July 5, 1927.

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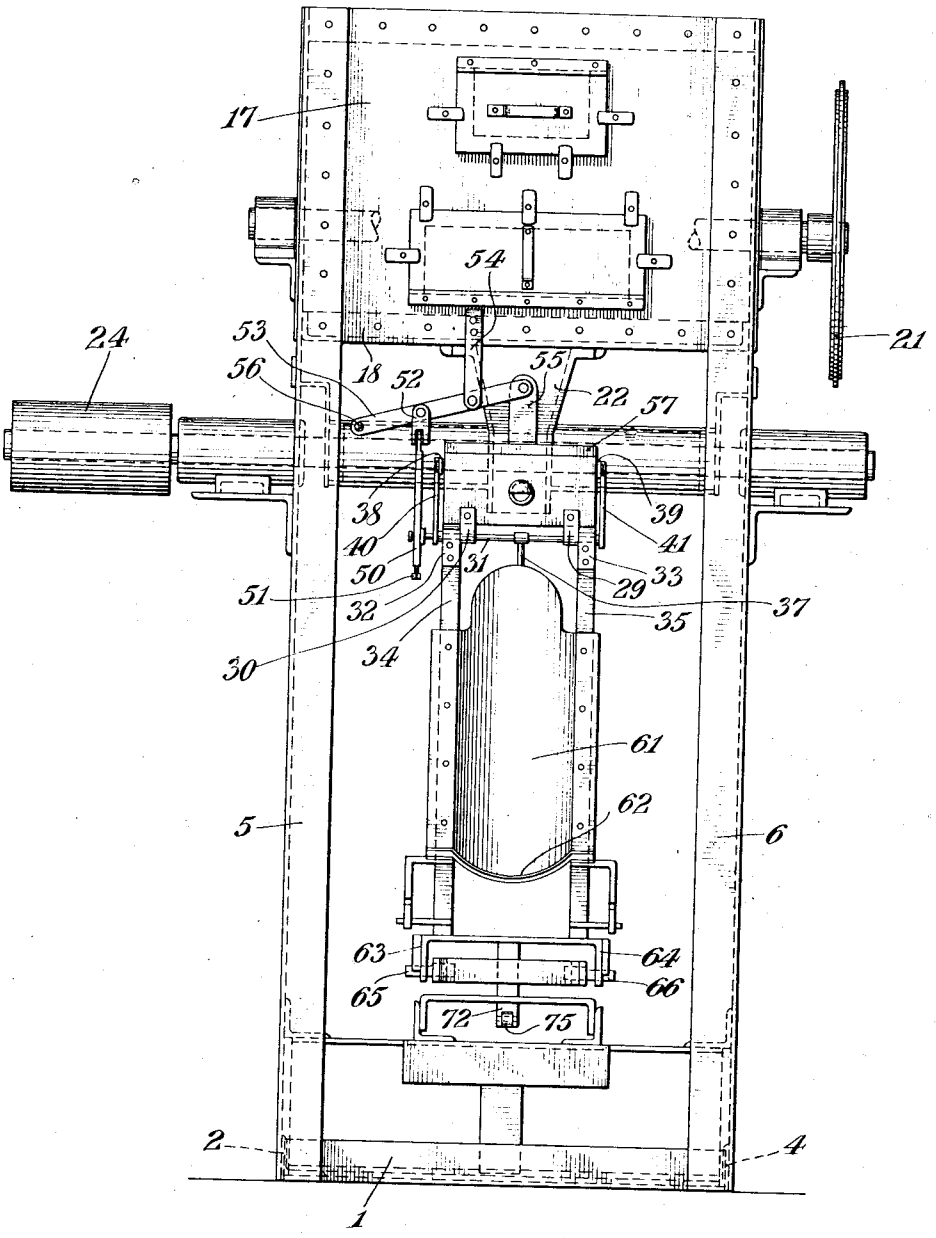
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BAG FILLING MACHINE

Filed May 15. 1925

4 Sheets-Sheet 1

Fig. 1.



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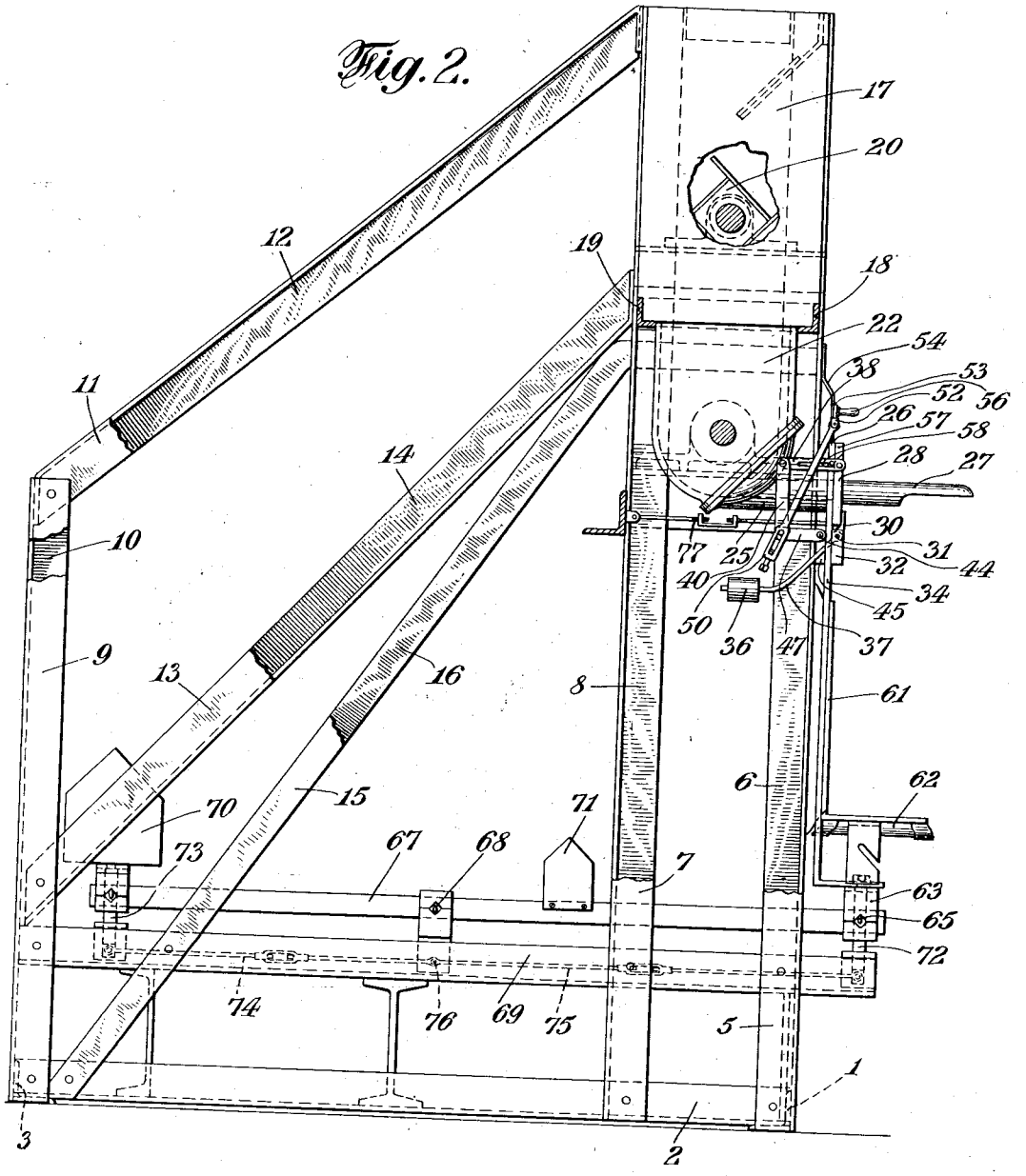
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Fig. 2.



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BAG FILLING MACHINE

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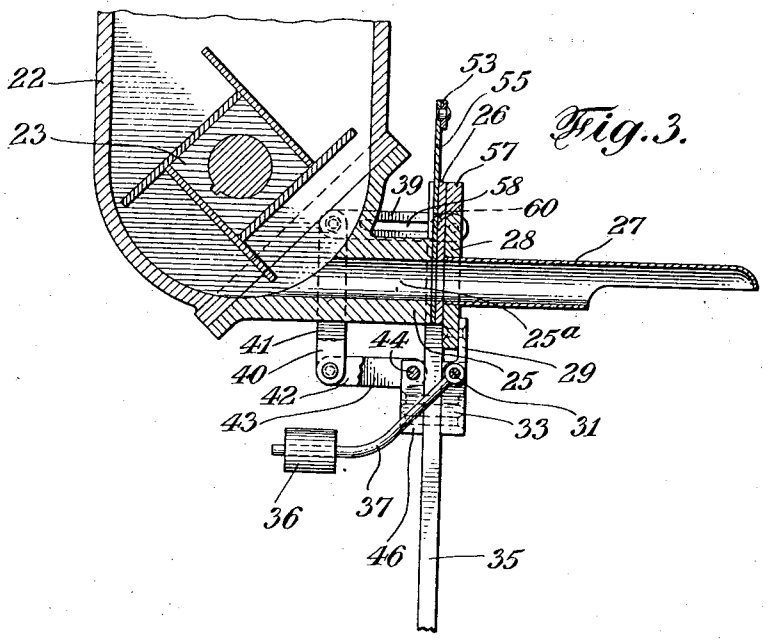


Fig. 3.

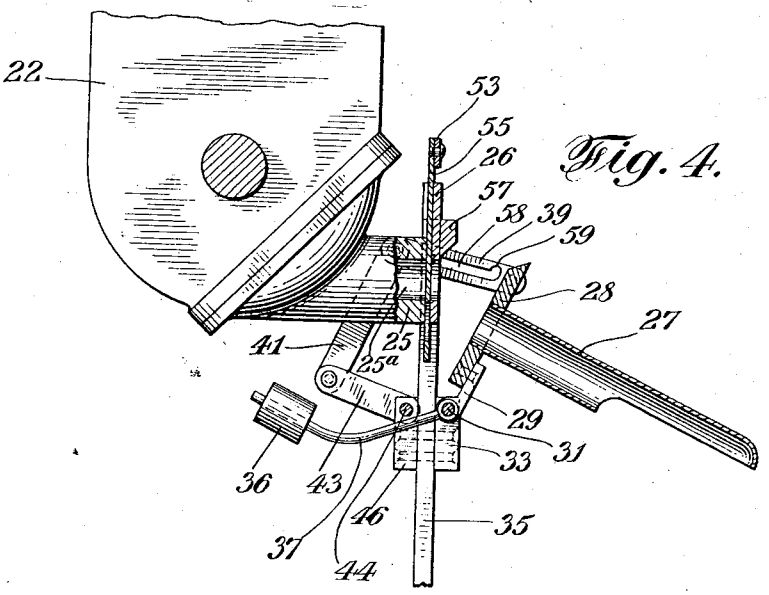


Fig. 4.

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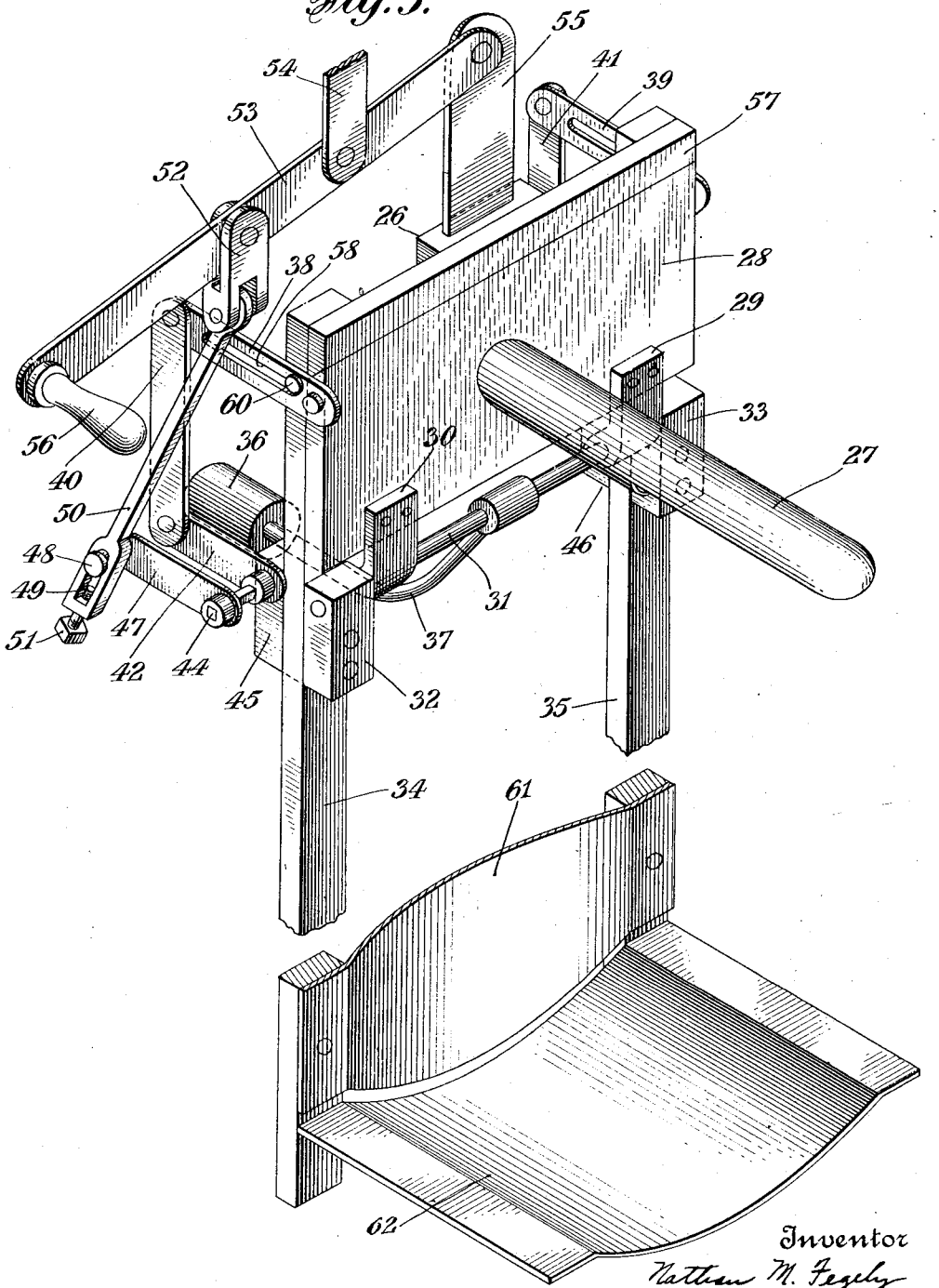
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BAG FILLING MACHINE

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Fig. 5.



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UNITED STATES PATENT OFFICE.

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BAG-FILLING MACHINE.

Application filed May 15, 1925. Serial No. 30,454.

This invention relates to valve bag filling machines and more particularly to machines which are adapted to feed a predetermined weight of material into bags to be filled.

An object of the invention is to provide a machine which will readily discharge the filled bags.

The invention consists in the novel features, arrangements, and combination of parts embodied, by way of example, in the apparatus hereinafter described, as illustrating a preferred form of the invention, and the invention may be more particularly pointed out in the appended claims.

Further objects and advantages of the invention will further appear from the following description taken in connection with the accompanying drawings which show, by way of example, a preferred embodiment of the invention.

Referring to the drawings, in which the same reference characters indicate the same parts in the various views:

Fig. 1 is a front elevation of the machine with certain parts broken away.

Fig. 2 is a side elevation of the machine with certain parts broken away.

Fig. 3 is a detailed view, partly in section, showing the discharge throat and filling spout together with associated parts.

Fig. 4 is a similar view showing the discharge spout in a different position.

Fig. 5 is a perspective view showing the filling spout, closure means, and various associated parts.

A brief description will first be given setting forth some of the more important features in a general way. A feed hopper for holding the filling material is supported on a suitable frame and associated therewith is an agitating means and a centrifugal impeller for forcefully feeding the filling material through a discharge throat adjacent the bottom of the feed hopper. A bag filling spout is pivotally mounted on an upright member carried by the weight receiving end of a weighing scale which is suitably mounted adjacent the base of the supporting structure. This filling spout also acts as a means for supporting the bag to be filled and is normally in register with an opening provided in the discharge throat. The filling spout, together with the members supporting it from the scale, is movable vertically with respect to the discharge throat and when so moved is adapted to pass out of register with the throat opening, thereby shutting off the flow of filling material. An auxiliary closure means is mounted adjacent the discharge throat and is connected by suitable mechanism to the pivoted filling spout in such a manner that upon operating this auxiliary closure means the spout is swung about its pivoted point in a downward vertical direction, so that the filled bag is allowed to slide from the spout. The pivoted spout is provided with a counter-balance adapted to return the spout to its normal position, where it is locked ready to receive an empty bag to be filled. The auxiliary closure means may be now operated to place the discharge throat and filling spout in communication, and to simultaneously lock the spout in horizontal position.

Referring to the drawings, the framework comprises the base members 1, 2, 3 and 4 to which are attached the uprights 5, 6, 7, 8, 9 and 10. Suitable diagonal brace members 11, 12, 13, 14, 15 and 16 are provided for stiffening the frame. A feed hopper 17 is mounted on the cross pieces 18 and 19 attached respectively to the uprights 5—6 and 7—8. An agitating paddle 20, supported in suitable bearings, is positioned within the hopper 17 and is rotated by suitable motive means (not shown) attached to the sprocket 21. A sump 22 is provided at the bottom of the hopper 17 and a centrifugal impeller 23 (Fig. 3) is mounted in the sump and is adapted to be rotated by suitable motive means (not shown) applied to the pulley 24 (Fig. 1).

Referring to Figs. 3 and 4, a forwardly projecting discharge throat 25 provided with an opening 25ª is attached to the sump 22 and the opening is in communication with the sump and feed hopper. The front end of the throat 25 is provided with a vertically extending portion 26 provided with a suitable guideway to accommodate a closure means to be described following.

A bag support, in the present embodiment in the form of a filling spout 27 is rigidly attached to a closure plate 28 in sliding engagement with the front face of the discharge throat portion 26 and is provided with hinges 29 and 30 (Fig. 5) mounted on a hinge pin 31 pivotally supported at its

respective ends by blocks 32 and 33 rigidly attached to scale uprights 34—35. A counter-balance 36 is mounted on a rearwardly extending arm 37 which is rigidly attached to the hinge pin 31 intermediate its ends. Links 38 and 39 are pivotally attached at their front ends to the respective sides of the closure plate 28 and their rear ends are pivoted respectively to the vertical links 40 and 41. The lower ends of the links 40 and 41 are pivoted respectively to the rear ends of the cranks 42 and 43. The front ends of cranks 42 and 43 are rigidly connected to the torque rod 44 which is supported free to rotate in the bearings 45 and 46. A crank arm 47 is rigidly attached to the end of the torque rod 44 projecting beyond the crank 42 and carries at its rear end a crank pin 48 which engages a slot 49 formed in the end of a connecting rod 50—the length of the slot 49 being adjustable by means of the set screw 51. The upper end of the connecting rod 50 is pivotally connected to a link 52, pivoted to a lever 53, pivotally attached to a supporting link 54, which is attached to the cross member 18. The end of the lever arm 53 projects beyond the support 54 and is pivotally attached to a vertically slidable closure means 55, movable in the guideway formed in the portion 26 of the throat 25 and is provided with an opening adapted to be moved into register with the opening 25^a and the bore of the discharge support spout 27. A handle 56 is attached to the other end of the lever arm 52.

A cross piece 57 (Fig. 5) is rigidly attached at its respective ends to the top of the scale uprights 34—35 and its bottom edge is bevelled downwardly and rearwardly and is adapted to serve as a seat for a similarly bevelled face formed in the upper edge of the closure plate 28. The rear face of the cross member 57 forms a continuation of the rear face of the closure plate 28 and is in sliding engagement with the face of the throat portion 26. The link 38 is provided with a longitudinal slot 58 (Fig. 4) terminating at its forward end in an upwardly extending recess 59, and a stop pin 60 (Fig. 5) is mounted adjacent the upper end of the scale upright 34, and is slidably mounted in the slot 58 and adapted to be seated in the recess 59.

The scale uprights 34—35 (Figs. 1 and 2) extend downwardly from the support spout 27 and support a vertical shield 61 and a cradle 62 for supporting a valve bag to be filled. Downwardly extending bearing portions 63—64 are attached to the lower ends of the uprights 34—35 and are supported respectively on the knife edges 65—66 carried by the balance beam 67 which is supported on the fulcrum 68 carried by the cross piece 69 which is suitably supported by the frame structure of the machine. The rear end of the beam 67 carries a balance weight 70, which is suitably supported by knife edges in the usual manner. An auxiliary riderweight 71 is provided and is carried on the beam 67 and adapted to be slidably moved with respect thereto. A vertical strut 72 is rigidly attached to the lower end of the cradle 62 and uprights 34—35, extending downwardly therefrom; and a similar strut 73 is similarly attached to the weight 70. Tie rods 74 and 75 are each pivotally attached at their opposite ends to the struts 72 and 73 respectively and at their adjacent ends are pivotally attached to the pin 76. The beam 67, struts 72 and 73, tie rods 74 and 75 together with their associated parts form a parallel link mechanism which restricts the cradle 62 and associated parts to a vertical movement. A link 77 (Fig. 2) is pivotally attached at its forward end to uprights 34—35 and at its rear end is pivotally attached to the supporting structure of the machine and serves to hold the plate 28 in intimate contact with the forward face of the discharge throat.

While a machine comprising only one unit has been shown by way of describing this invention, it will be obvious to those skilled in the art that the invention is equally adapted to machines comprising a plurality of units as is usual in this type of machine.

Operation.

Referring to Fig. 5: at the beginning of the cycle of operation now to be described, closure means 55 is in its downward position thereby serving to close the opening in the discharge throat 25. An empty valve bag is placed in position on the supporting spout 27 (see also Figs 1 and 2) with the spout extending into the valve thereof. The motive means is now put in operation to rotate the agitating impeller and the centrifugal impeller. The handle 56 is pulled down, as shown in Figs. 1, 2 and 5, thereby raising the auxiliary closure means 55 and hence placing the throat opening 25^a in communication with the discharge spout 27. This movement of the handle 55 also moves the connecting rod 50 downwardly and the upper portion of the slot 49 engaging the crank pin 48 rotates the crank arm 47 downwardly together with the torque rod 44 and the crank arm 42, which in turn pulls the link 40 and its attached link 38 downwardly thereby seating the stop pin 60 in the recess 59. This locks the closure plate 28 in the position shown in Figs. 3 and 5.

The filling material is now being forcefully fed from the hopper 17 out through the throat opening 25^a and spout 27 into the valve bag at this time being filled. As soon as the material in the bag has reached

the desired predetermined weight, which is sufficient to overcome the balance weight 70 of the weighing scale, the forward end of the scale beam tips downwardly carrying with it the uprights 34—35 and their connected parts. This moves the closure plate 28 vertically downwardly to thereby close the discharge throat opening 25a. The slot in the lower end of the connecting rod 50 allows a limited movement sufficient to accommodate the vertical movement of the pin 48 which necessarily moves downwardly with the closure means 28. The bag is now ready to be discharged from the machine. The handle 56 is now pushed up, which moves the auxiliary closure means 55 downwardly to thereby close the discharge throat opening 25a. This operation also raises the connecting rod 50 bringing the set screw 51 into engagement with the crank pin 48 which raises the crank arm 47 thereby raising the crank arm 42, the link 40 and link 38 to thereby release the pin 60 from its cooperating recess 59 thereby allowing the closure plate 28 and the attached spout 27 on which the bag is supported to swing downwardly about the hinge pin 31. This pivotal movement of the spout 27 allows the filled bag to slide from the spout 27, thereby discharging the filled bag from the machine. The counter-balance 36 returns the closure plate 28 and spout 27 to their normal positions; and at this time, the scale beam, supporting cradle, and associated parts return to their normal positions. This completes one cycle of operation and the machine is now ready to operate as hereinbefore described.

Having thus described my invention with particularity with reference to the preferred embodiment of the same, and having referred to some of the possible modifications thereof, it will be obvious to those skilled in the art after understanding my invention, that other changes and modifications may be made therein without departing from the spirit and scope of my invention, and I aim in the appended claims to cover such changes and modifications as are within the scope of the invention.

What I claim is:

1. In a valve bag filling machine the combination of a discharge throat having a discharge opening, a substantially horizontal pivotally mounted valve bag supporting means for supporting the valve of a valve bag normally in register with said opening and movable vertically relative thereto and adapted to be tipped downwardly about its pivot, closure means for said throat opening movable with said supporting means to thereby close said opening, locking means for holding said bag supporting means in a substantially horizontal position and means to release said locking means.

2. In a valve bag filling machine the combination of a discharge throat having a discharge opening, a member movable vertically with respect thereto, a bag filling spout normally in register with said opening and connected to and movable with said vertically movable member and pivotally movable vertically with respect thereto, closure means also movable with said vertically movable member and adapted to close said throat opening, means to hold said spout in its normal substantially horizontal position, and means to release said spout to thereby permit it to be tipped downwardly.

3. In a valve bag filling machine the combination of a discharge throat having a discharge opening, a member movable vertically with respect thereto, a bag filling spout and a first closure means connected to and movable with said vertically movable member and pivotally movable vertically with respect thereto, said closure means being adapted to close said throat opening, means to normally hold said spout and closure means in a substantially horizontal position, a second closure means adapted to also close said throat opening, and means to move said second closure means into position to close the said throat opening and to release said spout and first closure means to thereby permit said spout to be tipped downwardly.

4. In a valve bag filling machine the combination of a discharge throat provided with an opening, a normally substantially horizontal pivotally mounted bag supporting means adjacent said throat movable vertically with respect thereto adapted to hold a valve bag being filled in proper filling position and to be tipped downwardly, closure means for said throat opening adapted to be operated by the vertical movement of said support, means to hold said support in its normal substantially horizontal position, and means operated simultaneously with said vertically movable support to release said support to thereby permit it to be tipped downwardly when the bag has received a predetermined weight of material.

In testimony whereof I have signed my name to this specification.

NATHAN M. FEGELY.