E. D. CARTER.

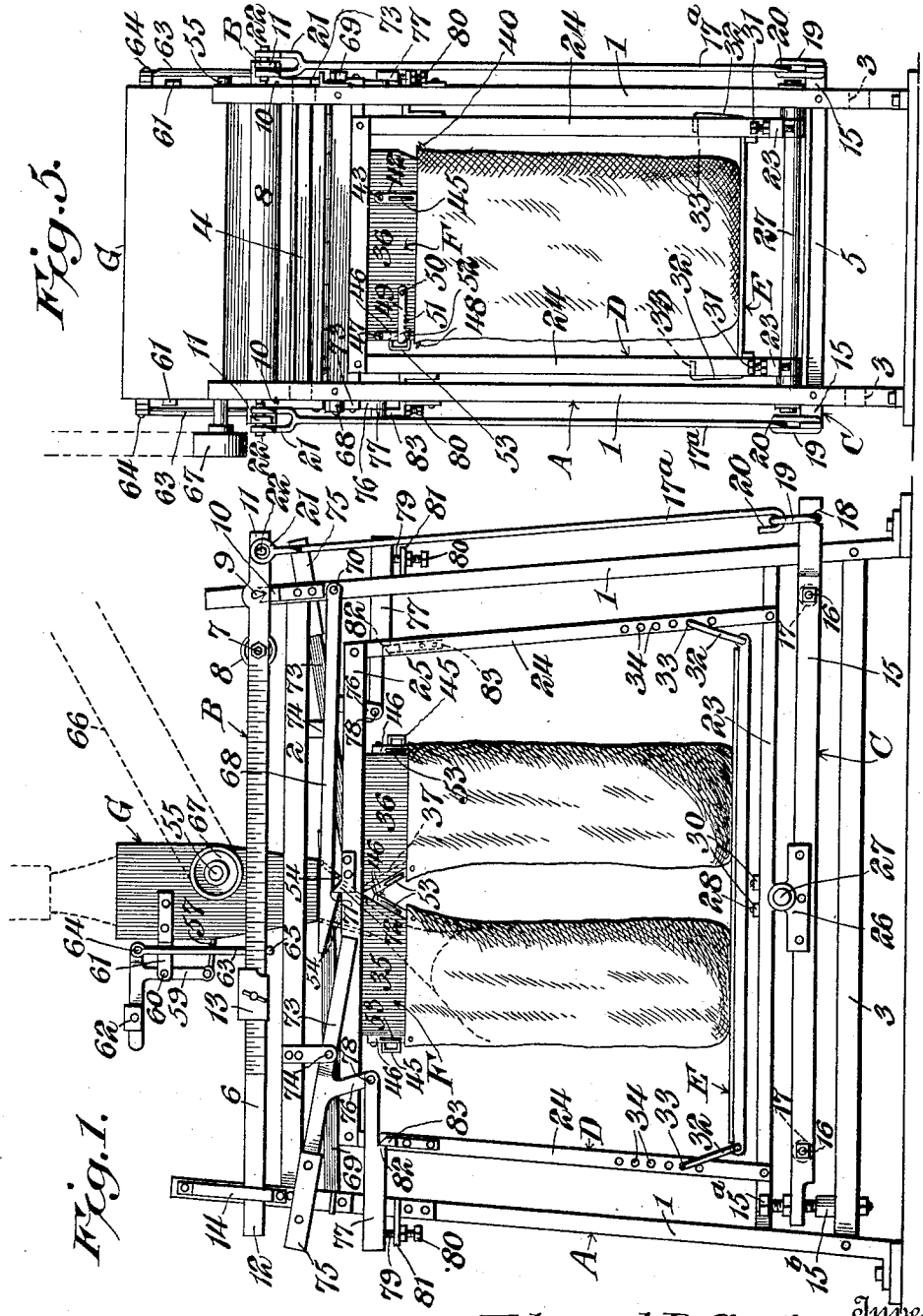
AUTOMATIC SACK FILLING AND WEIGHING MACHINE.

APPLICATION FILED MAR. 22, 1910.

1,007,848. Patented Nov. 7, 1911.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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4 SHEETS—SHEET 2.

Fig. 11.

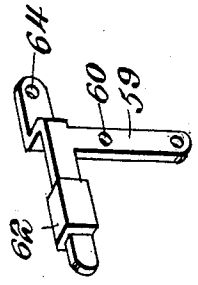


Fig. 12.

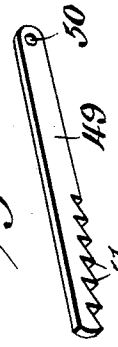


Fig. 13.

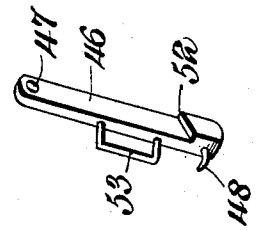
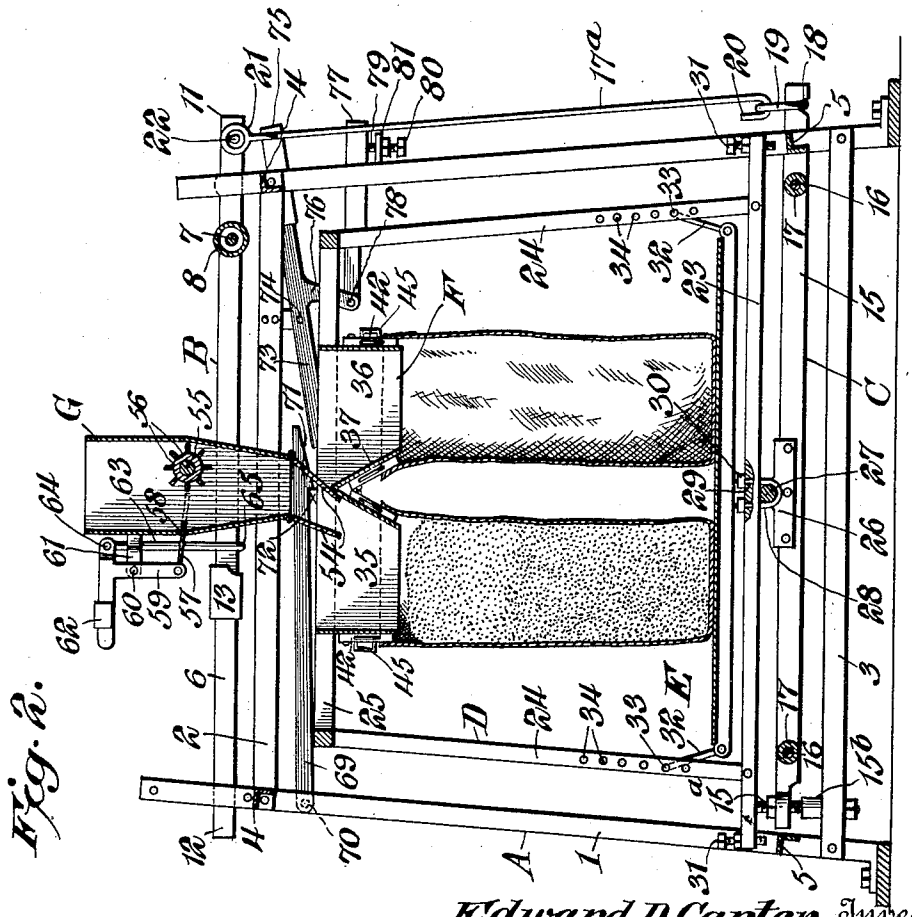


Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 6.

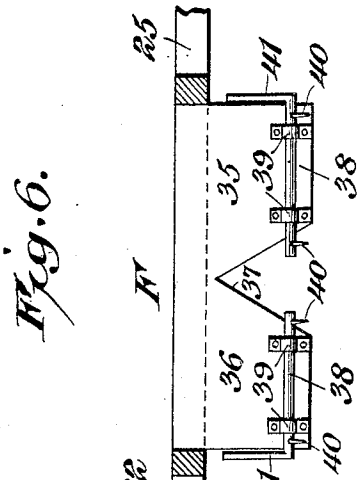


Fig. 7.

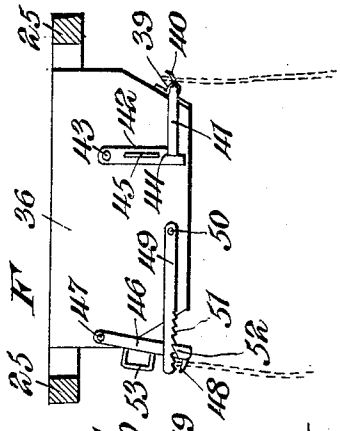
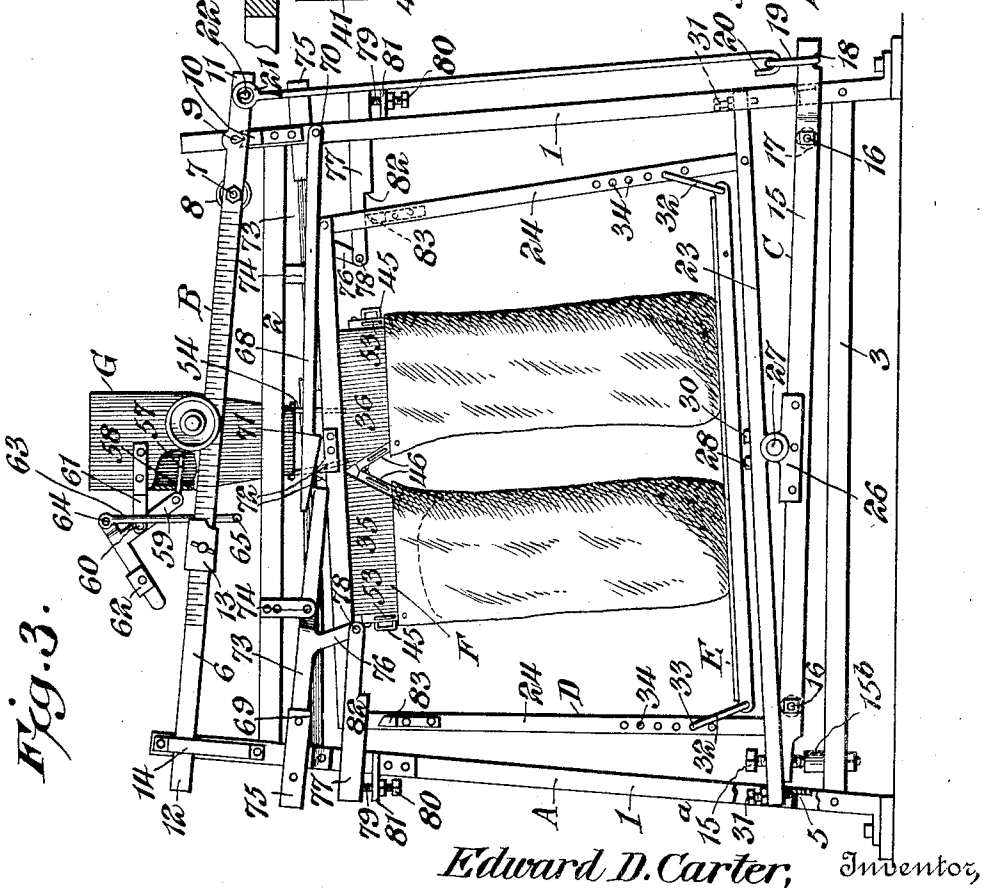


Fig. 3.



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4 SHEETS—SHEET 4.

Fig. 9.

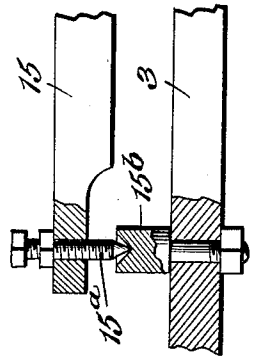


Fig. 10.

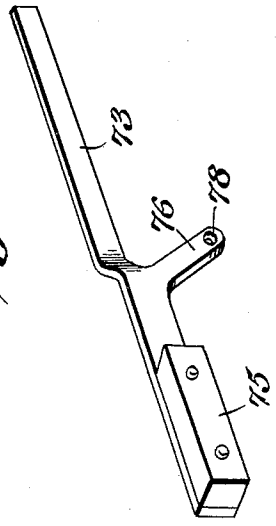


Fig. 4.

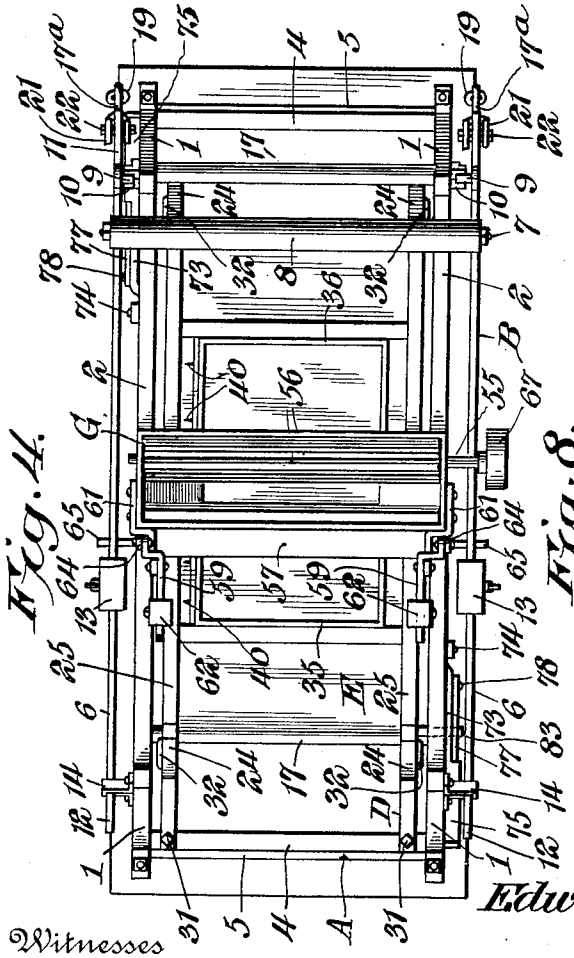
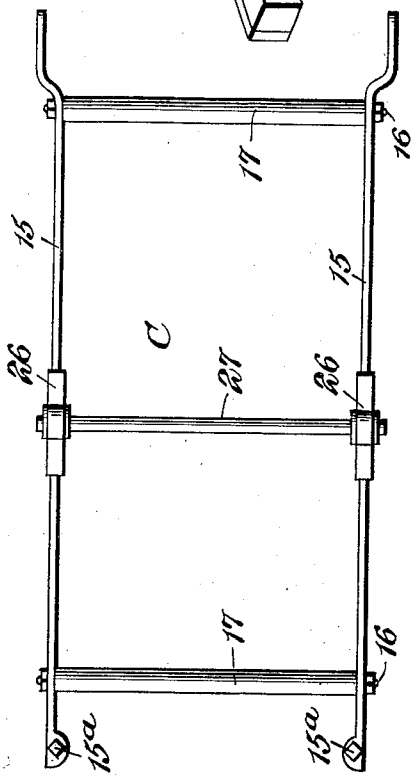


Fig. 8.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC SACK FILLING AND WEIGHING MACHINE.

1,007,848. Specification of Letters Patent. Patented Nov. 7, 1911.

Application filed March 22, 1910. Serial No. 550,991.

To all whom it may concern:

Be it known that I, EDWARD D. CARTER, a citizen of the United States, residing at Houston, in the county of Harris and State of Texas, have invented a new and useful Automatic Sack Filling and Weighing Machine, of which the following is a specification.

This invention relates to sack filling and weighing machines of the automatic type, such for instance, as is disclosed in United States Letters Patent No. 895,160, granted to me August 4, 1908.

The invention has for one of its objects to improve the construction and operation of machines of this character so as to be comparatively simple and inexpensive to manufacture, reliable and efficient in use, and entirely automatic in operation, except as to the placing and removing of the sacks.

A further object of the invention is the provision of an improved sack-holding and hopper-carrying frame connected with the beam scales of the machine, in combination with a single feed spout under which the hoppers are alternately placed for filling the bags successively.

Another object of the invention is the employment of means for controlling the feed of material during the final stage of filling a sack, so that the feed can be diminished gradually for effecting accurate weighing.

With these objects in view and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one embodiment of the invention, Figure 1 is a front view of the machine showing the same with the parts in position during the filling operation. Fig. 2 is a vertical longitudinal section showing one of the bags almost filled and prior to the tipping of the scale beam. Fig. 3 is a front view showing the scale beam tipped and the platform frame tilted for removing the filled bag from and placing the empty bag under the feeding spout. Fig. 4 is a plan view of the machine. Fig. 5 is an end view thereof. Fig. 6 is a front view of the hopper. Fig. 7 is a side view thereof. Fig. 8 is a plan view of the swinging frame or lever on which the platform-carrying frame is mounted. Fig. 9 is an enlarged detail view showing one of the fulcrums for the swinging frame. Fig. 10 is a perspective view of the latch-releasing device for the oscillatory platform frame. Fig. 11 is a perspective view of the weighted lever of the feed cut-off device. Figs. 12 and 13 are perspective views of parts of the sack gripping device of the hopper.

Similar reference characters are employed to designate corresponding parts throughout the views.

Referring to the drawings, A designates the main frame of the machine which comprises corner legs or uprights 1 connected together by top and bottom side bars 2 and 3, and top and bottom end bars 4 and 5 which form a rigid skeleton-like framework preferably of angle iron. At the top of the frame is a swinging scale frame designated generally by B which is composed of side beams 6 connected rigidly together by a bolt 7 around which is arranged a tube 8 that forms a spacer between the side scale beams 6. The corresponding ends of the scale beams are provided with knife edge pivots 9 which engage in V-shaped bearings 10 on the standards at one end of the main frame so as to swing on a horizontal axis. The pivots 9 are located inwardly from one end of the beams so as to provide short arms 11 and long arms 12 on which latter sliding weights or poises 13 are provided, the weights being adjusted with respect to the scale marks on the beams. The free extremities of the long arms are movable in vertical guides 14 on the uprights of the frame at the end of the machine opposite from the fulcrum point 9. At the bottom of the main frame is a swinging frame C to which the short arm of the scale beam frame B is connected. The swinging frame C is composed of side bars 15 which are connected together by transverse bolt rods 16 on which are sleeves 17 that form spacers. This rigid rectangular frame is fulcrumed at the end opposite from the fulcrumed end of the scale beam frame, while the free end of the frame C is connected by rods 17^a with the short arm of the scale beam frame. The side bars 15 of

the frame C are bent laterally to extend outside the legs of the main frame and are provided with notches 18 to form seats for upwardly-extending links 19 to which the hooked ends 20 of the rods 17[a] are engaged. The upper ends of the rods 17[a] terminate in bearing eyes 21 in which engage knife-edge pivots 22 extending laterally from the scale beams 6 of the scale frame B. While the swinging lever C and beam of the machine are preferably constructed as frames, it is to be understood that the invention is not necessarily limited to these features.

Disposed between the lever C and beam B is an oscillatory frame D that forms a carrier for the platform E and the hopper F. The frame D consists of spaced bottom side bars 23 to which are connected the lower ends of corner standards 24 that have their upper ends connected with top side bars 25 between and to which the hopper F is secured. This frame tilts on a centrally-disposed transverse axis at the bottom thereof. For this purpose, the side bar 15 of the frame or lever C is provided with bearings 26 in which is supported a horizontal shaft 27. The side bars 23 of the oscillatory frame are connected with this shaft by U-shaped clips 28, Fig. 2, which span the shaft and pass through openings 29 in the side bars 23 and are held in place by nuts 30. The side bars 23 project beyond the uprights 24 and terminate over the horizontal end bars 5 of the main frame A, Fig. 2, and these projecting extremities have adjustable stops 31 in the form of set screws so disposed as to engage the cross bars to limit the tilting movement of the oscillatory frame.

As shown in Fig. 9, the frame C has its side bars provided with fulcrum screws 15[a] that have their lower ends pointed and resting in cupped bearings 15[b] on the side bars 3 of the main frame. These screws 15[a] can be turned to raise or lower the fulcrumed end of the frame C to properly adjust the same with respect to the scale beam.

Arranged immediately above the side bars and extending between the standards of the oscillatory frame is the horizontal sack-supporting platform E which can be adjusted vertically toward or from the hopper for adapting the platform to bags of different lengths. To this end, the extremities of the platform are provided with links 32, the upper ends 33 of which can be hooked at different places on the standards 24, the standards being provided with spaced apertures 34 or equivalent means for receiving the hooks 33.

The hopper F is composed of two sections or compartments 35 and 36 which are of similar construction and symmetrically disposed with respect to the transverse vertical plane passing through the axis on which the oscillatory frame tilts. The hopper sections are separated by an inverted V-shaped partition 37 which has special reference to the feed chute or spout, as will be hereinafter more fully described. The lower ends of the hopper sections receive the open ends of the bags to be filled. Each hopper section has on its rear side a bag-gripping device in the form of a horizontal rock shaft 38, Figs. 6 and 7, mounted in the bearings 39 on the hopper and equipped with teeth 40 which pierce the sack or bag. Each rock shaft has a handle or crank arm 41 disposed at the end of the hopper and adapted to swing downwardly to an approximately horizontal position when it is automatically engaged by a gravity-locked catch 42, Fig. 7. This catch has its upper end pivoted at 43 on the end wall of the hopper and is recessed at its lower end to form a shoulder 44 which engages over the crank arm when the latter is depressed.

The catch is provided with a handle 45 whereby it can be released when disengaging the bag from the gripping device. When the rear bag-gripping device is released, the teeth are approximately in vertical position, so that the bag can be presented thereto, and by the rocking of the tooth-carrying shaft, the teeth are turned to an approximately horizontal position for sustaining the weight of the bag. During this rocking of the shaft for gripping the bag, the free end of the crank arm 41 strikes the latch 42 and swings the same laterally out of its vertical position until the lower end of the latch is reached, when the same swings back to its normal position to engage the shoulder over the crank arm for locking the latter. Each hopper section is provided with a front bag-gripping device which consists of levers or frames 46, each fulcrumed at 47 at its upper end on the hopper, and has one or more bag-gripping teeth 48 at its lower end. These levers can swing inwardly or outwardly to adjust themselves to bags of different widths and each is held in locked position by a toothed member 49 fulcrumed at 50 and having ratchet teeth 51 which engage a tooth 52 on the lever or frame 46. The teeth 51 are so shaped that the tooth 52 can ride over them as the lever 46 is swung outwardly to grip the bag, so that the member 49 will automatically lock the lever in place. When the bag is to be released, the free end of the member 49 is raised to disengage the teeth thereof from the tooth of the lever to thereby permit the latter to be moved inwardly for releasing the teeth or hooks 48 thereof from the bag. The lever 46 has a forwardly-extending handle 53 whereby it can be conveniently manipulated. These adjustable devices for engaging the mouth of the bag, taken in connection with the adjustable platform, render the weighing machine adaptable for sacks or bags of different dimensions.

Rigidly supported in any suitable manner over the center of the machine is a feed chute or spout G through which material continuously flows to one bag or the other, according to which hopper section is under the chute. The lower end of the chute is equipped with means for directing the grain into the inner hopper section, said means consisting, preferably, of hinged doors or gates 54 hinged at their upper ends to opposite sides of the chute. These gates are of such length that one or the other will rest on the apex of the V-shaped partition 37 between the hopper sections to direct the grain or material into one of the hopper sections, while closing communication between the chute and other hopper section. The other gate is moved laterally by the incoming material so as not to interrupt the flow. In the chute G is arranged a horizontal rotary feeder 55 which has longitudinally-extending pockets 56 in its circumference. This rotary feeder coöperates with a cut-off in the form of a plate 57 to diminish the feed of material through the chute during the final stage of the filling of the bags. The plate 57 moves inwardly and outwardly through an opening 58 in the side of the chute and is connected with a lever 59 disposed outside the chute and fulcrumed at 60 on the bracket 61 which is carried by the chute. This lever has a weight 62 so arranged as to tend to throw the plate 58 inwardly toward the valve to cut off the flow between the valve and plate. The scale beam serves to hold the cut-off device 57 in open position by means of a hook 63 which is hingedly connected at 64 to the lever and has its lower, laterally-bent end 65 disposed under the scale beam, so that as long as the latter is down, the cut-off device will be open. As soon as the scale beam rises, as shown in Fig. 3, the weight 62 comes into play to tilt the lever 59 in such a direction as to move the cut-off device 57 into proximity to the valve. The valve is continuously rotated by a belt 66 running over a pulley 67 connected with a valve or equivalent means, Fig. 1, so that the pockets thereof will successively discharge their contents into the bag after the cut-off device is closed, until the oscillatory bag-carrying frame is fully tilted and the position of the hopper changed, when the filling of the empty bag takes place. As soon as the scale beam drops to normal position, the cut-off device will be opened so as to permit the maximum flow of material to the new bag. By a feed-regulating means of this character, the weighing of the material supplied to the sacks can be accurately and quickly accomplished. The cut-off device forms a coarse feed regulator, while the rotary valve serves as a fine feed regulator, and these are automatically brought into play as the conditions for weighing the material require; that is to say, when the bag is almost filled, the coarse feed regulator is closed and as soon as the empty bag is presented to the chute, the coarse feed regulator is opened for establishing the maximum flow of material through the chute. The valve being constantly rotated, serves as an agitator to prevent the clogging of material in the chute, in addition to its function as a fine feed regulator.

During the major part of the filling operat on of the bag, the oscillatory frame is level or in a horizontal position, but as soon as the bag is filled, the oscillatory frame lowers by the weight of material overcoming the poises 13 of the scale beam and causing the beam B to swing upwardly and the lever C to swing downwardly. After this downward movement takes place, the oscillatory frame suddenly tilts in one direction or the other, according to the position of the filled bag, for shifting the empty bag under the feed chute. The oscillatory frame is held in normally central position by a pair of hooks 68 and 69 disposed at the front and rear of the machine, respectively, and reversely arranged. The outer end of the hook 68 is fulcrumed at 70 on the front right leg 1 of the main frame, while the outer end of the rear hook is fulcrumed on the left rear leg of the main frame. The free ends of these hooks terminate at the transverse medial plane of the machine and each is provided with a shoulder 71 for engaging a catch 72 on each upper side bar 25 of the oscillatory frame, the front catch 72 being reversely disposed to the catch 72 on the rear top side bar. The front hook 68 prevents tilting of the oscillatory frame to the left, while the rear hook 69 prevents tilting of the frame to the right. These centralizing devices or levers are adapted to be automatically released as the bags are alternately filled. Each hook is released by a lever 73 fulcrumed at 74 on the main frame and carrying at its outer end a weight 75. The lever 73 has a depending arm 76 at one side of the fulcrum point 74, and connected with said arm is a latch device 77 in the form of a horizontally-disposed member hingedly connected at 78 with the arm 76 and normally resting on a stop 79 which is an adjustable screw 80 carried by a bracket 81 on the main frame. This latch 77 has a shoulder 82 at its bottom that is engaged by a catch 83 on the adjacent standard 24 of the oscillatory frame. When the oscillatory frame tilts to the left, Fig. 1, the catch 83 moves the latch 77 laterally to raise the weighted end 75 of the lever 73 so that the inner end of the lever will be moved away from the hook 68 in order to impart a hammer blow thereto as soon as the weighted end of the lever is allowed to drop by the disengagement of the catch 83 from the

shoulder 82. This disengagement of the catch is effected by the downward movement of the swinging frame or lever C when the poises 13 are overbalanced by the filled sack of the platform. The time when the disengagement occurs can be adjusted by turning the set screw 80 to thereby raise the latch member 77.

In practice, the long arm of the scale beam B will be down when the machine is idle and the platform E raised. The front and rear hooks 68 and 69 will engage their respective catches 72 so as to maintain the platform horizontal. Bags are applied to the hopper, as shown in Fig. 1, and the feed through the chute G is opened. One bag or the other is supplied with material, according to the position of the gates 54. In the present instance, the left bag is filling, and during the filling, the platform tends to tilt to the left but is arrested by the front hook 68, and as the filling continues, the weight 75 of the front lever will be held in raised position by the latch 77 engaging the catch 83. After the bag has received the desired amount of material, the scale beam will rise and allow the swinging frame C and oscillatory frame to drop. The catch 73 is thus disengaged from the latch 77, with the result that the lever 73 quickly releases the front hook 68 so that the oscillatory frame D suddenly tilts to the position shown in Fig. 3 for removing the filled bag from and placing the unfilled bag under the feed chute. The attendant then removes the filled sack and applies an empty one to the hopper in its place while the filling of the second bag takes place. As soon as the filled bag is removed, the beam drops and the frames C and D return to their normal position. During this movement, the oscillatory frame is arrested in its central position by the rear lever 69 engaging its catch 72, and also the rear catch 83 moves into engagement with the shoulder 82 of the rear latch 77 and moves the latter to the right, Fig. 3, to bring the hook-releasing lever 73 into position for striking the rear hook 79 when the right hand bag is filled and the platform depressed. This filled bag is then taken away and an empty one substituted while the filling of the third bag takes place without interruption. It will thus be seen that the bags are alternately filled while a continuous feed is maintained through the spout, and all that is required of the attendant is to remove the filled sack and place the empty ones on the hopper.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. In a weighing machine, the combination of a supporting structure, a swinging element fulcrumed thereon, a swinging scale beam fulcrumed on the structure, an oscillatory frame mounted on the element and disposed between the same and beam, means on the frame for holding a plurality of sacks, a feed hopper, and a mechanism for holding the frame in position for permitting the chute to discharge into any sack and to automatically permit the oscillatory frame to shift under the weight of the filled sack for placing an empty sack under the chute.

2. In a weighing machine, the combination of a supporting structure, a swinging element mounted thereon, a scale beam on the structure, means for operatively connecting the beam and element, an oscillatory frame carried wholly on the element and including sack-holding means, a feed chute disposed above the said means, and mechanism for permitting the frame to automatically tilt by the weight of a filled bag for removing such bag from under the chute and placing an empty bag thereunder.

3. In a weighing machine, the combination of a supporting structure, an element fulcrumed thereon, a scale beam spaced above and connected with the element, an oscillatory frame, means for mounting the same on the element to rise and fall therewith and to tilt independently thereof, means on the frame for holding bags side by side, a fixed continuously discharging chute arranged above the bag-holding means, devices for holding the frame in position for filling one bag at a time from the chute, and automatically actuated means for releasing the devices to permit the frame to tilt for moving the filled bag from and placing the empty bag under the chute.

4. In a weighing machine, the combination of a supporting structure, a swinging element, a weighing beam disposed above the element, a connection between the beam and element whereby the element falls as the poise-carrying arm of the beam rises, an oscillatory supporting frame carried by and disposed above the element, means on the frame for holding sacks side by side, a feed chute disposed above the said means, devices for holding the frame in central position during the filling of a bag, and means for automatically releasing either device upon the downward movement of the element to

permit the frame to tilt under the weight of the filled bag for bringing the unfilled bag under the chute.

5. In a weighing machine, the combination of a supporting structure, a frame having one end fulcrumed on the structure, a scale beam fulcrumed on the structure, a link connecting the beam with the frame, an oscillatory platform-carrying frame centrally fulcrumed on the first frame, means for limiting the tilting of the second frame, bag-holding devices carried by the second frame, a feed chute disposed over the devices, means for holding either device under the chute, and means for automatically releasing the devices as the first frame falls to permit the second frame to oscillate under the weight of the filled bag for bringing the empty bag in line with the chute.

6. In a weighing machine, the combination of a supporting structure, a swinging frame composed of connected side bars, means for fulcruming the frame on the structure, bearings on the side bars, an oscillatory frame supported by the bearings, a platform on the oscillatory frame, a bag-holding means spaced above the platform and mounted on the oscillatory frame, and means for filling the bags successively through the tilting of the oscillatory frame.

7. In a weighing machine, the combination of a supporting structure, a frame fulcrumed at one end thereon, a scale beam, a connection between the beam and frame, adjustable fulcrums for the frame, a tiltable platform carried by the frame, bag-holding devices disposed in fixed relation to the platform, a feed chute, and automatically released devices for shifting the bag-holding means under the chute for successively filling the bags.

8. In a weighing machine, the combination of a scale beam, a swinging element, a connection between the beam and element, an oscillatory frame carried by the element, an adjustable platform on the frame, a bag-holding means mounted on the frame in such position as to rest the bottom ends of the bags on the platform, a material feeding chute disposed above the said means, and devices for holding the oscillatory frame stationary during the filling of a bag and adapted to be automatically released upon the downward movement of the element for permitting the frame to tilt under the weight of the filled bag.

9. In a weighing machine, the combination of a supporting structure, a swinging element, a frame wholly carried thereby, a platform on the frame, hoppers disposed above the platform and arranged side by side, bag-holding means on the hoppers for receiving the mouth ends of the bags while the lower ends rest on the platform, automatically set devices for holding the frame stationary during the filling of a bag and permitting the frame to lower with the element when the bag is filled, and automatically operated means for releasing each device to permit the frame to tilt under the weight of the filled bag for throwing an empty bag to filling position.

10. In a weighing machine, the combination of a supporting structure, a depressible and oscillatory frame, a scale beam connected with the frame for holding the same raised, a bag-holding platform on the oscillatory frame, hoppers on the frame disposed above the platform, means on the hoppers for fastening bags thereto, and devices released by the lowering of the frame to permit the latter to tilt under the weight of the filled bag for removing the latter from filling position.

11. In a weighing machine, the combination of a supporting structure, a swinging element thereon, an oscillatory frame mounted on the element, a vertically adjustable platform on the oscillatory frame, a plurality of bag-receiving hoppers supported on the frame above the platform, devices for holding the oscillatory frame in central position, a supply chute, means on the supply chute for directing material into either hopper, a scale beam for holding the element and attached part raised, and means for releasing the devices when the frame lowers with the element under the weight of the filled bag to permit the frame to oscillate for removing the filled bag from and placing an empty bag under the supply chute.

12. In a weighing machine, the combination of a supporting structure, an oscillatory and vertically movable frame, a platform on the frame, a scale beam connected with the frame for holding the same raised, a fixed supply chute disposed above the frame, a plurality of hoppers disposed side by side and movable under the chute, oppositely-disposed devices arranged to hold the oscillatory frame in central position during the filling of a bag and permitting the frame to fall under the weight of a filled bag, and means for automatically releasing the devices upon the lowering of the frame to permit the latter to oscillate under the weight of the filled bag for transferring an empty bag under the chute.

13. In a weighing machine, the combination of a supporting structure, an oscillatory and vertically-movable frame, a scale beam operatively connected with the frame for holding the same raised, a fixed supply chute, bag-holding means on the frame movable under the chute, oppositely-disposed hooks mounted on the structure, devices on the frame with which the hooks engage for maintaining the frame in central position during the filling of the bag, and devices for releasing either hook after the lowering of

the frame to permit the latter to tilt under the weight of the filled bag for throwing an empty bag under the chute.

14. In a weighing machine, the combination of an oscillatory frame mounted for vertical movement, a scale beam operatively connected with the frame to hold the latter raised, a fixed feed chute, hoppers disposed side by side and movable under the chute and supported on the frame, devices for holding the frame against oscillation during the filling of a bag, and gravity-actuated means for disengaging the devices to permit the frame to oscillate for removing the filled bag from and placing an empty bag under the chute.

15. In a weighing machine, the combination of a supporting structure, an oscillatory frame mounted to rise and fall, a scale beam for counterbalancing the frame, a supply chute, a hopper for holding a plurality of bags on the frame and movable under the chute as the frame tilts, oppositely-disposed hooks mounted on the structure, catches on the frame with which the hooks automatically engage to hold the frame stationary during the filling of a bag, devices for releasing the hooks after the frame lowers, and means for holding the devices in operative position while the frame is raised.

16. In a weighing machine, the combination of a supporting structure, an oscillatory frame mounted on the structure to rise and fall, a scale beam for counterbalancing the frame, means for holding bags side by side on the frame, a material supplying means, hooks mounted on the structure, catches on the frames with which the hooks are held in engagement by gravity, gravity-operated devices for releasing the hooks, and means for permitting the devices to operate to release the hooks upon the lowering of the frame to thereby permit the latter to oscillate to throw an empty bag under the feed means.

17. In a weighing machine, the combination of a supporting frame, a structure mounted thereon for oscillatory and vertical movement, a scale beam mounted on the frame and connected with the structure to counterbalance the same, bag-holding means fixed on the structure to move therewith, a material feeding chute disposed over the said means, devices mounted on the frame for holding the structure level during the filling of a bag, weighted elements for releasing the devices, members connected with the elements, and means on the structure for engaging the members to hold the elements in position to strike the said devices after the structure moves backwardly to permit an empty bag to move under the chute by the oscillation of the structure.

18. In a weighing machine, the combination of a supporting frame, a structure mounted to tilt on a horizontal axis, means for movably mounting the axis, a scale beam connected with the said means, devices for holding a plurality of bags on the structure, oppositely disposed elements arranged to engage the structure to hold the same stationary in central position during the filling of a bag, striking members for releasing the elements, latch devices connected with the members, and catches on the structure for engaging the latches to releasably hold the striking members in operative position, said catches being released from the latches by the downward movement of the structure.

19. In a weighing machine, the combination of a supporting structure, a swinging element fulcrumed thereon, an oscillatory frame mounted on the element, a platform disposed in the bottom of the frame, bag-holding means mounted on the top of the frame for supporting bags on the platform, a material feeding chute disposed above the frame, hooks pivoted at their outer ends to the said structure and extending inwardly along the frame, catches on the frame with which the hooks engage for preventing tilting in either direction during the filling of the bags, separate releasing devices for the hooks, and means on the frame for actuating either device to permit the frame to oscillate under the weight of the filled bag for transferring an empty bag under the chute.

20. In a weighing machine, the combination of a vertically-movable and oscillatory bag-holding frame, a supporting structure therefor, a scale beam connected with the frame and mounted on the structure, oppositely-disposed centering elements arranged at opposite sides of the machine and pivotally connected at their ends to the structure, devices on the frame with which the free ends of the elements engage to hold the frame level during the filling of a bag, and mechanism automatically moved and held in operative position by the frame for releasing either element to permit the frame to tilt after moving downwardly under the weight of the filled bag to move the empty bag to filling position.

21. In a weighing machine, the combination of a supporting structure, a vertically-movable and oscillatory frame mounted on the structure, a scale beam, a connection between the beam and frame, centrally-disposed catches on the upper part of the frame, hooks pivoted at their outer ends on the structure and having their inner ends disposed to engage the catches for holding the frame level, levers mounted on the structure to release the hooks, weights tending to actuate the levers, and means for releasing either lever upon the downward movement of the frame to permit the latter to tilt by the preponderance of weight on one side of the axis of the frame.

22. In a weighing machine, the combination of a supporting structure, a vertically-movable and oscillatory bag-carrying frame, a scale beam operatively connected with the frame, centrally-disposed catches on the frame, hooks pivoted at their outer ends on the structure and maintained in engagement with the catches by gravity to hold the frame horizontally, a centrally-disposed feed chute, levers fulcrumed on the structure, and devices for operating the levers to release the hooks upon the downward movement of the frame to permit the latter to tilt under the weight of the filled bag to throw an empty bag under the feed chute.

23. In a weighing machine, the combination of a supporting structure, a bag-carrying frame mounted to rise and fall and to oscillate on a horizontal axis, a scale beam connected with the frame and mounted on the structure, devices for releasably holding the frame in horizontal position, weighted levers mounted on the structure for releasing the devices, members hingedly connected with the levers, adjustable supports for the members, catches on the frame for engaging the members to move the levers to operative position and arranged to release the members on the downward movement of the frame to permit the latter to oscillate under the weight of the filled bag, and a feed hopper coöperating with the oscillatory frame to successively fill the bags on the latter.

24. In a weighing machine, a movable bag holding frame, a scale beam connected therewith, a feed chute, means for constantly delivering material from the chute, and a cut-off plate movable transversely of the feed chute toward and from the means for constantly delivering material from the chute, said plate being controlled in its movement by the beam for diminishing the flow through the chute at the final stage of the filling of the bag.

25. In a weighing machine, a movable scale beam, a feed chute, a rotary feeder in the chute, and a plate movable transversely of the chute toward and from the rotary feeder and controlled by the beam to diminish the flow through the chute during the final stage of the weighing operation to the capacity of the feeder.

26. In a weighing machine, a scale beam, a fixed feed chute, a rotary pocketed feeder mounted in the chute near one side thereof, and a cut off plate movable transversely of the chute toward and from the feeder and controlled by the beam, the plate and feeder coacting to diminish the feed through the chute at the final stage of weighing.

27. In a weighing machine, a scale beam, a feed chute, a rotatable feeding device in the chute at one side thereof, a weighted lever pivotally connected to the feed chute, connections between the lever and the scale beam, and a slidable plate movable transversely of the feed chute toward and from the rotatable feeding device by the action of the movement of the scale beam on the weighted lever.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

EDWARD D. CARTER.

Witnesses:
D. C. DUNN,
J. P. SCRONTON.