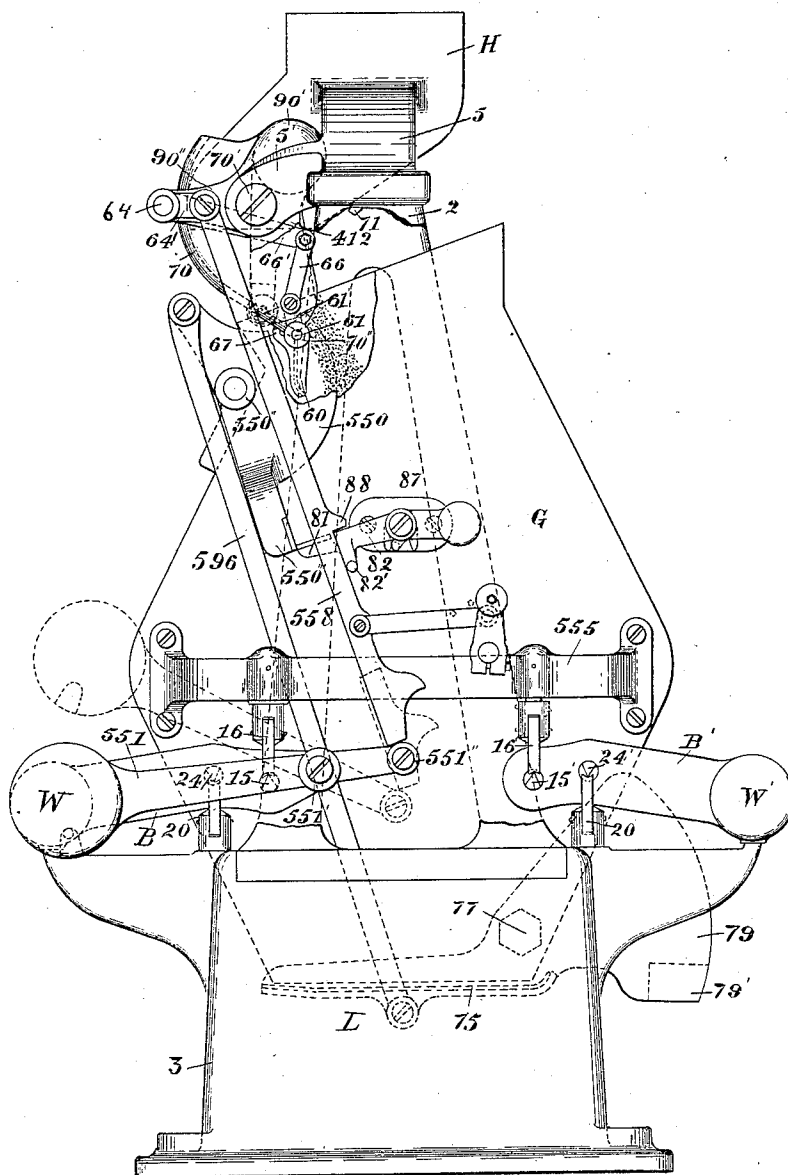


F. H. RICHARDS.
WEIGHING MACHINE.

No. 559,747.

Patented May 5, 1896.

Fig. 1.



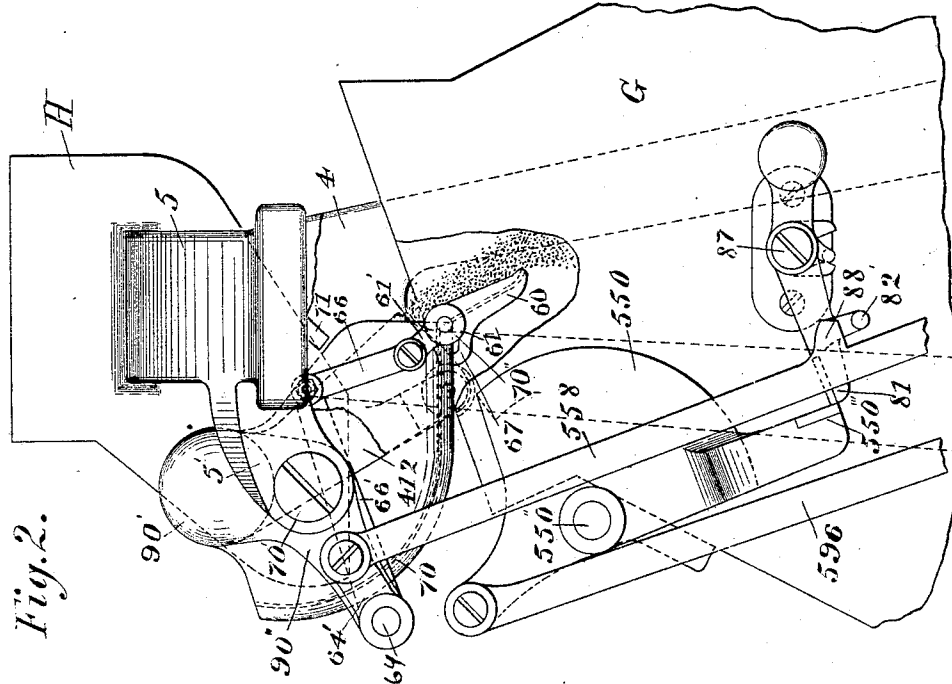
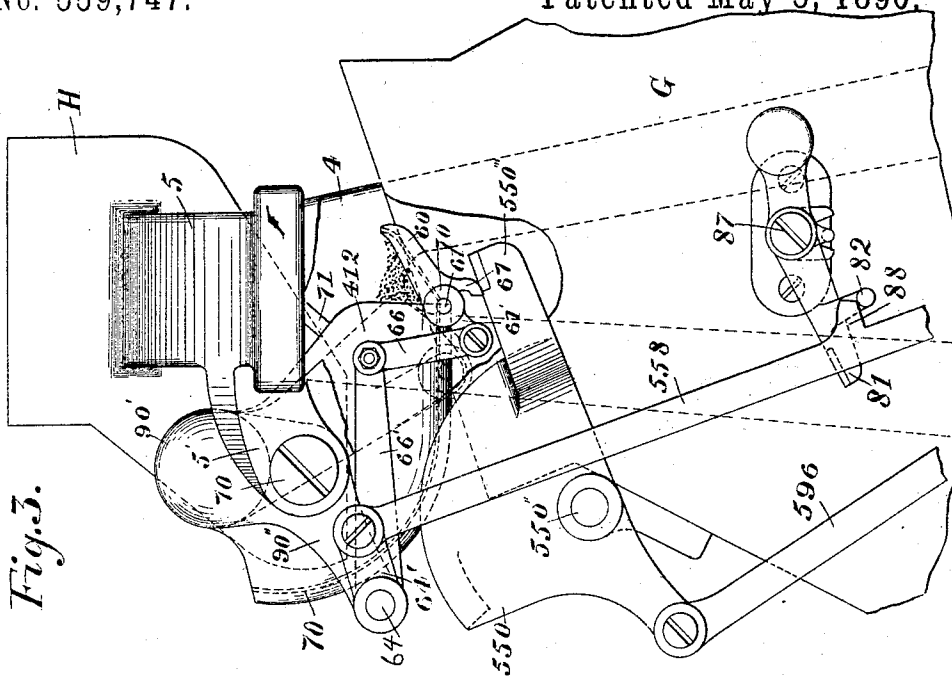
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(No Model.)

4 Sheets—Sheet 3.

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Fig. 5.

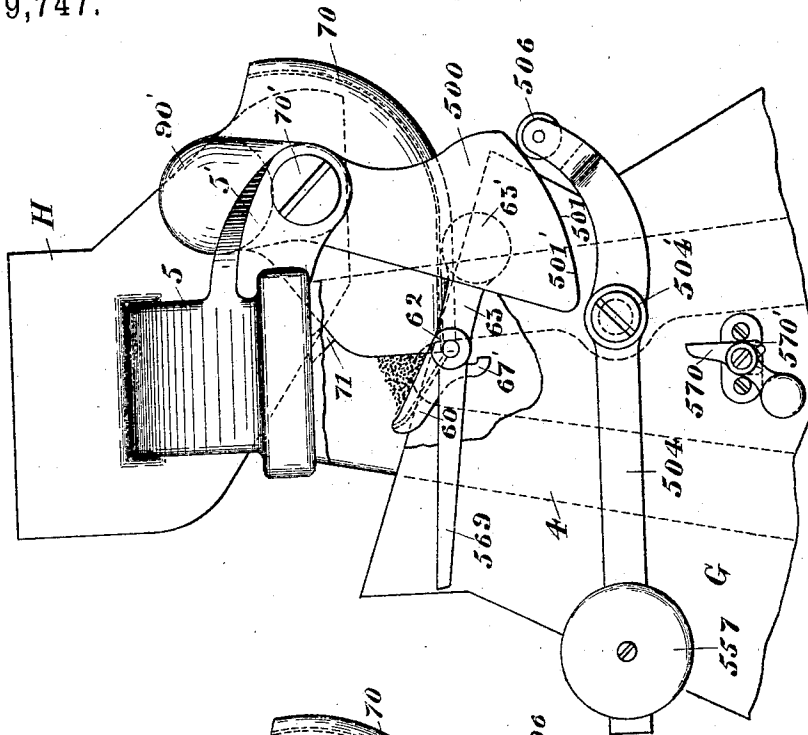
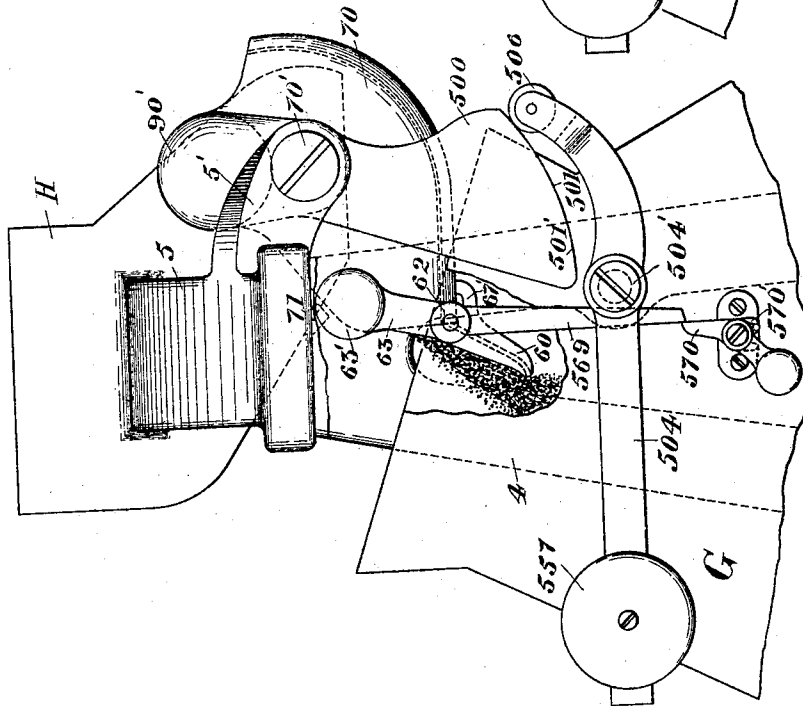


Fig. 4.



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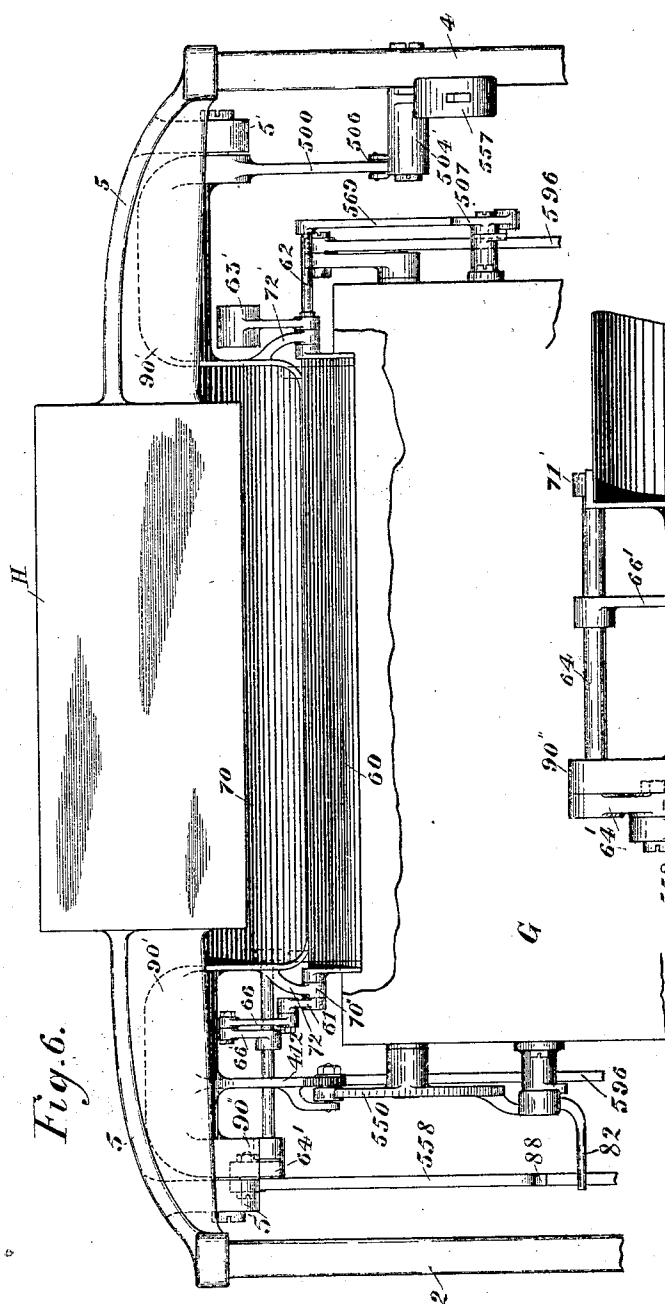


Fig. 6.

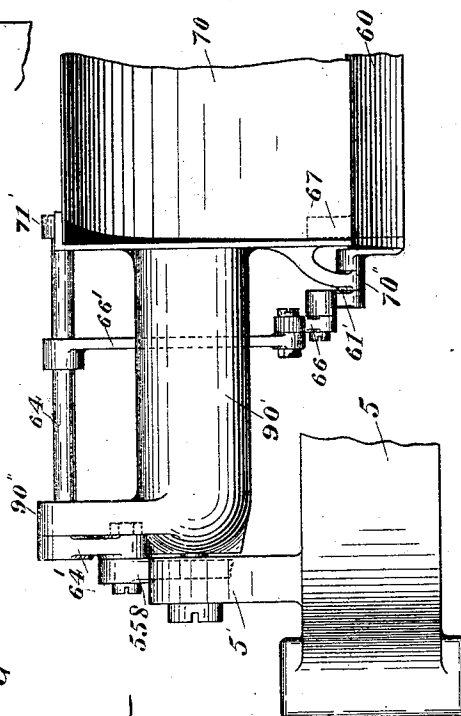


Fig. 7.

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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT.

WEIGHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 559,747, dated May 5, 1896.

Application filed November 26, 1895. Serial No. 570,195. (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.

My invention relates to weighing-machines, the object being to provide improved valve and valve-actuating mechanisms embodying, in part, a duplex supply-valve consisting of a main or reducing valve and a self-shifting supplemental or cut-off valve supported by the main valve for shifting movement relatively thereto.

In the drawings accompanying and forming part of this specification, Figure 1 is a right-hand end elevation of a weighing-machine embodying my present improvements, the machine being shown in the normal position thereof. Fig. 2 is a view similar to Fig. 1 of the upper part of the machine, showing a second step in the operation of the machine, the main valve having reduced the volume of the supply-stream to a drip, the supplemental valve being shown in the open position thereof to permit the flow of this reduced or drip stream into the bucket. Fig. 3 is a view similar to Fig. 2, illustrating a third step in the operation of the machine and showing the supplemental valve as having shifted from the position shown in the preceding view for cutting off or holding back the reduced or drip stream. Fig. 4 is an opposite end elevation of the upper part of the machine, and illustrates one form of detent mechanism for holding the supplemental valve against shifting movement. Fig. 5 is a view similar to Fig. 4, showing the supplemental valve as having been released by the detent mechanism. Fig. 6 is a front elevation of the upper part of the machine, with the valves in positions corresponding with Fig. 1. Fig. 7 is a plan view with the supply-chute and a portion of the top plate of the machine removed to better illustrate certain of the operative connections of the main and the supplemental valves and the valve-actuating mechanism.

Similar characters refer to like parts in all the figures of the drawings.

For the purpose of illustrating the nature and operation of my present improvements these are shown applied to a weighing-machine, which will be briefly described, and

which is constructed in accordance with several Letters Patent granted to me, certain of which Letters Patent will be hereinafter specified by dates and numbers, and to which reference may be had for a more extended description thereof.

The framework for carrying the operative parts of the machine may be of any suitable construction, and 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 supply chute or hopper, such as H, is shown secured by means of suitable holding devices.

The supporting-base 3 is shown carrying some suitable beam-supports, such as the V-shaped bearings 20 and 20', for supporting the beam mechanism, which latter carries the bucket mechanism, consisting of the bucket and its operative devices. There are shown in the drawings but two of the V-shaped bearings 20 and 20' and at the right-hand end of the base 3. It will be understood, however, that the opposite end of said base 3 will be similarly equipped.

As a means for supporting the bucket, which is designated in a general way by G, a pair of oppositely-disposed counterweighted beams are shown at B and B', respectively, pivotally mounted on the beam-supports, carried by the base of the machine by means of pivots or knife-edges, two of which are shown at 24 and 24', carried by one of each of the oppositely-disposed pairs of arms of said beams B and B'. The opposite arms of each of the scale-beams are also shown provided with pivots or knife-edges, which are supported by the beam-supports at the opposite end of the base 3. Each of the scale-beams B and B' is shown in the drawings having a pair of beam-arms joined by a combined connecting-shaft and counterpoise, the counterpoise for the beam B being designated by W and that for the beam B' by W'. The beam-arms carry suitable bucket-supports, four in number, two of which are illustrated at 15 and 15' as pivots or knife-edges, and these pivots are located between or intermediate the knife-edges 24 and 24'. The bucket G is illustrated carrying a hanger 555, which will be duplicated at the opposite end thereof, the hanger illustrated being shown provided with V-shaped bearings 16 and 16', which are pivotally sup-

ported by the knife-edges 15 and 15' of the beams B and B'. The opposite hanger (not shown) is also provided with V-shaped bearings pivotally supported by the knife-edges 5 carried by the opposite beam-arms (not shown) of the scale-beams B and B'.

My machine has the usual poising and counterpoising mechanisms. All that portion of the beam mechanism lying or located outside 10 of the knife-edges 24 and 24' constitutes the counterpoising mechanism of the machine, and all that portion of the beam mechanism intermediate of said knife-edges, including the bucket mechanism, which is supported 15 thereon for ascending and descending movements, constitutes the poising mechanism of the machine. The bucket mechanism embodies two members, one of which is shiftable relatively to the other for discharging the 20 bucket-load, and the bucket-closer L is shown herein constituting the shiftable member of the bucket mechanism. The bucket-closer L is shown consisting of a suitably-formed plate or closer proper, such as 75, which has 25 counterweighted plates at opposite ends thereof, which are formed integral therewith, one of these plates being illustrated at 79 and the weight thereon at 79'. These weights perform a dual function, tending, when the closer is open, to return the closer, on the complete 30 discharge of the bucket-load, to the closed position thereof, and serving also as stops for preventing too great an opening of the closer. The closer L is also illustrated as pivoted at 35 77 to the lower side of the bucket G and adjacent to one side of the discharge-opening thereof.

As a means for supporting the bucket-closer L an inverted toggle connection is shown in 40 the drawings connecting the closer and the bucket; and this toggle connection is so positioned as to be engaged by a closer-latch when the latch is in its operative position and the closer is shut. In the form illustrated this toggle connection comprises a suitable rocker, 45 such as 550, pivoted adjacent to the upper rearward side of the bucket and having a long connecting-rod 596, pivoted to said rocker and also to the closer in such a manner that, when 50 the closer is shut, the 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 by the bucket-closer latch 55 and held in that position the closer will be supported with a minimum pressure on the latch, as practically all of the weight of the bucket contents will be carried on the pivot 550'' of the rocker.

60 The closer-latch for locking the rocker in position when the closer is shut, and which is designated by 82, is shown herein pivoted at 87 on one end of the bucket G, and having a detent or stop 81, in position for engaging a 65 coöperating detent 550''' on the rocker 550 when the parts are in the closed position previously described. The bucket-closer latch

82 is shown counterweighted forward of the pivot thereof, and is limited in its movement toward the detent on the toggle connection by 70 means of suitable stops. The bucket-closer latch 82 in practice swings in an upward direction to engage the stop 550''' of the rocker 550, and it will be evident that said latch may be released from engagement therewith by a 75 downward movement or pressure.

The supply-chute H is adapted for containing the mass of material to be weighed, which may be supplied thereto in some well-known 80 manner, as by suitable elevator apparatus, and the supply-chute H will supply the bucket G with a stream of material termed the "supply-stream."

As a means for controlling the supply-stream flowing from the supply-chute a duplex 85 supply-valve is employed, and in the form thereof shown this duplex supply-valve consists of a main or reducing valve and a self-shifting supplemental or cut-off valve, supported by the main valve for movement relatively thereto. At the commencement of each 90 operation of the machine both of these valves will be in the open positions thereof to permit the unobstructed flow of the supply-stream into the bucket G. As the supply-stream flows 95 into the bucket this tends to slowly descend, and during the descending movement of the bucket the main valve will be slowly closed, gradually reducing the volume of the supply-stream until this is reduced to a drip-stream. 100 When the supply-stream is reduced to the proper size for the drip-stream, the movement of the main valve will then be intercepted by a suitable stop, said main valve thereby being 105 held positively against further closing movement. At this time the load in the bucket will be nearly completed. The drip or reduced stream will flow into the bucket for a relatively short period, for the purpose of completing the partial bucket-load therein, and 110 when the bucket-load is completed the supplemental valve, which controls the drip-stream, and which had heretofore been held against movement, being released, will instantly shift, thereby cutting off the drip-stream and pre- 115 venting its flow into the bucket G.

The main valve is illustrated at 70, and is substantially similar to the improved valve disclosed and claimed in Letters Patent No. 535,727, granted to me March 12, 1895. This 120 main valve is shown pivoted at 70' for oscillatory movement between the arms or brackets 5', projecting from the top plate 5 of the machine. The valve employed is illustrated as located beneath the mouth of the supply- 125 chute and as extending beyond the forward edge thereof sufficiently far to support the descending column or stream when the valve is closed. This valve 70 is also preferably 130 balanced, so as to have normally no tendency either to open or close, the balance-weight being shown at 90', extending from opposite ends of the valve-pan.

As a means for closing the main valve I pre-

fer to employ valve-actuating mechanism substantially similar to that disclosed and claimed in Letters Patent No. 548,843, granted to me October 29, 1895, and this mechanism will now be described. A lever is shown at 504, pivoted at 504' to the side frame 4 and having at the rear of the pivot an antifric-tion-roller 506, adapted to engage the cam-surface 501, of the proper curvature, of a cam 500 and to oscillate said cam, (this being operative with the main valve 70,) and thereby said valve in a direction for closing the same. This lever 504 is shown counterweighted at its forward end, the counterweight thereof being illustrated at 557. At the commencement of the operation of the machine the roll 506 will be at about the point 501' of the cam-face 501, and on the descent of the bucket the counterweighted lever 504, through the roll riding over said cam-face 501, closes the valve 70 for reducing the volume of the supply-stream to a drip. It will be remembered that the main valve 70 has been described as having a gradual closing movement for reducing the volume of the supply-stream to a drip-stream, at which time the movement of said main valve is intercepted and held against further closing movement for permitting the flow into the bucket of this reduced or drip stream. At the close of the reducing period said main valve 70 will be positively held against further closing movement, and for this purpose I prefer to employ a stop or abutment carried by some fixed part of the machine, such as the framework thereof. For this purpose a stop is illustrated at 71, carried by the top plate or beam 5 of the framework, and in such a position as to engage the main valve 70, and thereby hold the same against further closing movement to permit the flow into the bucket of the reduced stream, the supplemental valve at this time being in its open position.

The supplemental valve is illustrated at 60, pivotally supported adjacent to the discharge edge 70" of the main valve 70 for movement relatively to the main valve.

As a means for supporting the supplemental valve the end walls of the main valve 70 are each shown provided with a bracket or arm (designated, respectively, by 72 and 72') secured thereto, and in which are formed journal-openings for the reception of the pintles or pivots 61 and 62, formed on the ends of the supplemental valve 60 and adjacent to the discharge edge of the main valve, the pintle 62 being shown extended for a purpose hereinafter described.

During the major part of the operation of the machine the supplemental valve will be transversely disposed relatively to and below the main-valve plate, and thereby out of the path of the supply-stream, this relation continuing until the close of the poising period, when the supplemental valve will be released and it will be projected in an upward direction for cutting off the drip-stream. The extended pintle 62 of the supplemental valve

60 is shown having secured thereto, for movement therewith, a counterweighted arm 63, the counterweight thereof being illustrated at 63', this counterweight illustrating a means for shifting or imparting a closing movement to the supplemental valve when this is released for cutting off or holding back the drip or reduced stream.

As a means for opening the main and the supplemental valves to again permit the flow of the supply-stream into the bucket the following means is illustrated. A shiftable member having two movements is shown. This shiftable member is in operative relation with the main and the supplemental valves and has two movements, a shifting movement from its normal position, and operative, on its return stroke or movement, for opening the main and the supplemental valves. There is shown at 558 a relatively long depending rod, which is operatively connected with the main and the supplemental valves, and the lower end thereof is so positioned as to be engaged by said shiftable member or valve-opening actuator, to thereby impart a valve-opening thrust to said connecting-rod 558 for synchronously opening the main and the supplemental valves. The supplemental valve 60, it will be remembered, has been described as supported for shifting movement adjacent to the discharge edge of the main valve, and a connecting-rod 558 has also been described as operatively connected with the main and the supplemental valves and as having the lower end thereof in position to be engaged by a valve-opening actuator. The supplemental valve 60 is illustrated as provided at each end thereof with stops 67 and 67', which, when pressure is exerted on the inner end of the supplemental valve, will abut against the main-valve plate, and, for the time being, make the supplemental valve 60, when pressure is thus exerted, a fixed part or extension of the main valve 70. The balance-weight 90' is illustrated as having projecting rearwardly therefrom an arm or bracket 90'', in which is formed a journal-opening, and the main valve 70 at the rear thereof is also provided with a rearwardly-projecting arm or lug 71', having also a journal-opening in alinement with the journal-opening formed in the rearwardly-projecting arm 90'' of the balance-weight 90', these openings being for the reception of the rock-shaft 64, which is shown supported for rocking movement therein.

The outer end of the rock-shaft 64 is shown provided with a short crank or rock arm 64', secured thereto, to which is shown pivotally secured the long connecting-rod 558, which has been described as constituting the means for transmitting the valve-opening thrust to the main and the supplemental valves of a valve-opening actuator, which latter will be hereinafter more fully described.

The rock-shaft 64 is shown operatively connected with the supplemental valve, and the connections illustrated will now be described.

The pintle 61 of the supplemental valve 60 is shown provided with a short crank-arm 61, secured thereto, which latter in turn is illustrated as pivotally connected with the link 5 66, the latter being also illustrated as pivotally connected with the relatively long crank 66', the opposite end of which is shown as fixedly secured to the rock-shaft 64.

The scale-beam B is shown carrying a supplemental counterpoise 551, which is shown at 551' pivoted to the poising side of said beam, and this counterpoise normally exerts its force on the counterpoise side of said beam, suitable stops being employed for maintaining this relation, but is shiftable from the counterpoising mechanism and onto the poising mechanism. On the return stroke or movement thereof this shiftable member is operative for imparting a valve-opening thrust, through the connecting-rod 558, to the main and the supplemental valves for opening the same, said supplemental counterpoise being illustrated as provided with an antifriction-roll 551'' for engaging the lower end of the 25 connecting-rod 558.

As the stream flows into the bucket G and this gradually fills it tends slowly to descend. As the bucket descends the beam mechanism also descends, and the latter descending will 30 permit the supplemental counterpoise 551 to fall slowly from under the connecting-rod. The connecting-rod 558 also has a descending movement with the supplemental counterpoise, and as these descend the valve-closing actuator will be effective for closing the main valve 70. The connecting-rod 558 therefore 35 also constitutes a valve-movement stop for controlling the closing movement of the main valve 70 by the valve-closing mechanism thereof, and also effectually limits and checks the shifting movement of the supplemental valve by the operative connections illustrated between said supplemental valve 60 and the connecting-rod 558. The natural tendency 45 of the supplemental valve 60 is to have a self-shifting movement for cutting off the reduced stream; but this tendency of the supplemental valve 60 will be positively prevented by the shiftable member through the connecting-rod 558, which is operatively connected with 50 the supplemental valve 60 through the rock-shaft 64 and the connecting members 66 and 66'. The opposite movement of the supplemental valve will be prevented by the fixed stops 67 and 67', which abut against the main-valve plate on the descending movement of the bucket.

It will be remembered that the movement of the main valve 70 is intercepted at the 60 close of the reducing period or commencement of the poising period to permit the flow into the bucket of a reduced or drip stream for the purpose of completing the partial bucket-load. It will be apparent then that 65 when the main valve 70 is so held the connecting-rod 558 will also be held against further descending movement. It will be ob-

vious also that the supplemental counterpoise will have a descending movement away from or will fall from under the connecting-rod 70 558, thereby releasing the supplemental valve 60, at which time it will be in condition to shift for cutting off the drip or reduced stream. Means, however, are employed for preventing this shifting movement of the supplemental valve when it is released by the valve-movement stop 558, whereby the duration of 75 flow of the drip-stream into the bucket will be positively controlled, and for this purpose the detent mechanism shown is preferably employed. The extended pintle 62 of the supplemental valve 60 is shown provided with 80 a depending arm 569 operative therewith, and which will be preferably secured thereto. The lower end of this depending arm will be engaged by a suitable stop or detent carried 85 by the poising mechanism of the machine at the commencement of the poising period, and at the close of the poising period this cooperating stop or detent will release the said 90 arm 569, at which time the supplemental valve 60, being free of all restraint, will be caused to shift upwardly by its counterweight to cut off the drip-stream.

The stop or detent for engaging the depend- 95 ing arm 569 of the supplemental valve 60 is illustrated at 570 as a by-pass stop, which is shown pivoted to the bucket G for oscillatory movement thereon. This by-pass stop is provided with a counterweight below the pivot 100 thereof, and the bucket is illustrated as carrying a stop 570', the function of which is to engage the lower or counterweighted arm of the by-pass to hold this arm positively against movement when engaged by the depending 105 arm 569 at the proper point in the operation of the machine. The length of the upper arm of the by-pass 570, relatively to the depending arm 569 of the supplemental valve, is such that said arm 569 will be engaged at 110 the commencement of the poising period, and when the supplemental valve is released, to hold the supplemental valve 60 against shifting movement, and to also release the arm 569 at the close of the poising period—that 115 is, when the bucket has reached and gone below the poising-line on the completion of the bucket-load—whereby said supplemental valve may have its shifting movement for cutting 120 off the drip-stream. On the opening movement of the main and supplemental valves this depending arm 569 will simply swing the by-pass 570 about its pivot and will thereby be permitted to resume its normal position. On this shifting movement of the 125 supplemental valve 60 the connecting-rod 558, through the operative connections therewith, will be projected downwardly into engagement with the supplemental counterpoise 551, whereby on the succeeding operation of 130 the machine the latter may be effective for synchronously opening the main and the supplemental valves, to again permit the flow of the supply-stream into the bucket. It will

be remembered that a latch 82 has been described for holding the bucket-closer L against movement, and for releasing the closer I prefer to employ a releaser device operated by and from the power of the supplemental valve, which releaser device, in the form thereof herein shown, has a movement into position for engaging a pin or stop carried by said latch for tripping the same to thereby release the closer L. The latch 82 is shown provided with a stop or pin 82', carried by the latch at the rear of the pivot 87 thereof, and the connecting-rod 558, which is operative with the supplemental valve, is shown provided with a releaser device 88, and it will be apparent that on the downward projection of the connecting-rod 558 by the supplemental valve 60 this releaser device 88, which is operated by and from the power of the shifting supplemental valve, will be carried into engagement with the stop 82', carried by the latch 82, this action tripping the latch and releasing the latch and rocker detents. When these detents have been disengaged, it will be apparent that the closer L is free to open, and the bucket-load being complete the weight of the mass in the bucket and resting on the closer will be instantaneously effective for opening the same to thereby discharge the bucket-load.

Reciprocally effective valve and closer opening movement stops are shown at 412 and 550, which are operative for reciprocally limiting the movements of these members, said stops being operative when the closer is open for limiting the opening movement of the valve, and vice versa. It will be assumed that the connecting-rod 558 has been projected downwardly in the manner described and into engagement with the supplemental counterpoise, and that the bucket-load has been discharged, the closer closed, and that the supplemental counterpoise 551 has been shifted onto the poising side of the scale-beam B. It will be remembered that on the return stroke this member 551 has been described as operative for opening the main and the supplemental valves.

On the initial movement of the supplemental or shiftable-member counterpoise 551, as this returns to the normal position thereof, an upward thrust is imparted to the connecting-rod, and the crank-arm 64' will be given a partial revolution, thus rocking the shaft 64 in its bearings to the rear of the main-valve pivot. As the shaft 64 rocks, the members 66 and 66' will be distended, and the latter will rock the rock-arm 61', connected to the pintle 61 of the supplemental valve, simultaneously rocking or imparting a return shifting movement to the supplemental valve 60 in its bearings to return the same to the normal position thereof, as indicated in Fig. 1. But a partial thrust is necessary to return the supplemental valve to its normal or opening position, at which time the stops 67 and 67', abutting against the main-valve plate,

prevent further shifting movement of the supplemental valve, and also prevent rocking movement of the rock-shaft 64 in its bearings at the rear of the center of movement of the valve or valve-axis. At this period in the operation of the machine the crank-arm 64' will have assumed an approximately vertical position, so that on the further ascending movement of the shiftable member 551 the thrust thereof will be applied to the rear of the main valve 70 through the connecting-rod 558, the crank-arm 64', and the rock-shaft 64, so that when this shiftable member 551 has resumed its normal position, as indicated by the full lines in Fig. 1, this shiftable member will have opened both the main and the supplemental valves.

Having thus described my invention, what I claim is—

1. In a weighing-machine, the combination with a supply-chute; of a duplex valve therefor consisting of a main valve and a supplemental valve supported thereby and a valve-closing device carried by said supplemental valve.

2. In a weighing-machine, the combination with a supply-chute, of a duplex valve therefor embodying a main valve and a supplemental valve movably supported on said main valve; a depending member operatively connected with each of said valves; and a valve-opening actuator operable for engaging said member.

3. In a weighing-machine, the combination with a supply-chute; of a supply-valve therefor consisting of a main valve and a supplemental valve supported by the main valve for movement relatively thereto; and a counterweight carried by the supplemental valve and operative for closing the same relatively to the main valve.

4. In a weighing-machine having poising mechanism, the combination with a supply-chute; of a supply-valve therefor consisting of a main valve and a supplemental valve supported by the main valve for shifting movement relatively thereto; and a detent carried by the poising mechanism for holding said supplemental valve against shifting movement at the commencement of the poising period, and for also releasing said supplemental valve at the close of the poising period, to thereby permit the same to shift.

5. In a weighing-machine, the combination with a supply-chute for supplying a stream of material; of a main valve having a stream-reducing movement; a stop located to intercept the main valve during the reducing period to thereby permit the flow of a reduced stream; and a supplemental valve supported by the main valve for shifting movement relatively thereto; and means for actuating the supplemental valve for cutting off said reduced stream of material without further movement of the main valve.

6. In a weighing-machine, the combination with a supply-chute; of a supply-valve there-

for consisting of a main valve having a stream-reducing movement and a supplemental valve supported by said main valve for shifting movement relatively thereto; and a stop carried by a fixed part of the machine for intercepting the movement of the main valve during the stream-reducing movement thereof.

7. In a weighing-machine, the combination with a supply-chute; of a supply-valve therefor comprising a main valve and a supplemental valve supported by the main valve for shifting movement relatively thereto; means for shifting the supplemental valve; and a stop normally operative for limiting said shifting movement of the supplemental valve.

8. 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 bucket-load; of a supply-chute for supplying a stream of material to the bucket; a supply-valve for controlling said stream of material, and consisting of a main valve and a supplemental valve supported by the main valve for shifting movement relatively thereto; valve-actuating mechanism; and a releaser device operated by and from the power of the closing supplemental valve, and having an effective movement for releasing the shiftable member of the bucket mechanism on the shifting movement of said supplemental valve.

9. In a weighing-machine having poising mechanism, the combination with a supply-chute; of a supply-valve therefor consisting of a main valve and a supplemental valve supported by the main valve for shifting movement relatively thereto; a stop normally operative for preventing the shifting movement of the supplemental valve and for also releasing the same; and a detent carried by the poising mechanism and operative on the release of the supplemental valve to also hold the same against shifting movement, and operative also for releasing said supplemental valve to thereby permit the shifting movement thereof.

10. In a weighing-machine, the combination with a supply-chute; of a supply-valve therefor consisting of a main valve and a supplemental valve supported thereon for shifting movement; and a stop carried by the supplemental valve, and operative for preventing reverse shifting movement of said supplemental valve.

11. In a weighing-machine, the combination with a supply-chute; of a supply-valve therefor consisting of a main valve and a supplemental valve supported by the main valve for movement relatively thereto; a connecting-rod operatively connected with the main and the supplemental valves, and also constituting a stop for limiting one of the valve movements; and a shiftable member for engaging said connecting-rod and having descending and ascending movements, whereby on the descending movement of said member the same will fall from under the con-

necting-rod, to thereby permit the closing movements of the main and the supplemental valves, and whereby on the ascending movement thereof said member will be operative for imparting a valve-opening thrust, through said connecting-rod, to the main and the supplemental valves for opening the same.

12. In a weighing-machine, the combination with a supply-chute; of a supply-valve therefor consisting of a main and a supplemental valve, supported by the main valve for movement relatively thereto, said main valve having brackets on the end walls and having said brackets provided with journal-openings, and said supplemental valves having pintles for bearing in said openings, one of which pintles is extended; and a weight carried by said extended pintle.

13. In a weighing-machine, the combination with a supply-chute; of a supply-valve therefor consisting of a main and a supplemental valve supported by the main valve for shifting movement relatively thereto; a connecting-rod operatively connected with the main valve; and links operatively connecting the connecting-rod with the supplemental valve; and a two-movement member operative on one of its movements for engaging said connecting-rod, to thereby impart simultaneous opening movements to the main and the supplemental valves.

14. In a weighing-machine, the combination with a supply-chute; of a supply-valve therefor consisting of a main valve and a supplemental valve supported thereon for movement relatively thereto; a rock-shaft carried by the main valve; links operatively connected with the rock-shaft and the supplemental valve; a connecting-rod operatively connected with the rock-shaft; and a shiftable member having two movements and operative on one of the movements thereof for imparting a valve-opening thrust to said connecting-rod, whereby the same will be effective for opening the main and the supplemental valves.

15. In a weighing-machine, the combination with a supply-chute; of a supply-valve therefor consisting of a main valve and a supplemental valve supported thereon for shifting movement relatively thereto; a crank-arm carried by the supplemental valve; a rock-shaft carried by the main valve; links connecting the rock-shaft with the crank-arm of the supplemental valve; a crank-arm carried by the main-valve rock-shaft; a connecting-rod connected with said rock-shaft; and a shiftable member having two movements, and operative on one of its movements for imparting a valve-opening thrust to said connecting-rod, whereby the latter will, through said operative connections with the main and the supplemental valves, open the said main and supplemental valves.

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