No. 631,053. Patented Aug. 15, 1899.

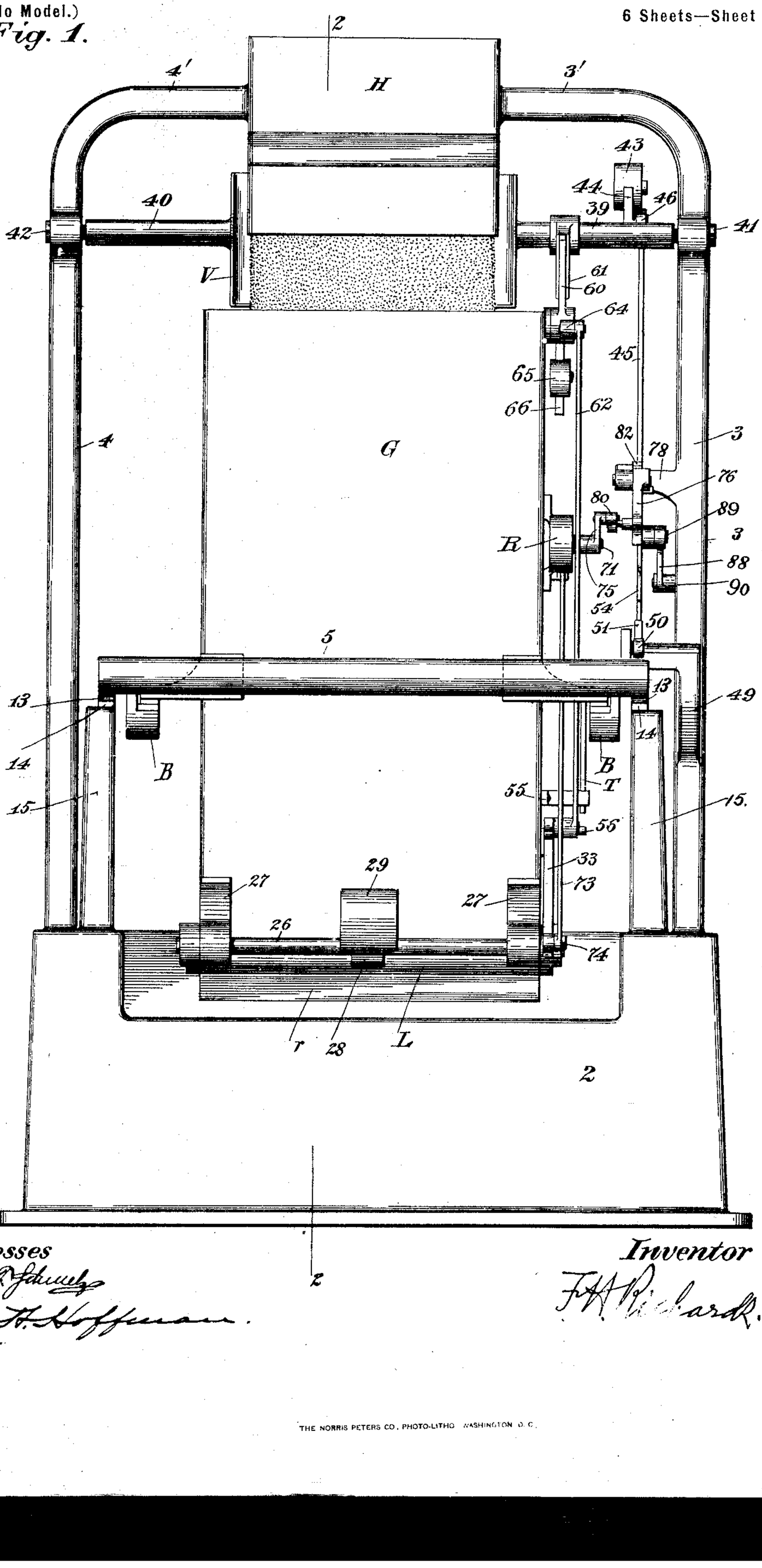
F. H. RICHARDS.

WEIGHING MACHINE.

(Application filed Mar. 20, 1899.)

(No Model.) 6 Sheets—Sheet 1.

Fig. 1.



Witnesses
Chas. D. Schmeltz
Geo. H. Hoffmann.

Inventor
F. H. Richards.

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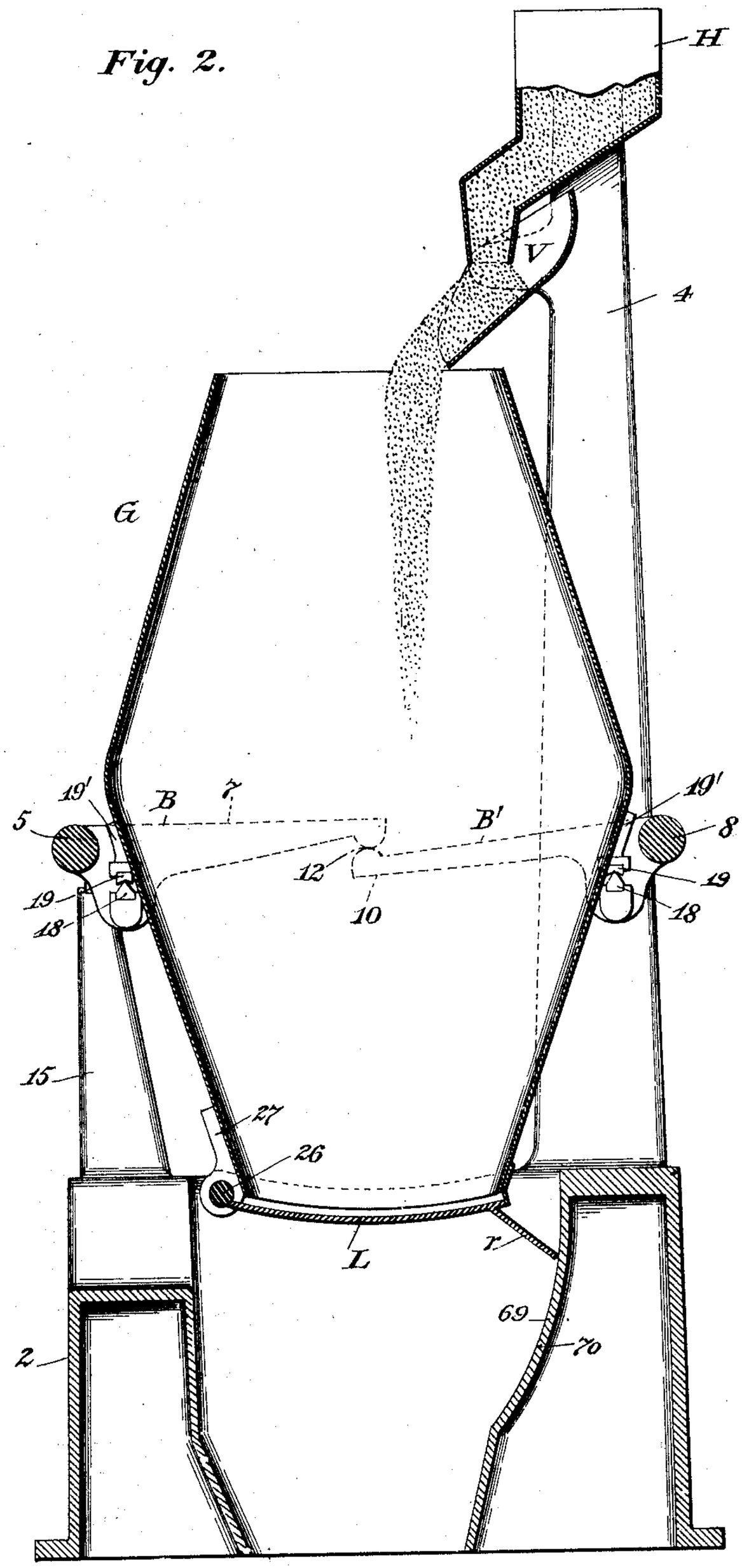
Fig. 2.



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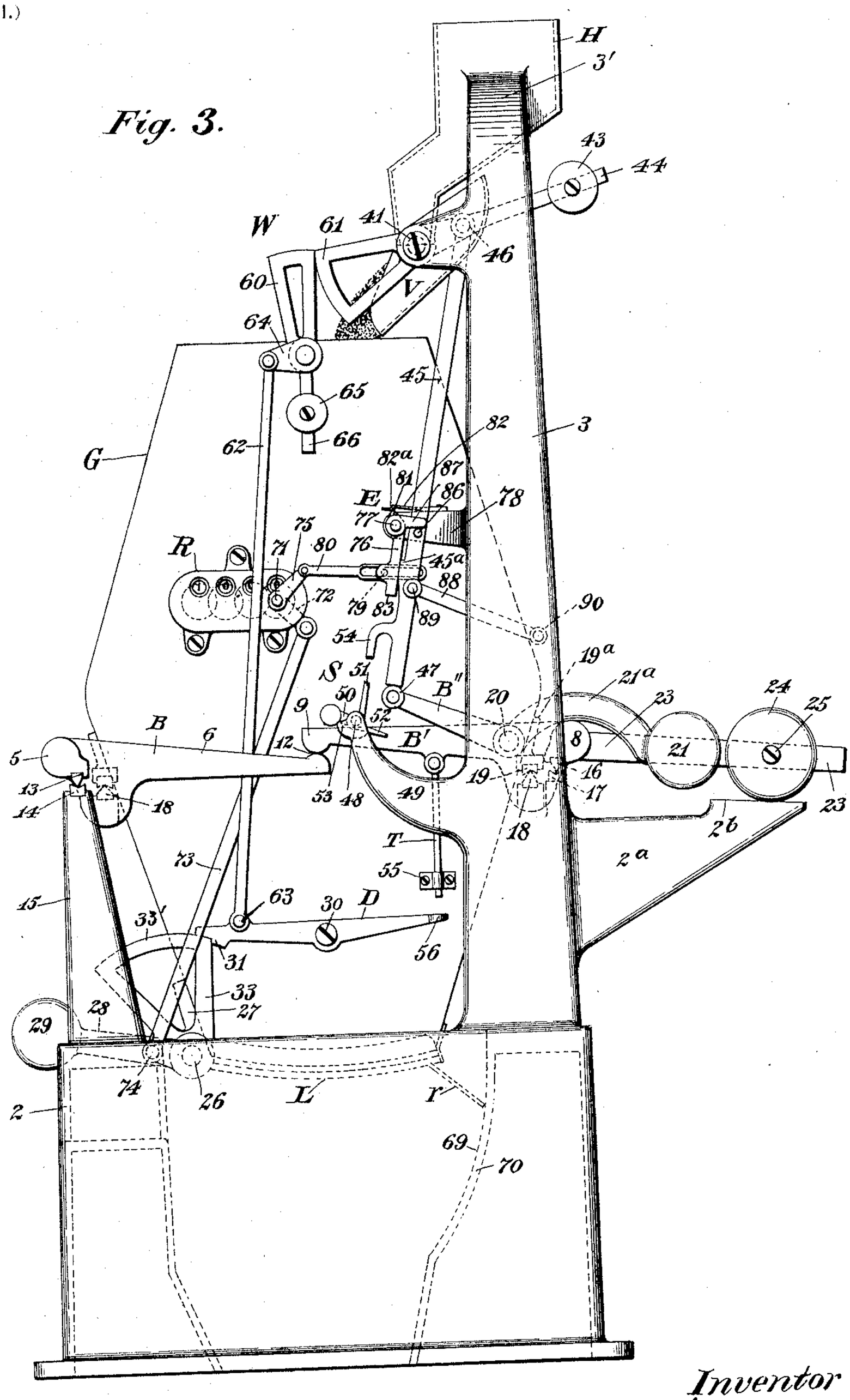
6 Sheets—Sheet 3.

Fig. 3.



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Chas. F. Schmelz
Geo. H. Hoffmann.

Inventor
F. H. Richards.

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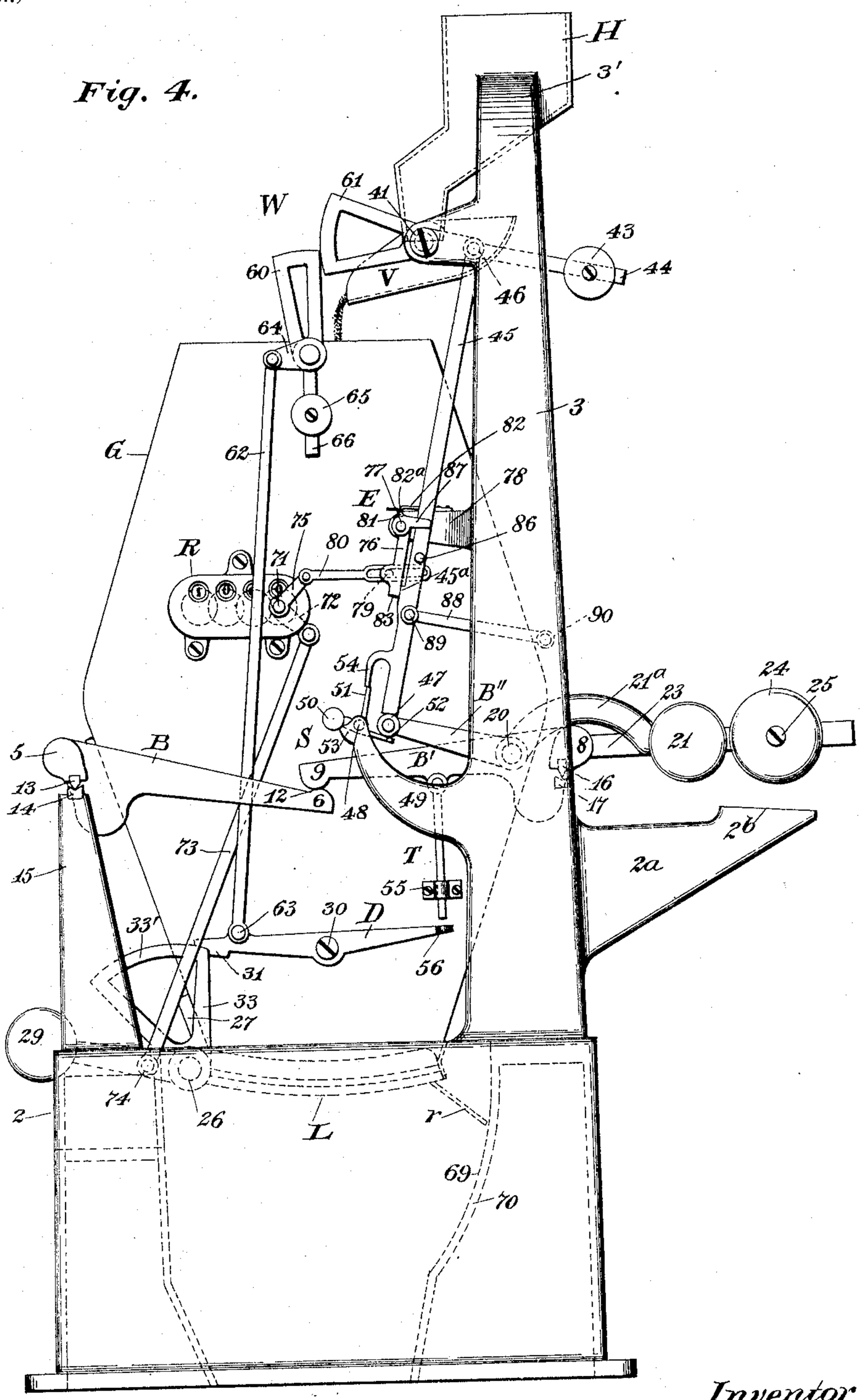
(No Model.) 6 Sheets—Sheet 4.

Fig. 4.



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Chas. P. Schmeltz
Geo. H. Hoffmann.

Inventor
F. H. Richards.

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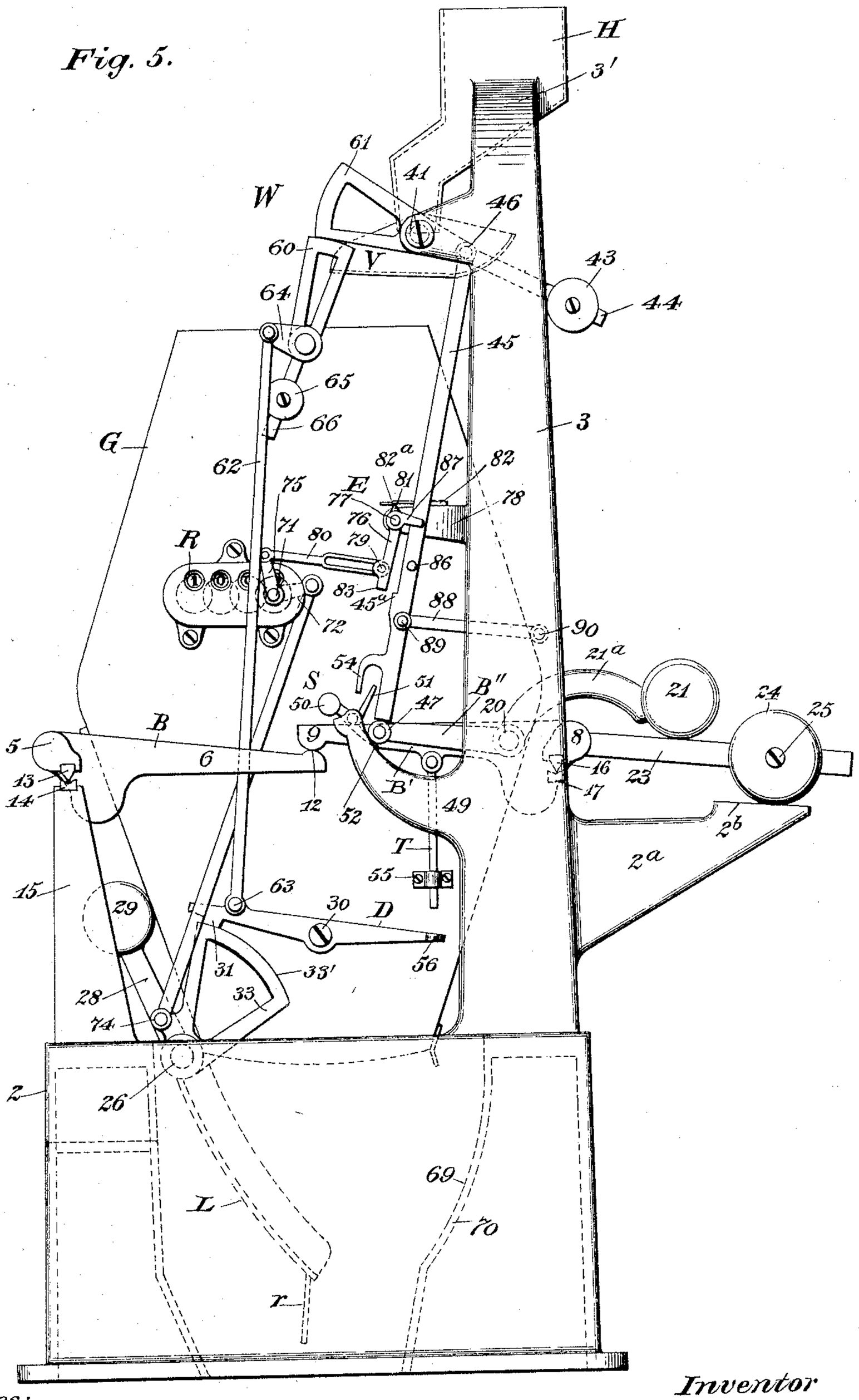
(No Model.) 6 Sheets—Sheet 5.

Fig. 5.



Witnesses:
Chas. D. Schmeltz
Geo. H. Hoffmann.

Inventor
F. H. Richards.

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(No Model.) 6 Sheets—Sheet 6.

Fig. 6.

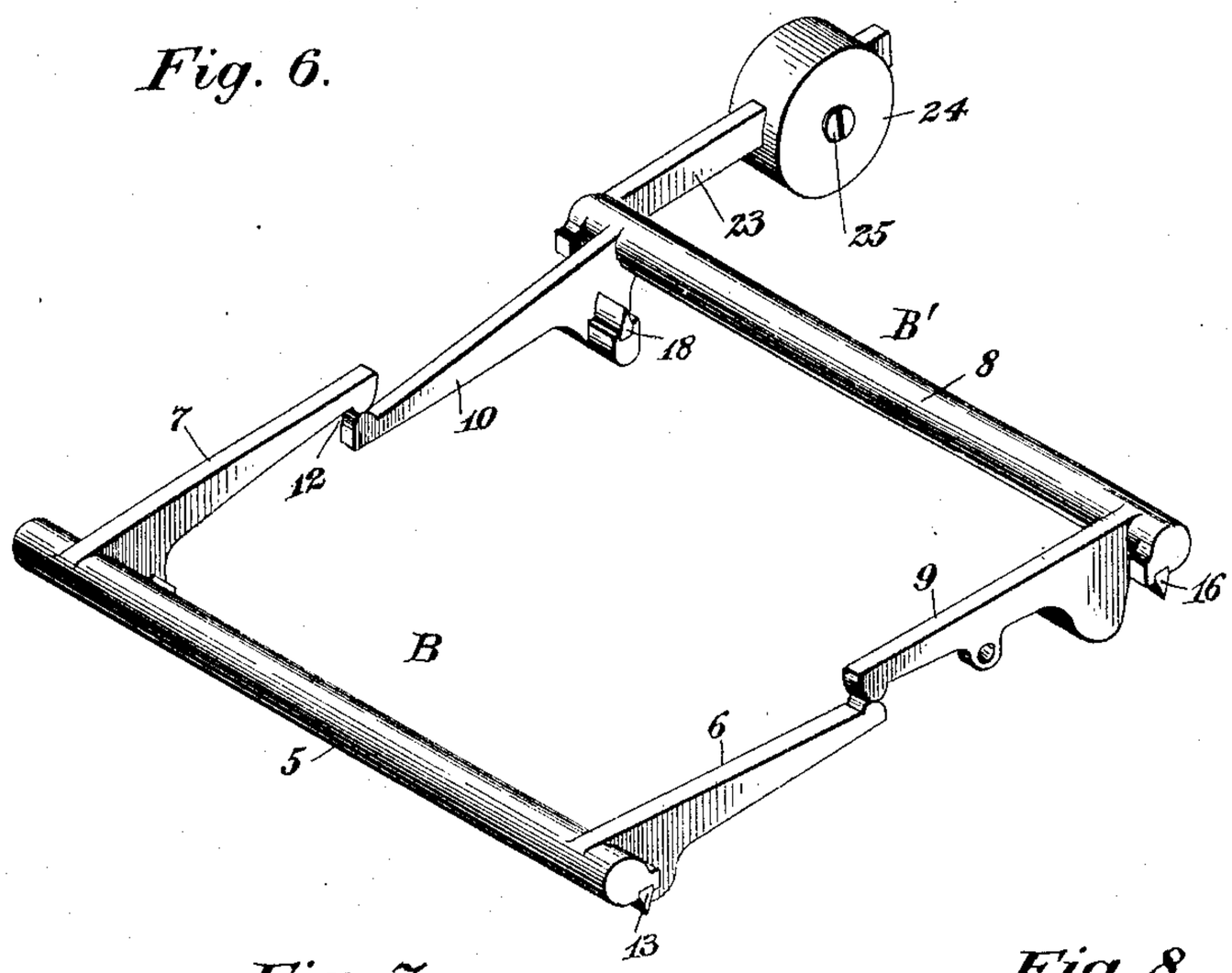


Fig. 7.

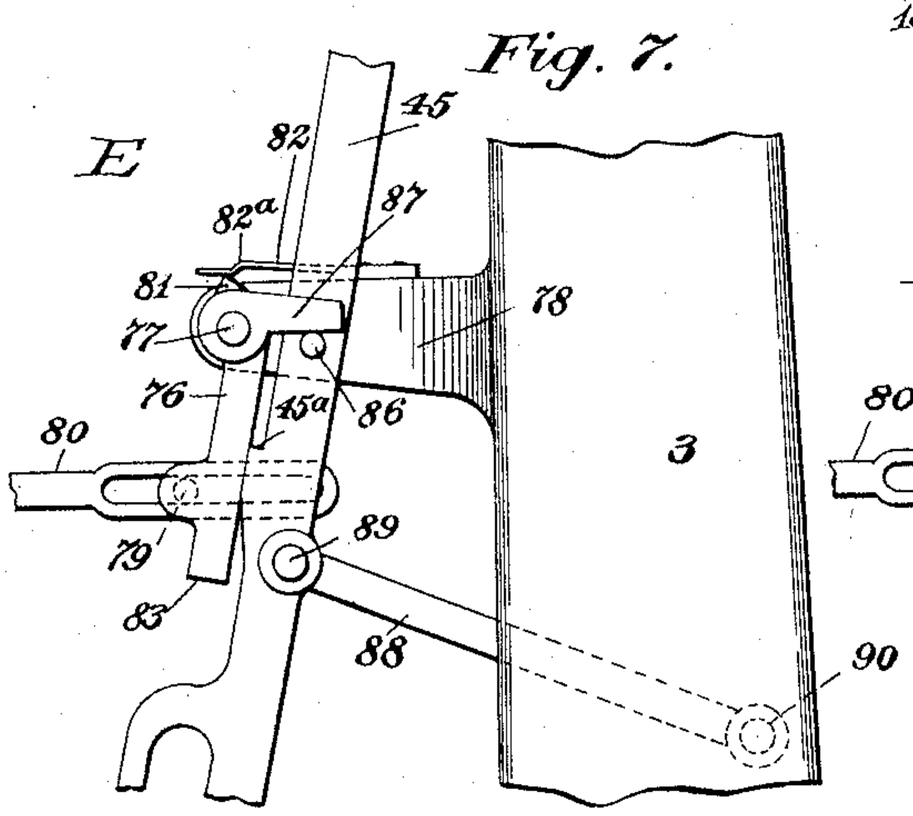


Fig. 8.

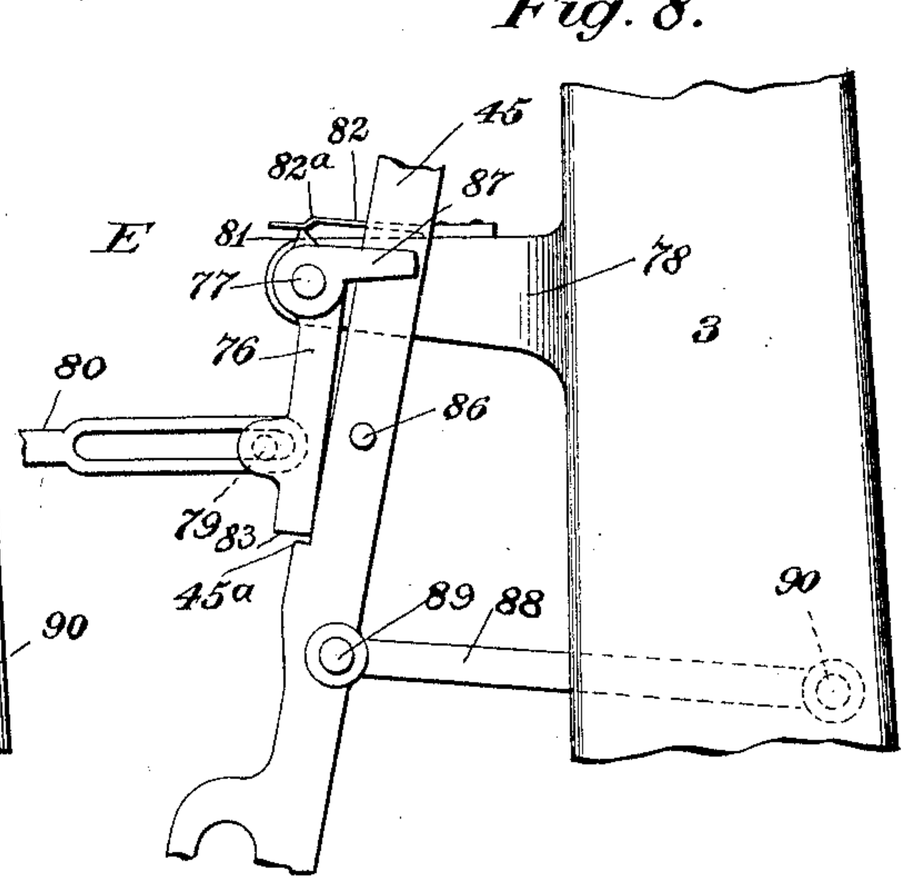
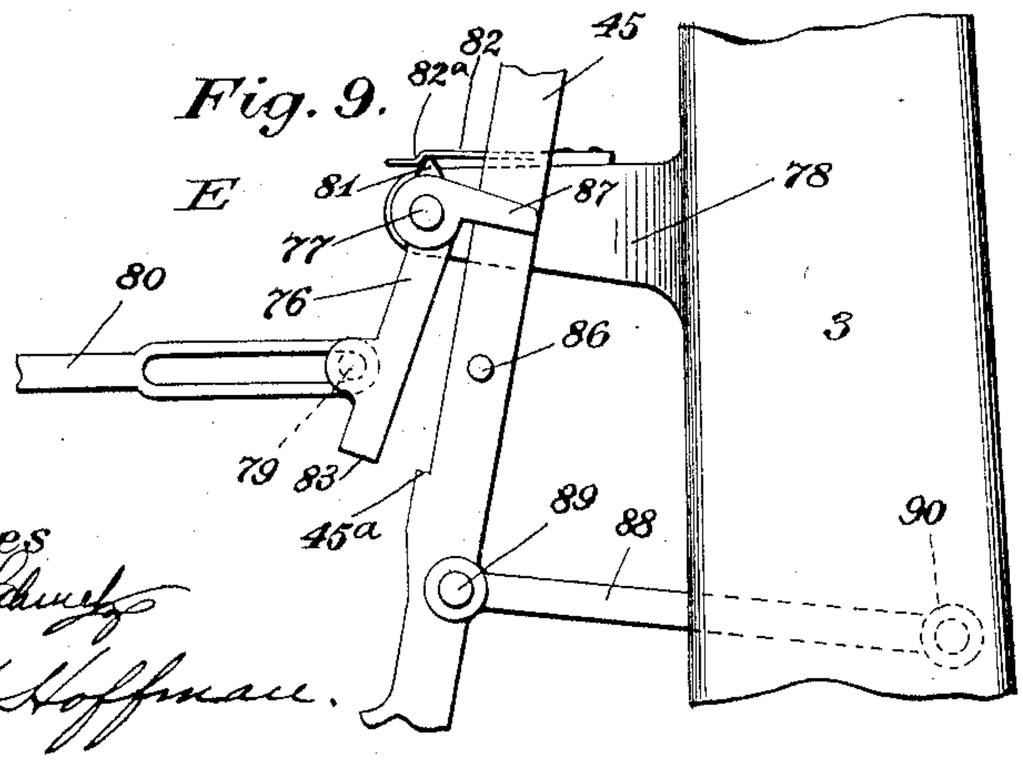


Fig. 9.



Witnesses
Chas. D. Johnson
Geo. H. Hoffman.

Inventor
F. H. Richards.

UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT.

WEIGHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 631,053, dated August 15, 1899.

Application filed March 20, 1899. Serial No. 709,753. (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 machines for weighing and delivering various kinds of material, and has for its object an improved machine of the character specified in which the passage of material toward the load-receiver is prevented when a latch is shifted to permit the closer to open.

A further object of my invention resides in means for automatically registering each successive load upon the discharge thereof from the load-receiver and in connection with such register in mechanism for stopping any further supply of material to said load-receiver should the register fail to operate properly and not cause the discharge of the load to be recorded.

My improved weighing-machine embodies, preferably, valve-controlling means operable to prevent the opening of the valve and held in position by the closer-holding latch when said latch is shifted to release the closer, whereby the supply-stream or any portion thereof cannot flow into the bucket until said latch has resumed its normal position to hold the closer shut, the advantage being that the valve is not only prevented from opening while the closer is open to any extent, but is also prevented from opening until said closer is shut and is latched in such position. In that form of improved machine illustrated the valve-controlling means consist of a valve-controller proper and a device, which may be a thrust-rod or other intermediate contrivance, located to engage the valve-controller and latch, respectively, and to be operated by said latch on the initial opening movement of the closer, so as to shift said valve-controller into a position to prevent any opening movement of the valve. Additional means hereinafter described are also provided whereby the opening movement of the supply-valve is prevented should a load have been discharged from the load-receiver and not have been recorded by the register owing to the failure of the closer to open sufficiently to actuate such register.

In the drawings accompanying and forming a part of this specification, Figure 1 is a front elevation of my improved weighing-machine. Fig. 2 is a transverse vertical section taken in line 2 2 of Fig. 1. Figs. 3, 4, and 5 are side elevations of the machine as seen from the right in Fig. 1, showing the positions occupied by the different parts during the making and the discharge of a load. Fig. 6 is a perspective view of the scale-beams, illustrating the manner in which the several arms are in engagement with each other. Fig. 7 is a view, on an enlarged scale, of the latch controlling the valve-actuator, its position corresponding to that shown in Fig. 3. Fig. 8 is a similar view of the latch in a position when the register has failed to record the discharge of a load; and Fig. 9 represents the latch in a position when the register has been properly operated to record the discharge of a load, said position corresponding to that shown in Fig. 5.

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

The framework for supporting the several parts of the machine may be of any convenient construction, and it is represented consisting of the chambered or hollow base 2 and the side frames 3 and 4, mounted thereon, said frames having lateral extensions 3′ and 4′ at the top, secured to the hopper H of ordinary construction, which serves to supply a stream of material to the load-receiver.

The weighing mechanism consists of a load-receiver and beam mechanism therefor, the former of which is in the form of a hopper-shaped bucket or receptacle, as G, supported upon the main beams B and B′, respectively. Each scale-beam embodies a pair of unalined arms located at opposite sides of the bucket, an arm of one of the beams being over and preferably in engagement with an arm of the other beam at one side of the bucket and an arm of the other beam being over and in engagement with the complemental beam-arm at the opposite side of the bucket, whereby on the reciprocation of the latter each beam serves as a guide for the other beam. Each of the beams comprises a shaft portion and a

pair of arms extending therefrom, the shaft portion of the beam B being designated by 5 and the arms thereof by 6 and 7 and the shaft portion of the beam B′ by 8 and the arms thereof by 9 and 10, said last-mentioned arms projecting in a direction opposite to that of the beam-arms 6 and 7. On comparison of Figs. 2 and 3 it will be observed that the arm 6 of beam B is under the arm 9 of beam B′ and that the arm 7 of beam B is over the arm 10 of beam B′, the engaging portions of the several arms being curved, as at 12, to decrease their contacting surfaces. The shaft portion 5 of the beam B is provided at its ends with knife-edges 13, working in V-shaped bearings 14 in the upper ends of posts or standards 15, secured to or forming a part of the base 2, and the shaft portion 8 of the beam B′ has a similar pair of knife-edges, as 16, resting in the bearings 17 of the side frames 3 and 4, respectively. The several beam-arms are furnished with knife-edges 18 between and adjacent to their points of support, which sustain V-shaped bearings 19, attached at opposite sides to the load-receiver by brackets 19′. The beam B′ carries an auxiliary beam B″, pivoted at 20 to the arm 9 of the main beam B′ and consisting of a lever having a rear extension 21^a, carrying a counterweight 21, which serves as a part of the counterpoising means, said arm 21^a being adapted to rest during the descent of the beam mechanism upon the shaft portion 8 of the beam B′, (see Fig. 4,) while a rearward extension 23, attached to or constituting a part of the beam B′, carries a weight 24, adjustable thereon and held in a fixed position by a set-screw 25. The downward movement of the weight 24 and the consequent ascent of the bucket G are limited by a bracket or extension 2^a, secured to or forming a part of the side frame 3, and in order to prevent the beam mechanism and its dependent parts from being disturbed when it is desired to adapt the machine to weigh a different amount of material I deem it preferable to form the rest-face 2^b of said bracket in parallelism with the line of adjusting movement of the weight 24 on beam-arm 23, so that said weight may be moved along on said arm without in any way altering the respective positions of either the beam or valve operating mechanisms. The weights 21 and 25 are adapted to counterpoise the loaded bucket B.

The load-receiver or bucket G has in its lower portion the usual discharge outlet or opening covered by a closer L, pivoted to the lower forward side of the bucket at 26, and the pivot 26 consists of a transverse rock-shaft supported in brackets 27, secured to the opposite sides of the bucket, which shaft is provided with an arm 28, carrying the closer-shutting weight 29 at its outer end. Means will be provided for holding the closer shut during the load-supplying period, and said means include a member coöperative with the closer and a latch adapted to engage said member, one of said closer-holding parts having a curved face adapted to run in contact with the other member on the opening movement of the closer. The closer-holding latch is designated by D, it being preferably a gravity-latch, so that the working end thereof may fall into engagement with the coöperating member secured to the closer, and this latch is preferably pivoted, as at 30, to the load-receiver and has at its working end a hook or shoulder 31, adapted to engage a segmental or skeleton plate 33, which is fixed to the closer-shaft 26, and the face 33′ of which plate may be of an eccentric shape, as shown in the drawings, although I do not limit myself to such construction.

To release the closer L, the right-hand end of the latch D is preferably engaged by a tripping device to lift the opposite end of said latch above the segmental frame 33, and this operation takes place automatically on the completion of a load, so that the closer L will be forced open thereby and will thus operate said plate 33 to prevent the latch D from returning to its normal position. Simultaneously with the release of the closer the valve-controlling means at the upper end of the bucket will be thrown into operation, as will hereinafter appear. The face 33′ of the plate 33 is preferably made eccentric to its axis of rotation, so that the latch D will be lifted still farther by the closer as it opens, thereby increasing the effectiveness of the valve-controlling means.

The chute H hereinbefore mentioned constitutes a convenient source of supply for delivering a stream of material to the bucket G, the passage of the supply-stream being regulated by a valve, as V, oscillatory below the chute to reduce and then cut off the stream flowing therefrom, and said valve is provided with side bars 39 and 40, having journal-openings in their ends to receive pivot-screws 41 and 42 on the side frames 3 and 4, respectively, as shown in Fig. 1.

The device illustrated for closing or for swinging the valve under the mouth of the hopper H to cut off the supply-stream consists of a valve-closing weight 43, secured in the outer end of an arm 44, which projects rearward from the bar 39 and which causes the valve to tend normally to close, it being governed, however, by the beam mechanism or the auxiliary beam B″, which serves as a valve-opening actuator and which is in contact with a rod 45, connected with the valve V. The upper end of said rod is pivoted, as at 46, to the valve-closing arm 44, the lower end of the rod bearing against a projection or a roll 47 on the inner end of the beam B″, so that when said parts are in engagement the valve cannot be closed too quickly during the downstroke of the weighing mechanism by the weight 43. On the return of the auxiliary beam B″ to its normal position an upward thrust is imparted to the rod 45, which in turn is transmitted to the valve V to swing

the same open, as shown in Fig. 3, thereby again to permit the supply-stream to enter the load-receiver G.

Means are provided for intercepting and temporarily holding the valve during its advancing or closing movement and at a time when the load is nearly completed, so that a drip or reduced stream may flow from the hopper H over the valve V, and thus into the bucket, for the purpose of "topping off" the load, and said means involves as a part thereof a stop, such as S, pivoted, as at 48, upon the forwardly-extending arm 49 of the side frame 2, said stop being in the form of a three-armed lever, the arms of which are designated, respectively, by 50, 51, and 52 and the weighted arm 50 of which rests on the nose 53 of the frame-arm 49 and serves to hold the arm 51 in place to be engaged by the lateral projection 54 of the rod 45 during the descending movement thereof. At the commencement of the poising period or when the load in the bucket G is nearly completed the projection 54 of the rod 45 will strike the arm 51 of stop S, as shown in Fig. 4, so that the valve is temporarily held against the closing action of its weight to enable a reduced or drip stream to flow into the bucket to complete the load. As the drip-stream flows into the bucket it will continue to descend with the poising side of the beam mechanism, and the working end of the auxiliary beam B″ will move away from the lower end of rod 45.

The stop S will preferably be tripped on the completion of a load by the beam mechanism, whereby the valve V will be released, so that it may be instantly shut by the action of the valve-closing weight 43, and to accomplish this purpose the arm 52 of said stop is disposed in the path of movement of the projection or roll 47 on the auxiliary beam B″, so that near the close of the poising period said roll will strike said arm, and on the continuation of the downward movement of the load-receiver and beam mechanism, and when the load is completed the arm 51 of the stop S will be swung from under the projection 54 of the rod 45, as indicated in Fig. 5, thereby releasing the valve V, which is then promptly closed by the weight 43.

The closer-holding latch D, which I have hereinbefore described, is preferably tripped by the beam mechanism, the beam B′ carrying a latch-tripper for that purpose, which is represented as a vertically-reciprocatory rod T, pivoted at its upper end to the poising side of the beam B′ and guided at its lower end by a bracket, as 55, attached to the bucket. On the completion of the load the tripper will be forced rapidly downward into contact with a lug or ear 56, formed on the right-hand end of the latch, thereby raising the opposite end of said latch above the segment 33 to release the closer, which will then be forced open by the weight of material contained within the bucket, as shown in Fig. 5, and during such opening movement the segment 33 will be rotated to carry the face 33′ thereof beneath the latch D and lift the same, as above stated.

In connection with a closer-holding latch my invention comprehends the provision of valve-controlling means operative with said latch and shifted or actuated thereby into position to prevent an opening movement of the valve just prior to the opening movement of the closer, so that when the latch is tripped to release the closer said valve-controlling means is immediately rendered active to lock the valve in its closed position. The valve-controlling means is designated in a general way by W, and consists in the present case of a valve controller or stop, which may be a segment 60, mounted on the bucket, as shown, and adapted to engage a segment 61, secured to the bar 39 of the valve, so that while the latch D is being disengaged from the segment 33 the segment 60 will be caused to pass underneath the segment 61, as shown in Fig. 5, the segment 60 being directly operated from the latch D by means of a connector 62, the the lower end of which is pivotally secured, as at 63, to said latch, while its upper end is articulated to a crank-arm 64, constituting a part of the segment 60. In order to avoid overbalancing of the parts and to cause their return to their respective normal positions, I provide a counterweight 65 on the arm 66, which also forms a part of the segment 60 above mentioned. It will be seen that by the arrangement of the latch D and the segments 60 and 61 any accidental release of the closer before the completion of the load in the bucket G will be entirely obviated, since, as will be noticed by referring to Fig. 3, the segment 60 cannot swing under the segment 61 until said parts are in the positions shown in Fig. 5 of the drawings, while when the valve is open to any extent the segment 61 will prevent a rotation of the segment 60, so that by this means any movement on the part of the latch D is rendered impossible. It will thus be seen that the segments 60 and 61 form stops for interlocking the valve and the closer-latch one with the other, so that when either one is open to any extent the other is locked in its closed position. When the latch is tripped in the manner hereinbefore specified, the segment 60 will immediately swing under the segment 61, so that the latter is prevented from movement, which action would result in the reopening of the valve. When all of the material passes from the closer or a regulator connected therewith, (such a regulator being usually provided,) the closer will be shut by the counterweight 29, and the segment 33 will be rotated in an opposite direction, whereby when the engaging face of said segment 33 is opposite to the adjacent coöperating face of the notch 31 the latch D will drop again to hold the closer shut. When the latch falls into place, the segments 60 and 61 will resume their initial positions, as shown in Fig. 3, and the valve will be locked in its open position.

For the purpose of retarding the return movement of the closer on the discharge of a load said closer is furnished with a regulator, as *r*, which consists of an angular blade attached to the under side of the closer L, near its discharge edge, said blade as the closer shuts being preferably contiguous to but not in engagement with the curved face 69 of the wall or plate 70 in the base 2, the curvature of the face 69 being concentric with the axis of oscillation of the closer when the bucket has arrived at its "full-load" position, and so that as the closer returns to its shut position the regulator forms in connection with said curved plate a pocket adapted to contain a quantity of material sufficient to check the closing movement thereof.

It has been found in practice that the uniform record of the successive discharges or loads from the load-receiver is sometimes interrupted, and I therefore deem it expedient to provide means whereby the operation of the machine is positively checked whenever a discharge from said load-receiver has not been properly recorded by a register or analogous device.

To the side of the bucket G is secured a register R, the initial operating-shaft of which, as 71, has the usual actuator-arm 72, which is preferably connected by means of a rod or pitman 73 with the closer, as at 74, so that when the latter opens the arm 72 is swung upward to operate the register. The register R may be of any well-known type, and for this reason it is not considered necessary to describe the particular construction of the same.

Secured to the shaft 71 is an arm 75, which has a link connection with a latch 76, forming a part of another valve-controlling mechanism, (designated in a general way by E,) which is so constructed that it is non-effective when the register operates properly. The latch 76 is pivoted, as at 77, to a projection 78, formed on the standard or side frame 3, and it has a pin 79 operative in connection with the link 80, one end of which is attached to the above-mentioned arm 75. The rear end of the link 80 is preferably slotted to permit of a partial non-effective movement of the shaft 71 and its arm 75. Immediately above the fulcrum 77 of the latch 76 the latter is provided with a nose 81, adapted to be engaged by a detent-spring 82, attached to the projection 78 of the frame 2, and the nose 81 and spring 82^a are so arranged relatively to the fulcrum-axis 77 that in their normal conditions, as in Figs. 3, 4, and 7, the latch 76 will be thrown by said spring toward the thrust-rod 45, so that unless prevented the lower face, as 83, of said latch will be caused to engage a shoulder or other stop 45^a, formed on the thrust-rod 45 when the latter is in its lowermost position—*i. e.*, when the valve is entirely closed.

It will be observed that, as shown particularly in Figs. 7 and 8, the end of the spring 82 bears against the nose 81 of the latch 76 and normally tends to throw said latch inward, so that it will come in contact with the stop 45^a, and that when the latch is swung outward by the complete action of the register mechanism, as shown in Fig. 9, the engaging portion 82^a of the spring will retain said latch in such swung-out position until it is released therefrom and forced to return to its normal position by the pin or stop 86 on the thrust-rod 45 coming into contact with the arm 87 of the latch.

When the closer L opens, the arm 75 of the register will be actuated to swing toward the left, (see Fig. 3,) and unless such swinging movement is sufficient to withdraw the latch 76 and the lower face 83 thereof from a position above and in alinement with the shoulder 45^a, as shown in Fig. 8, the valve cannot be opened by its actuator B″ even after the closer has again resumed its closed position. It therefore follows that in order to render the several parts operative the arm 75 must swing sufficiently far not only to withdraw the latch 76 from above the stop 45^a, but also to bring said latch into such position that the spring 82 can act on the nose 81 thereof and retain said latch 76 in its swung-out position, a condition which can exist only when the shaft 71 of the register has been turned sufficiently to record the load last discharged. (See Figs. 5 and 9.)

As above mentioned, the closer must shut completely before the valve can be opened by the actuator, and hence it follows that means must be provided to retain the latch 76 in its swung-out position until the thrust-rod 45 has commenced to move upward, and for this reason the spring 82 is provided with an engaging portion 82^a, adapted to coöperate with one side of the nose 81 to keep the latch 76 in such position until the latter is positively released by an actuator preferably carried by the thrust-rod 45, and which actuator consists in the present instance of a pin 86, adapted to engage the under side of an arm 87, forming a part of the latch 76, and so positioned that during the final and complete opening movement of the valve the latch 76 will again be brought into a position where it may be operated by the spring 82^a to engage the stop-face 45^a of the thrust-rod 45.

The link 80 is, as above mentioned, slotted in order to permit of movement of the latch 76 when operated to return to its normal position by the pin 86, and in order to properly guide the lower end of the thrust-rod 45 I prefer to employ a link, such as 88, one end of which may be attached, as at 89, to the rod 45, while its other end may be pivoted, as at 90, to the side frame 3 of the machine.

No claim is made broadly to the register and means for connecting the same with the closer, for registers mounted on the load-receivers and connected with the closer in the manner illustrated and described have long been in use upon what are known as the

Pratt & Whitney weighing-machines, are disclosed in various patents in the prior art, and have also been in public use and on sale in this country for many years.

Many of the details of the machine may be widely varied without departing from my invention, and the register may be connected in a different manner with the valve-controlling means and still be within the scope thereof.

Claim is not made to the combination, with weighing mechanism including a load-receiver, of a closer for said load-receiver, a latch, a catch coöperative with the closer and with said latch, and valve mechanism controlled directly by the latch, for such broad subject-matter and its necessary adjunctive mechanism are set forth and claimed in my application filed August 21, 1897, Serial No. 649,027. It is also distinctly to be understood that the register may, if desired, be omitted. In other words, the lever and rod connections from the closer for governing the operation of the thrust-rod 45 may be employed without the register, when, if the closer should fail properly to open, the same result would, as is obvious, take place. It is also to be understood that my invention is not limited to the type of weighing-machine shown and described, for it could be readily applied with slight modification to those types of machines in which the bucket acts both as a load-receiver and a load-discharger and in which a closer is not required.

Having thus described my invention, I claim—

1. The combination, with weighing mechanism embodying a load-receiver having a closer, of a supply-valve; a valve-actuator; a register; means for actuating the same at each discharge of a load; and a latch adapted to engage the valve-actuator to prevent its operation after an incomplete discharge movement of the closer.

2. The combination, with weighing mechanism embodying a load-receiver having a closer, of a supply-valve; a valve-opening actuator; a latch; means for normally carrying said latch into engagement with said valve-opening actuator to prevent the proper operation thereof; and means whereby said latch is rendered non-effective upon the proper discharge of a load.

3. The combination, with weighing mechanism embodying a load-receiver having a closer, of a supply-valve; a valve-opening actuator; a latch; means for normally carrying said latch into engagement with said valve-opening actuator; means whereby said latch is rendered non-effective upon the proper discharge of a load; and a device for temporarily retaining said latch in such non-effective position.

4. The combination, with weighing mechanism embodying a load-receiver having a closer, of a supply-valve; a valve-opening actuator; a latch; means for normally carrying the latch into engagement with the valve-opening actuator to prevent the operation thereof; means whereby said latch is rendered non-effective upon the proper discharge of a load; a device for retaining said latch in a non-effective position; and means for returning the latch to its normal position during the opening movement of the valve.

5. The combination, with weighing mechanism embodying a load-receiver and a closer, of a valve; a valve-opening actuator; a latch normally tending to engage said actuator and to render the same non-effective; a register; means in connection and operative with the register for shifting the latch into a non-effective position; and means operated by the valve-opening actuator for returning the latch to its normal position.

6. The combination, with weighing mechanism embodying a load-receiver and a closer, of a valve; a valve-opening actuator; a latch normally tending to engage said actuator and render the same non-effective; a register; a slotted-link connection between the register and the latch; and means operated by the valve-opening actuator for returning the latch to its normal position.

7. In a weighing-machine, the combination, with a supply-valve, of a load-receiver having a closer; a latch for locking said closer in its shut position; interlocking stops for governing the movement of the valve; and means actuated by the closer-latch for operating one of said stops.

8. The combination, with a load-receiver having a closer, of a latch for locking the closer in its shut position; a stop carried by the load-receiver; a device intermediate the stop and latch; and supply mechanism the action of which is controlled by said stop.

9. In a weighing-machine, the combination, with a load-receiver, of a closer therefor having a plate with a curved surface; a latch engaging said plate and serving to lock the closer in its shut position; a stop carried by the load-receiver; a device connecting said stop and latch; a valve; and a stop carried by said valve and coacting with the stop on the load-receiver.

10. In a weighing-machine, the combination, with a load-receiver, of a closer having a plate with an eccentric face; a latch for engaging said plate and locking the closer in its shut position; means for tripping said latch; a pivoted stop carried by the load-receiver; a device connecting the stop and latch; a valve having a stop coöperating with the stop on the load-receiver; and means for actuating said valve.

11. In a weighing-machine, the combination, with a load-receiver, of a closer therefor; a skeleton plate having a curved eccentric surface; a latch pivoted to the load-receiver and adapted to engage said plate and lock the closer in its shut position; beam

mechanism for sustaining the load-receiver; means actuated by the beam mechanism for tripping the latch; a stop carried by the load-receiver; a device connecting said stop and said latch; a valve; a stop carried by the valve and coacting with the stop on the load-receiver; and means controlled by the beam mechanism for governing the movement of the valve.

12. In a weighing-machine, the combination, with a load-receiver, of a closer; a register mounted on the load-receiver; a device connecting said register and said closer; a valve; means for actuating said valve; and a device in connection and operative with the register for controlling the operation of the valve-actuating means.

13. In a weighing-machine, the combination, with a load-receiver, of a register; means for actuating said register; beam mechanism on which the load-receiver is mounted; a supply-valve; a device actuated by the beam mechanism for operating said valve; and means controlled by the register for preventing the action of the valve-operating device when the register fails to record a load.

14. In a weighing-machine, the combination, with a load-receiver having a closer, of a register mounted on the load-receiver and connected with the closer to be operated thereby when it opens to discharge a load; a supply-valve; a thrust-rod for opening said valve; and a device in connection and operative with the register for preventing the operation of said thrust-rod should the register fail to record a load.

15. In a weighing-machine, the combination, with a load-receiver, of a supply-valve; stop devices for controlling the movement of said valve; a closer; a latch for locking the closer in its shut position; a device connecting said latch with one of the stop devices; a register; means connecting said register with the closer; beam mechanism; means actuated by the beam mechanism for operating the supply-valve; and means coöperative with the register for preventing the opening movement of said valve should the discharged load fail to be recorded.

16. In a weighing-machine, the combination, with a load-receiver and valve mechanism for regulating the supply of material thereto, of means for actuating said valve mechanism; and a device in connection and operative with the register for preventing the action of such means should the register fail to record a load.

17. In a weighing-machine, the combination, with a load-receiver, of a register; means for actuating said register; a self-closing valve; a device for opening said valve; and means controlled by the register for preventing the operation of the valve-opening device should the register fail to record a load.

18. In a weighing-machine, the combination, with a load-receiver, of a closer for said load-receiver; a register mounted on the load-receiver and connected with the closer; a supply-valve; beam mechanism for supporting the load-receiver; a thrust-rod connected to the valve and adapted to be operated by a part of the beam mechanism; and a device in connection and operative with the register should it fail to record a load, and serving to prevent the operation of said thrust-rod.

19. In a weighing-machine, the combination, with a load-receiver, of beam mechanism for sustaining said load-receiver; a register, and means for actuating the same; a supply-valve; a device actuated by a part of the beam mechanism for operating said valve, said device having a stop or shoulder; and means coöperating with said stop and controlled by the register for preventing the operation of the machine should the register fail to act to record the load.

20. In a weighing-machine, the combination, with a load-receiver, of a register; means for actuating said register; a supply-valve; a thrust-rod for operating the same, said rod having a stop; a movable device coöperating with said stop; and means controlled by the register for permitting the action of the thrust-rod when the register acts properly to record a load; and a device actuated by the thrust-rod for throwing said movable device into contact with the stop on said rod.

21. In a weighing-machine, the combination, with a load-receiver, of a register supported thereby; a supply-valve; a thrust-rod for operating said valve, said rod having a stop; a spring-actuated device normally tending to engage with said stop; means for actuating the thrust-rod; and a slotted connection between said device and said register.

22. The combination, with a load-receiver, of a supply-valve; beam mechanism for sustaining the load-receiver; a thrust-rod having a stop; a pivoted latch; a spring for throwing said latch in one direction; and means in connection and operative with the register for operating said latch in the other direction.

23. The combination, with a load-receiver, of a pair of scale-beams for supporting the same, each beam consisting of a shaft portion and two unalined arms oppositely disposed to each other and located at opposite sides of the load-receiver, an arm of one of the beams being over, and in engagement with, an arm of the other beam at one side of the load-receiver, and an arm of the other beam being under the complemental beam-arm and at the opposite side of the load-receiver.

24. The combination, with a load-receiver, of a pair of scale-beams for supporting the same, each beam embodying two unalined arms located at opposite sides of the load-receiver, an arm of one of the beams being over an arm of the other beam at one side of the load-receiver, and an arm of the other beam being under its complemental beam-arm at the opposite side of the load-receiver.

25. The combination, with a load-receiver, of a pair of scale-beams for supporting the same, each beam embodying two unalined arms, having curved engaging portions, located at opposite sides of the load-receiver, an arm of one of the beams being over an arm of the other beam at one side of the load-receiver, and an arm of the other beam being under its complemental beam-arm at the opposite side of the load-receiver.

FRANCIS H. RICHARDS.

Witnesses:
WM. H. BLODGETT,
HENRY BISSELL.