose of the present invention this is shown applied to a weighing-machine substantially similar to that described and claimed in my concurrently-pending application, Serial No. 545,878, filed April 16, 1895, and this weighing-machine will be described briefly, but with sufficient particularity to clearly illustrate the operation of the invention.

The framework for carrying the operative parts of the machine is shown in the drawings, comprising two side frames or uprights 2 and 4, mounted upon a chambered supporting-base 3 and connected by a top plate 5, to which a suitable hopper, such as H, is shown secured by some suitable fastening means. The base 3 is shown as carrying some suitable beam-supports, such as the V-shaped bearings 20 and 20', for supporting the scale-beams, which carry the bucket mechanism consisting of the bucket and its operative devices.

As a means for supporting the bucket or load-carrying receptacle, (designated in a general way by G,) a pair of oppositely-disposed counterweighted beams are shown at B and B', respectively, pivotally mounted upon beam-supports—as, for instance, by means of a pair of pivots or knife-edges 24 and 24'—and as having bucket-supports located intermediate of said beam-supports, which are shown in the drawings as the pivots or knife-edges 15, carried by the scale-beams B and B', respectively.

The bucket G is shown provided with hangers 555, which in turn are shown carrying the V-shaped bearings 16, which are adapted to rest or to be supported by the pivots or knife-edges 15 of the scale-beams.

It will be evident that the beam mechanism has, as usual, poising and counterpoising portions. All that portion of the beam-arms and the bucket which lies between the beam-

5 supports constitutes the poising portion and all that portion of the beam mechanism which lies outside of said beam-supports constitutes the counterpoising portion of the beam mechanism.

10 The bucket mechanism has two members, one of which is shiftable relatively to the other for discharging the load, and the closer L is shown constituting the shiftable member of the bucket mechanism. The closer L

15 is illustrated pivoted at 78 to the lower rearward side of the bucket and provided with a rearwardly-extending counterweighted arm 79, which is preferably formed integral therewith.

20 As a means for supporting the closer L, an inverted toggle connection is shown in the drawings connecting the closer and bucket, and this toggle connection is so positioned as to be engaged by a closer-latch when the latch is in

25 its operative position and the closer is shut. In the form thereof herein shown the toggle connection comprises some suitable rocker—for instance, as 550—pivoted adjacent to the

30 upper rearward side of the bucket and having a long connecting-rod 596, pivoted, respectively, to the rocker and to the closer in such a manner that when the closer is shut the

35 two pivots of said connecting-rod or toggle member will be nearly in line with and the upper of said pivots will be above the rocker-pivot, whereby when the rocker is engaged

40 by the closer-latch and held in that position the closer will be supported with a minimum pressure on the latch, as practically all the weight of the bucket contents will be carried

45 by the pivot 550'' of the rocker. A second connecting-rod 596' is also shown pivoted, respectively, to the closer and to a crank-arm or portion carried by the rock-shaft 550'', which is shown constituting the pivot of the rocker 550C.

The closer-latch for locking the rocker in position when the closer is shut, and which is designated by 82, is shown pivoted at 87

50 to the bucket G and provided with a detent or stop 81 in position and adapted for engaging a co-operating stop 550''' on the rocker 550 when the parts are in the closed position. The closer-latch 82 is shown counterweighted,

55 and is also shown limited in its movement toward the stop or detent 550''' by a stop 82''. It will be observed that the closer-latch swings upward to engage the rocker, and hence will be released from engagement therewith by a

60 downward movement.

As a means for controlling the stream from the supply-chute, a valve substantially similar to the improved valve described and claimed in Letters Patent No. 535,727, granted

65 to me March 12, 1895, will preferably be employed. Such a valve is shown at 70, pivoted within arms or brackets 5', depending from

the top plate of the machine, the pivot or axis of movement of the valve being designated by 70'. As a means for actuating the valve 70 to close the same, a lever is shown at 504, (see Fig. 3,) pivoted to the frame at 505, and having at its forward end a friction-roller 506, adapted to engage the cam-surfaces 501 and 502 of a cam-lever and to oscillate said lever 75 and thereby the valve. This cam-lever is shown at 500 as a depending arm movable with the valve and having a reducing cam-face 501 and a cut-off cam-face 502. The lever 504 is shown weighted at its forward 80 end at 507. It will be obvious that by reason of the riding up of the roller 506 on the cam-faces of the cam-lever a progressively-decreasing leverage will be exerted on the valve for actuating the same during the closing move- 85 ment thereof, and that by reason of the peculiar curvature of the cam-faces the force exerted by the weight 507, acting through the lever 504, will be applied to the valve in a

90 peculiar ratio of decreasing efficiency, it being obvious that the cut-off cam-face will have a relatively-greater efficiency than the reducing cam-face, and that therefore the valve-closing actuator will be effective to close the valve quickly as soon as the friction-roller 95 passes off the reducing cam-face 501 and is brought into contact with the cut-off cam-face 502.

The valve 70 is shown in the drawings having a connecting-rod 558, depending from and 10 operable therewith and pivotally secured to the upper rear portion thereof, and having also the lower end of said rod in position and adapted to be engaged by a valve-opening actuator, which will now be described. The 105 connecting-rod 558 is illustrated as constituting the means for transmitting to the valve the valve-opening movement or thrust of a valve opening actuator, and that valve-actuator which has for its function the operation 110 of opening the valve is shown herein pivotally supported by the scale-beam B. The valve-opening actuator may be any mechanical means in operative relation with the valve for opening the same; but in the form there- 115 of illustrated this valve-opening actuator consists of a lever 551, pivoted at 551' to the scale-beam B and counterweighted at its rear end. It will be noticed that the pivot 551' of this actuator 551 is shown located between 120 the bucket-supports, so that any downward pressure exerted on the inner end of the actuating-lever 551 relatively to the bucket will oscillate said lever 551 and that a very slight pressure will be necessary for shifting or 125 oscillating said lever 551.

The connecting-rod 558 has been described as having its lower end in position and adapted to be engaged by a valve-opening actuator, and hence it will be evident that the lever 130 551 constitutes the valve-opening actuator for engaging said rod. When free to actuate the valve for opening the same, this rod 558 forms a part of the actuating means and

therefore a part of the valve-opening actuator; but when the opening of the valve 70 is prevented it will be evident that this rod forms a stop device for limiting or checking the valve-opening movement of the valve-opening actuator 551.

When the weighing mechanism has come very near to the close of the poising period, it is important to instantly bring about the release of the shiftable member of the bucket mechanism for discharging the bucket-load. For holding this shiftable member against movement a rocker 550 has been described, and this rocker is held in its normally-effective position by means of a latch 82. The valve mechanism is illustrated provided with an actuator or releaser device for tripping this latch 82 by the power of the valve mechanism on the closing of the valve, thereby releasing the shiftable member of the bucket mechanism for discharging the load.

The connecting-rod 558 is illustrated provided with a latch actuator or releaser device 88, which is adapted at the close of the poising period to be brought into engagement with a stop-arm 83 to trip the latch to thereby release the closer.

The connecting-rod 558 is shown provided with a link or guide connection 559, which is connected with a crank-arm, (not shown,) which latter is affixed to a rock-shaft 559'', bearing in the side frame 2. The opposite end of this lever is shown provided with an actuating-lever 571, which will be affixed to said rock-shaft 559'' in some suitable manner—for example, by means of clamping mechanism. As hereinbefore stated, the connecting-rod 558 has its lower end in position and adapted to be engaged by a valve-opening actuator 551. On the descending movement of the beam mechanism this actuator will be carried therewith, during which movement the closing of the valve will be relatively retarded through the agency of said connecting-rod 558, which then serves as a stop device. On the ascending movement of the valve-opening actuator 551 it will, by the engagement thereof with the connecting-rod 558, serve as a means for imparting to the valve the valve-opening thrust necessary for opening the valve. Hence it will be obvious that by shifting the connecting-rod out of operative relation with the valve-opening actuator 551 the latter will be ineffective for opening the valve on the return of the valve-opening actuator to the normal position thereof, Figs. 2 and 4. It will be obvious, then, that at this period the valve-closing actuator will be effective for holding the valve in the closed position, as shown by the dotted lines in Fig. 3, at which time the friction-wheel 506 will be in engagement with the cut-off cam-face 502 of the cut-off cam-lever 500. The normal position of the connecting-rod is shown in Fig. 2, and it will be noticed that the lower end thereof is positioned for engagement by the valve-opening actuator 551.

Means will be provided for shifting or throwing the connecting-rod out of operative relation with the valve-opening actuator 551 to thereby render the latter ineffective for opening the valve on its return movement.

The actuating-lever or throw-out 571 is shown provided with a locking or holding pin 571', which is adapted to enter a locking or holding recess in the side frame 2 of the machine, and thereby holding the connecting-rod 558 against shifting movement. The normal holding position of the actuating-lever 571 is shown in Fig. 2. The locking-pin 571' will be provided with a suitable spring of sufficient power for maintaining the locking-pin within the recess in the frame. It will be obvious that when the lever 571 is grasped by hand and given a half-rotation, as shown in Fig. 4, the connecting-rod 558 may also be shifted for carrying the same out of operative relation with the valve-opening actuator 551.

In connection with the bucket mechanism and with the stream-controlling valve for controlling the supply-stream and with the valve-opening actuator a register is employed, the normal function of which is to register the bucket-loads discharged by the bucket, the register having a shiftable member normally held against shifting movement and co-operatively disposed relatively to the valve-opening actuator, but releasable at a predetermined period, and also adapted when so released for rendering the valve-opening actuator ineffective for opening the valve. As shown, this member of the register device is operatively disposed relatively to the connecting-rod 558 and is adapted when released in the manner hereinafter described for shifting said connecting-rod so that it may be carried out of the path of the ascending valve-opening actuator 551.

The stop-register for registering the bucket-loads discharged by the bucket is designated in a general way by R and is shown fixedly secured thereon by some suitable fastening means, as screws, and has a shiftable member normally held against movement, and when released to stop the operation of the machine. The register shown is substantially similar in all material respects to that described and claimed in Letters Patent No. 408,192, granted to me July 30, 1889, and will, as has been the weighing mechanism, be briefly described.

The register R is shown provided with a rock-shaft 30, disposed longitudinally thereof and journaled in suitable bearings 30' and 30'', formed at the longitudinal extremities of the register-casing, which latter will be provided for protecting the working parts from injury. The rock-shaft 30 is shown constituting the shiftable member of the register, and will be normally held against movement; but this rock-shaft is adapted, through certain connections to be hereinafter described, immediately on the shifting movement thereof to permit an instantaneous shift of the connecting-rod out of operative relation with the

actuator 551, whereby the latter will be rendered ineffective for opening the valve as it resumes its normal position.

The registering mechanism is operated by the shiftable member of the bucket mechanism which, as hereinbefore stated, is shown constituting the closer L. A connecting-rod is shown at 40, pivoted, respectively, to the closer-arm 79 and to the actuating-lever 41 of the registering mechanism.

The registering mechanism proper consists of a series or train of peripherally-toothed gears and one practically-plain actuator, the teeth forming a series of spaced segmental recesses or depressions. These toothed gears are shown at 32, 33, and 34. These peripherally-toothed gears are rotated through the medium of the rotative driving or power disk 31, the periphery of which is shown plain except for the actuating-tooth 31'. The disk 31, which constitutes the power-disk, is shown mounted on a shaft 31'', disposed transversely of the register-casing, one end of which is journaled in the face or front plate of the casing of the registering mechanism and the other end of which is journaled in the back plate of said casing and projects beyond said back plate. The latter end of this shaft 31'' will have thereon a ratchet 33''', which will be rotated by a pawl 34''', (illustrated,) carried by the actuating-lever 41, which is shown operatively connected with the closer L by the connecting-rod 40. The disks 31, 32, 33, and 34 will be each mounted for rotation on a series of studs suitably carried by or formed on the back plate of the casing. The disks 31, 32, and 33 are each shown provided with actuating-teeth 31', 32', and 33' for a purpose to be hereinafter described. The bearing-studs for each of the disks or gears 31, 32, 33, and 34 will each also be provided with an index-dial bearing the usual numbers "0" to "9." It will be assumed that the bucket has received the complete bucket-load and that it has descended for discharging the same. At the proper period the latch actuator or releaser device 88 will be carried into engagement with the stop 83 of the closer-latch and will trip the same for releasing the closer. On the release of the closer the connecting-rod 40 will be given an upward thrust, which will in turn operate the actuating-lever 41, which operation rotates the supporting-shaft 31'' of the first of the series of disks, and hence the actuator 31, the index-dial of the latter prior to this operation having been at the zero-point. On the complete rotation of the first disk this will rotate the succeeding disk, and when the latter has made its complete rotation the succeeding disk will also be rotated through the teeth 31' 32', and so on in the usual well-known manner.

As hereinbefore stated, the rock-shaft 30 constitutes the shiftable member of the register mechanism. Suitable means will be provided for holding said rock-shaft against movement until, at a predetermined period,

other means will be brought into play for releasing said rock-shaft.

The rock-shaft 30 will be provided with a series of holding projections disposed one in advance of the other on the periphery thereof. These holding projections are shown at 36, 37, 38, and 39, and the purpose of the same will now be described. A series of bell-crank or holding levers are shown at 45, 46, 47, and 48, pivoted to the back plate of the casing of the register. The lower ends of these bell-crank levers will be provided with hooks for engaging the holding projections on the rock-shaft, and to maintain them in such engagement suitable springs will be provided. The series of bell crank-levers shown constitutes the means for holding the rock-shaft 30 against movement by engagement of the hooks thereof with the holding projections on said rock-shaft.

As hereinbefore stated, the studs on which the series of gear-wheels or disks 31, 32, 33, and 34 rotate will also be provided with a series of index dials or disks bearing the usual numbers from "0" to "9." These index dials or disks will also be provided with a series of removable pins or screws, which extend through such dials or disks and are adapted for engaging the normally-free ends of the bell-crank levers 45, 46, 47, and 48 to thereby trip the same, so that the holding-levers will be released for permitting a movement of the rock-shaft.

The faces of the index dials or disks are shown provided with a series of holes, ten in number, and the removable screws or pins may be placed in any one of these holes, so that the bell-cranks may be tripped at a predetermined period. It will be obvious that when all of these bell-cranks are tripped the holding projections will then be free, and hence the rock-shaft 30 will also be free for rotative movement. By placing the pins in certain of the holes certain combinations of numbers will be produced and the rock-shaft will be released at a predetermined period or when this desired combination results for rendering the valve-opening actuator ineffective for opening the valve.

The index-dials, as usual, denote units, tens, hundreds, and thousands. The pin in the first or units dial is placed at 2, the pin in the second or tens dial at 2, the pin in the third or hundreds dial at 3, and the pin in the fourth or thousands dial at 4. Hence it will be evident that when four thousand three hundred and twenty-two loads have been discharged by the bucket mechanism the lifting screws or pins will operate to lift the bell-cranks to thereby release the rock-shaft 30.

The rock-shaft 30, as hereinbefore stated, is co-operatively disposed relatively to the valve-opening actuator, so that at a predetermined point or period—that is to say, when a given number of bucket-loads have been weighed—the rock-shaft will be automatically released and will be operative, through the

agency of certain connections, for rendering the valve-opening actuator ineffective for opening the valve when this predetermined number of loads have been weighed and discharged by the bucket.

The side frame 2 is shown provided with a rock-shaft 50, journaled in bearings 50' and 50'', formed on the two members constituting the side frame 2. Approximately adjacent to each end the rock-shaft 50 is respectively operatively connected with the throw-out or shifting device for shifting the connecting-rod 558, whereby the latter will be carried out of operative relation with the valve-opening actuator 551.

The rock-shaft 50 is shown provided near one end thereof with an upwardly-extending arm or lever 51, to the upper end of which is shown pivoted a connecting-link 52, which link is also shown pivoted to the upwardly-extending crank arm or lever 53. It will be obvious that when the rock-shaft 30 of the registering mechanism is released through these described connections the rock-shaft 50 may also rock, this motion previously to the release of the rock-shaft 30 of the registering mechanism being prevented, owing to the fact that up to the moment of the release of the rock-shaft this had been held against movement by the bell-cranks 45, 46, 47, and 48, which are normally in engagement with the holding projections 36, 37, 38, and 39. Approximately near the end of the rock-shaft 50 and opposite to that end having the arm or lever 51 a second upwardly-extending arm or lever 53'' (see dotted lines, Fig. 2) is provided. The upper extremity of this lever 53'' is shown terminating in an enlargement 53', having an elongated slot which is shown embracing a laterally-projecting pin 54 of a throw-out actuator 55. This throw-out actuator has a relatively long shank which enters the hole in the side frame 2, which receives the holding-pin 571' of the throw-out actuating-lever 571 and normally impinges against said pin. It will be remembered that this holding-pin has been described as held in the normal position thereof by means of a suitable spring.

The laterally-projecting pin or stop 54 of the throw-out actuator 55 is adapted to receive the force of a relatively powerful or drive spring 56, the force of which is greater than the spring which holds the actuating-lever of the throw-out device in place. Hence it will be evident that a spring-pressed actuator is provided. The function of this spring is to furnish the power necessary for rendering the throw-out actuator 55 effective for rendering said throw-out operative for shifting the connecting-rod 558 when the shiftable member of the register is released, and subsequent also to the release of the shiftable member of the bucket mechanism. This throw-out actuator will be held in the normally-ineffective or non-movable position thereof, through the connections described, by

the rock-shaft 30 of the registering mechanism; but it will be obvious that on the first movement of the rock-shaft after this is released the throw-out actuator 55 will then actuate the throw-out device, whereby the connecting-rod 558 will be shifted out of operative relation with the valve-opening actuator 551. A suitable stop may be employed for limiting the movement of the throw-out actuator 55.

Means will be provided for effecting the instantaneous rotation of the actuating-lever 571 of the throw-out device when this is released by having the holding-pin 571' thereof thrust out of engagement with the holding-recess in the side frame 2.

The rock-shaft 559'' is shown embraced by a sleeve or collar 57 for non-rotative movement thereon, and about this sleeve or collar 57 is shown, loosely wound, a relatively-powerful coiled spring 58, which is shown secured, respectively, to the actuating-lever 571 and to the side frame 2. It will be obvious that when the holding-pin 571', and hence the throw-out, is released from the hole in the side frame 2 the actuating-lever 571 will, through the agency of the coiled spring 58, be caused to quickly rotate, thereby shifting the connecting-rod 558 out of operative relation with the valve-opening actuator 551, whereby the latter will be ineffective for opening the valve.

A suitable stop, such as 59, will be employed for limiting the rotative movement of the actuating-lever 571 when the holding-pin 571' has been thrust out of engagement with the hole in the side frame 2.

It will be obvious from the preceding description that the throw-out actuator 55 is normally held against movement through operative connections with the shiftable member of the register R and that this actuator 55 will be released only when the shiftable member of the register is released—that is, at a predetermined period, or when a given number of bucket-loads have been weighed. Hence it will be understood that the actuating-lever 571 may be rotated for shifting the connecting-rod 558 out of operative relation with the valve-opening actuator 551 independently of the register mechanism or the throw-out actuator for the purpose of making a test in the manner well known in this art.

Means will be provided for returning the throw-out actuator 55 and register mechanism shiftable member 30 to the normal position thereof, and the rock-shaft 50 (see Figs. 2 and 4) is shown provided with a resetting-lever 59', the free end of which is shown provided with a finger-piece provided with milling. This finger-piece may be grasped and the lever will be actuated for resetting the throw-out actuator in the normal position thereof.

It will be apparent from the preceding description that, in connection with a valve-opening actuator, the shifter which is pro-

vided will have a movement for rendering the valve-opening actuator ineffective for opening the valve and that said shifter will be normally held against such movement, and that
 5 the stop-register which is provided—which stop register has a shiftable member normally held against movement—will, when released, also release said shifter.

Briefly described, the operation of a weighing-machine embodying the present invention is as follows: Fig. 1 shows the parts in the normally-operative positions thereof. It will be assumed that it is desired to deliver a certain number of bucket-loads—for example,
 15 of one bushel each, or whatever the capacity of the bucket may be. The registering mechanism will be set for releasing the shiftable member 30 thereof when the desired number of bucket-loads have been weighed and discharged. The register is shown set for weighing and discharging four thousand three hundred and twenty-two bucket-loads. Let it be assumed that the last load of this number is completed. As the valve closes for cutting off the supply-stream, the connecting-rod 558, dependent from and operable therewith, will be carried downwardly by the power of the closing-valve 70. At the close of the poising period the latch actuator or releaser
 30 device 88 will be brought into engagement with the latch 82, thereby releasing the closer. As soon as the closer is released an upward thrust will be exerted on the connecting-rod 40 and the register will then register the last
 35 load of the predetermined number. When this last load has been weighed and registered, the bell-crank levers 45, 46, 47, and 48 will all be lifted from the holding projections 35, 36, 37, and 38, and the rock-shaft 30 will then be
 40 free to rotate. Immediately when the rock-shaft is released the actuator 55 will be effective for thrusting the holding-pin 571' out of the holding recess or hole in the side frame 2. On the release of the holding-pin 571' the
 45 coiled spring 58 will operate to quickly rotate the actuating-lever or throw-out 571. On the rotation of this actuating-lever 571 the connecting-rod 558 will be shifted out of operative relation with the valve-opening actuator 551 and on the return stroke of said
 50 valve-opening actuator it will be ineffective for opening the valve, as shown by Fig. 4, so that the latter will remain in its closed position. When it is desired to again use the
 55 machine, the registering mechanism may be reset or the pins in the index-dials may be simply changed or removed entirely. The actuator 55 may be also reset by the lever 59 in the manner hereinbefore described.

60 Having thus described my invention, what I claim is—

1. In a weighing-machine, the combination with a bucket; of a supply-chute; a valve for said chute; a valve-opening actuator; a shifter
 65 having a movement for rendering said valve-opening actuator ineffective for opening the valve, and having said shifter normally held

against movement; and a stop-register having a shiftable member also normally held against movement, co-operative with said shifter, and adapted to be released, and when released, to also release said shifter, substantially as specified. 70

2. In a weighing-machine, the combination with a bucket mechanism having two members, one of which is shiftable relatively to the other for discharging the load; of a supply-chute adapted for supplying a stream of material to the bucket; a valve in position and adapted for controlling the supply-stream; a valve-opening actuator; and a stop-register in position and adapted for registering the bucket-loads on the movements of the shiftable member of the bucket mechanism, said register having a shiftable member normally held against movement, and releasable at a period subsequent to the shifting movement of the shiftable member of the bucket-mechanism, and having said shiftable member of the register co-operatively disposed relatively to the valve-opening actuator, and adapted to be released, and when released to render the valve-opening actuator ineffective for opening the valve, substantially as described. 95

3. In a weighing-machine, the combination with a bucket mechanism, and with the supporting-beam mechanism thereof; of a supply-chute adapted for supplying a stream of material to the bucket; a valve in position and adapted for controlling the supply-stream; a connecting-rod depending from and operable with the valve; a valve-opening actuator supported by the beam mechanism, and adapted for transmitting to said valve a thrust for opening the valve; and a stop-register in position and adapted for registering the bucket-loads discharged by the bucket, and having a shiftable member normally held against movement and co-operatively disposed relatively to the connecting-rod of the valve and adapted to be released, and when released to permit a shift-movement of said connecting-rod out of operative relation with the valve-opening actuator, to thereby render said valve-opening actuator ineffective for opening the valve, substantially as specified. 110 115

4. In a weighing-machine, the combination with a bucket mechanism having two members, one of which is shiftable relatively to the other for discharging the load; of a supply-chute adapted for supplying a stream of material to the bucket; a valve in position and adapted for controlling the supply-stream; a connecting-rod dependent from and operable with the valve, and having thereon a releaser device positioned for releasing the shiftable member of the bucket mechanism; a valve-opening actuator in position and adapted for transmitting to said connecting-rod the thrust for opening the valve; and a stop-register in position and adapted for registering the bucket-loads discharged by the bucket, and having a shiftable member nor- 120 125 130

mally held against movement, and co-operatively disposed relatively to the connecting-rod and adapted to be released, and when released to permit a shifting movement of said connecting-rod to thereby render the valve-opening actuator ineffective for opening the valve, and at a period subsequent to the release of the shiftable member of the bucket mechanism when a predetermined number of bucket-loads have been discharged by the bucket, substantially as specified.

5. In a weighing-machine, the combination with a bucket mechanism; of a supply-chute adapted for supplying a stream of material to the bucket; a valve in position and adapted for controlling the supply-stream; a valve-opening actuator; a stop-register in position and adapted for registering the bucket-loads discharged by the bucket, and having a shiftable member normally held against movement, and operatively disposed relatively to the valve-opening actuator and adapted to be released, and when released to render said valve-opening actuator ineffective for opening the valve; and a lever also operatively disposed relatively to the valve-opening actuator, and adapted for rendering the valve-opening actuator ineffective for opening the valve, independently of the shiftable member of the register, substantially as specified.

6. In a weighing-machine, the combination with a bucket mechanism; of a supply-chute adapted for supplying a stream of material to the bucket; a valve in position and adapted for controlling the supply-stream; a valve-opening actuator; a throw-out normally held against movement, and operatively disposed relatively to the valve-opening actuator, and adapted when moved to render said valve-opening actuator ineffective for opening the valve; a throw-out actuator in position and adapted for actuating the throw-out at a predetermined period; a stop-register having a shiftable member normally held against movement and operatively connected with said actuator and adapted to be released, and when released to also release the actuator, whereby the latter will be effective for actuating the throw-out to thereby render the valve-opening actuator ineffective for opening the valve, substantially as specified.

7. In a weighing-machine, the combination with a bucket mechanism; of a supply-chute adapted for supplying a stream of material to the bucket; a valve in position and adapted for controlling the supply-stream; a valve-opening actuator; a throw-out normally held against movement, and operatively disposed relatively to the valve-opening actuator; a spring-pressed throw-out actuator normally held against movement and adapted to be released, and when released to actuate the throw-out to thereby render the valve-opening actuator ineffective for opening the valve; and a stop-register having a shiftable member normally held against movement, and operatively connected with said actuator, and adapted to

be released, and when released to also release said actuator, whereby the latter will have an effective movement for actuating the throw-out to thereby render the valve-opening actuator ineffective for opening the valve, substantially as specified.

8. In a weighing-machine, the combination with a bucket mechanism; of a supply-chute adapted for supplying a stream of material to the bucket; a valve in position and adapted for controlling the supply-stream; a valve-opening actuator; a throw-out normally held against movement and operative for rendering the valve-opening actuator ineffective for opening the valve; a throw-out actuator also normally held against movement and adapted to be released, and when released to thereby release the throw-out; a stop-register in position and adapted for registering the bucket-loads, and having a shiftable member normally held against movement and operatively connected with the throw-out actuator and adapted to be released, and when released to also release said throw-out actuator, whereby the latter will be effective for releasing the throw-out to thereby render the valve-opening actuator ineffective for opening the valve; and a resetting-lever in position and adapted for returning the throw-out actuator to the normally non-movable position thereof, substantially as specified.

9. In a weighing-machine, the combination with a bucket mechanism; of a supply-chute adapted for supplying a stream of material to the bucket; of a valve in position and adapted for controlling the stream; a valve-opening actuator; a throw-out normally held against movement, and adapted when released to render the valve-opening actuator ineffective for opening the valve; a throw-out actuator also normally held against movement, and adapted when released to also release the throw-out; a rock-shaft journaled in the frame-work of the machine; connections operatively connecting the throw-out actuator and the shiftable member of a register with said rock-shaft; and a stop-register in position and adapted for registering the bucket-loads, and having a shiftable member normally held against movement, and adapted when released to also release said throw-out actuator, whereby the latter will be effective for releasing the throw-out to thereby render the valve-opening actuator ineffective for opening the valve, substantially as specified.

10. In a weighing-machine, the combination with a bucket-mechanism; of a supply-chute adapted for supplying a stream of material to the bucket; a valve in position and adapted for controlling the supply-stream; a valve-opening actuator; a throw-out normally held against movement and adapted to be released, and when released for rendering the valve-opening actuator ineffective for opening the valve; a throw-out actuator also normally held against movement and adapted to be released, and when released to also release the

throw-out, and having a stop in position and adapted for limiting the movement of said actuator; and a stop-register in position and adapted for registering the bucket-loads and
5 normally held against movement and adapted to be released, and when released to also release the throw-out actuator, whereby the latter will be effective for actuating the throw-

out to thereby render the valve-opening actuator ineffective for opening the valve, substantially as specified.

FRANCIS H. RICHARDS.

Witnesses:

FRED. J. DOLE,
S. W. POTTS.