W. A. JOPLIN.

BAG FILLING MACHINE.

APPLICATION FILED FEB. 7, 1912.

1,037,015.

Patented Aug. 27, 1912.

4 SHEETS—SHEET 1.

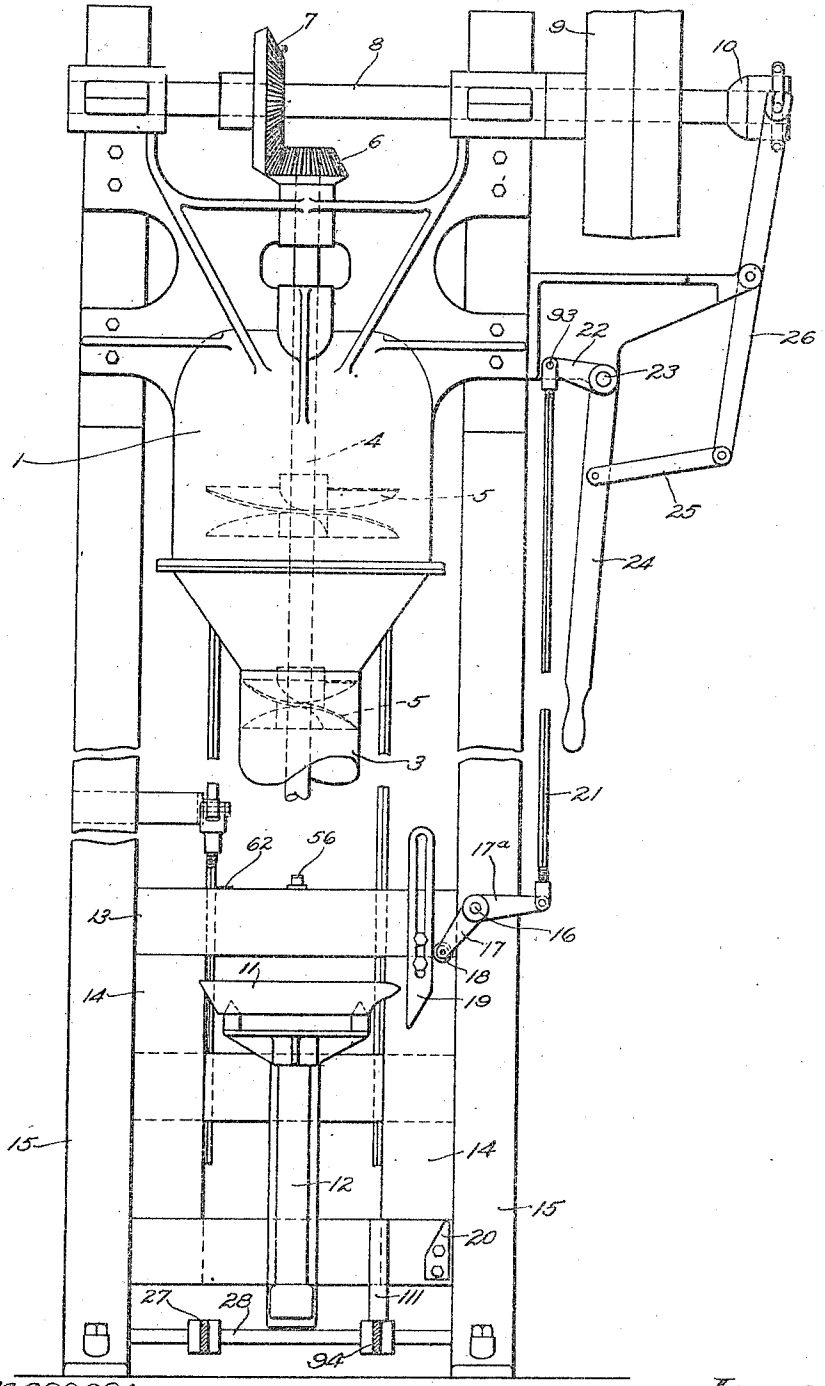

Fig. 1.

Witnesses:
R. Wallace,
John H. Parker.

Inventor:
William A. Joplin
by Macleod, Calver, Copeland & Sibley
Attorneys.

W. A. JOPLIN.

BAG FILLING MACHINE.

APPLICATION FILED FEB. 7, 1912.

1,037,015.

Patented Aug. 27, 1912.

4 SHEETS—SHEET 2.

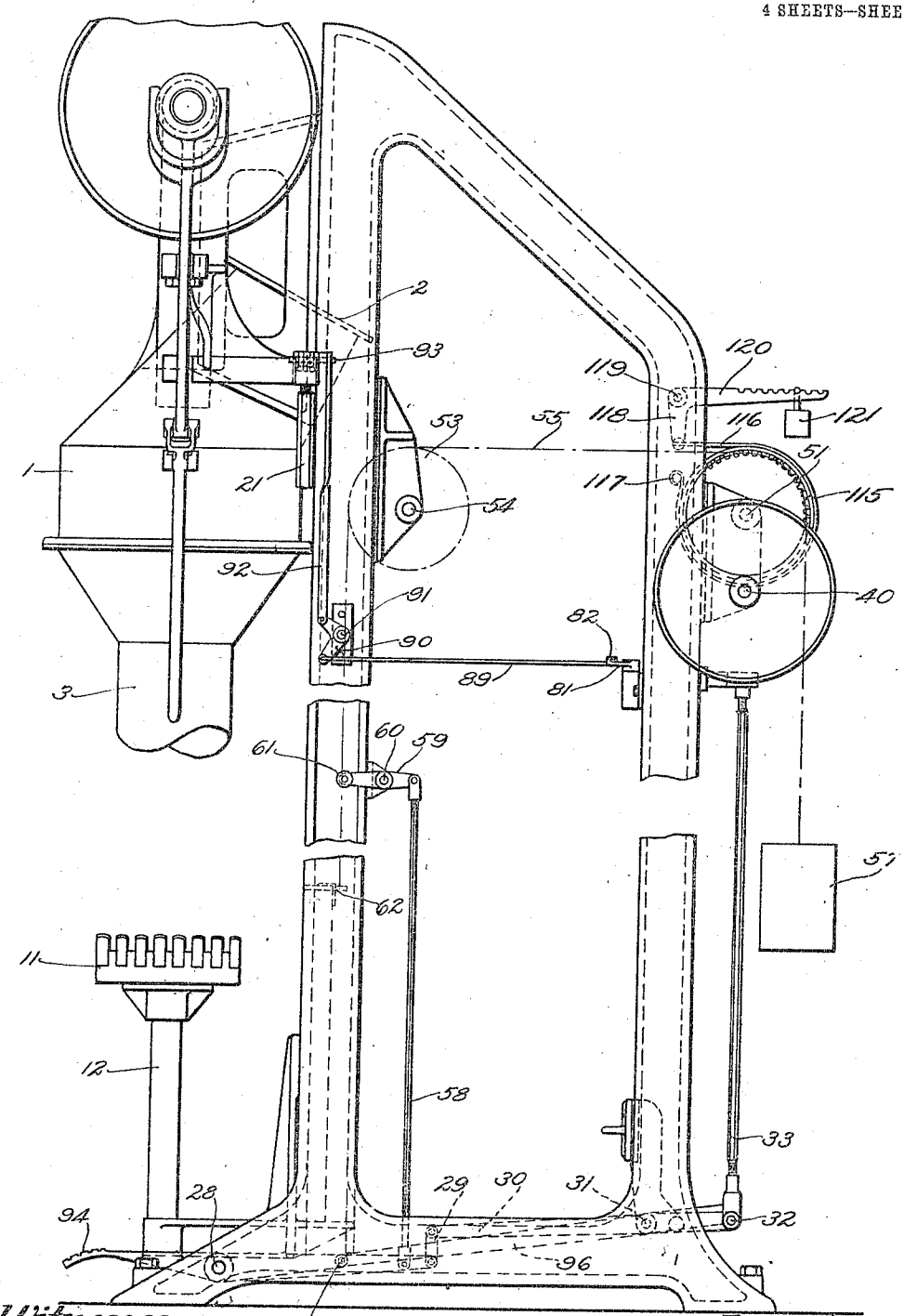

Fig. 2.

Witnesses:
R. Wallace,
John H. Parker.

Inventor:
William A. Joplin.
by Macleod, Calver, Copeland & Sidney
attorneys

W. A. JOPLIN.

BAG FILLING MACHINE.

APPLICATION FILED FEB. 7, 1912.

1,037,015.

Patented Aug. 27, 1912.

4 SHEETS—SHEET 3.

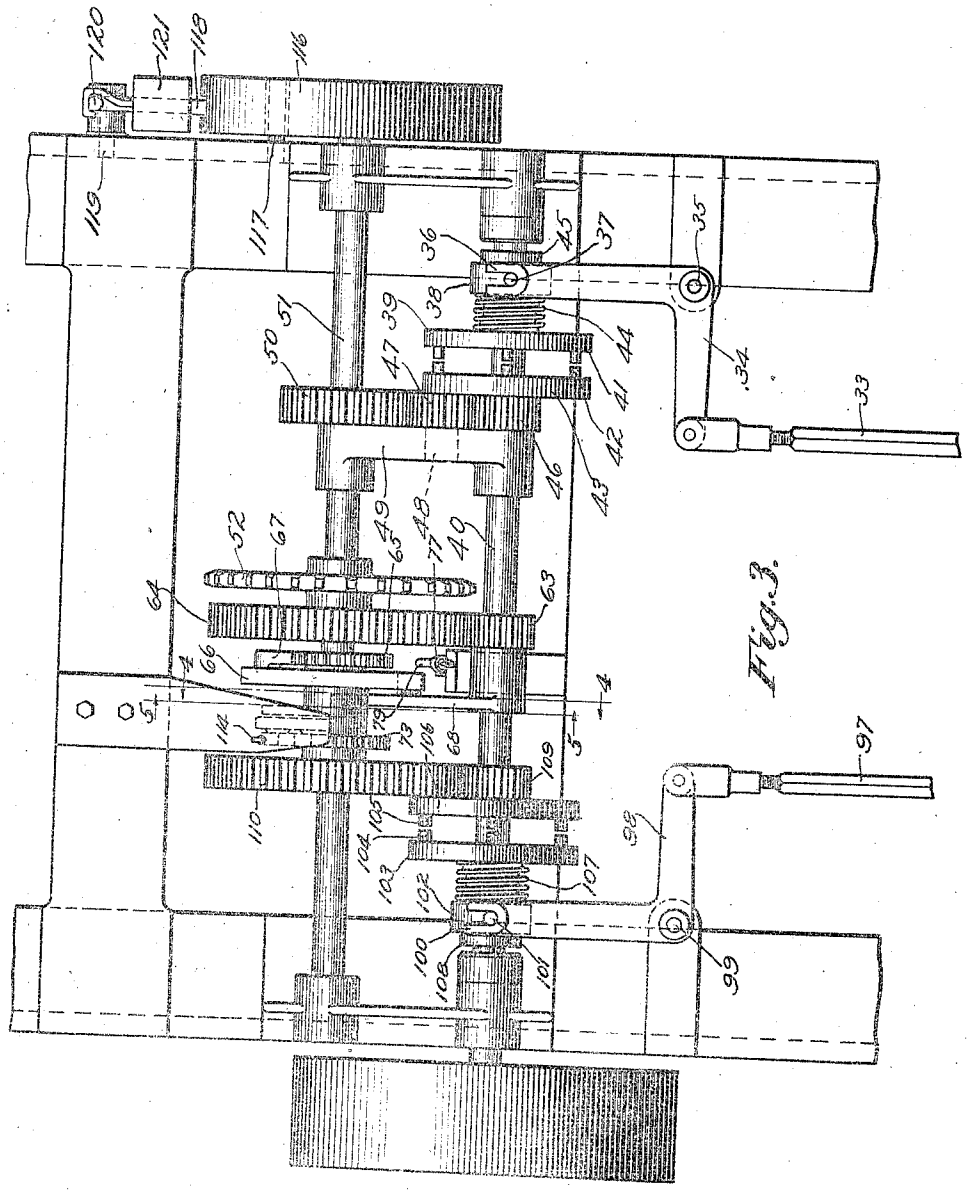

Fig. 3.

Witnesses:
R. Wallace,
John H. Parker.

Inventor:
William A. Joplin
by Macleod, Calver, Copeland & Dike
Attorneys.

W. A. JOPLIN.

BAG FILLING MACHINE.

APPLICATION FILED FEB. 7, 1912.

1,037,015.

Patented Aug. 27, 1912.

4 SHEETS—SHEET 4.

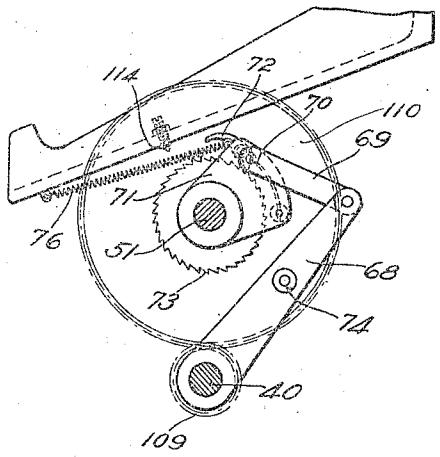

Fig. 4.

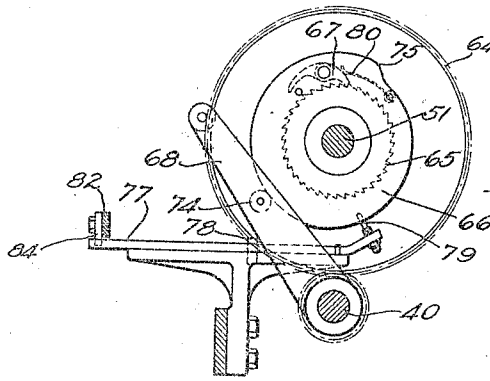

Fig. 5.

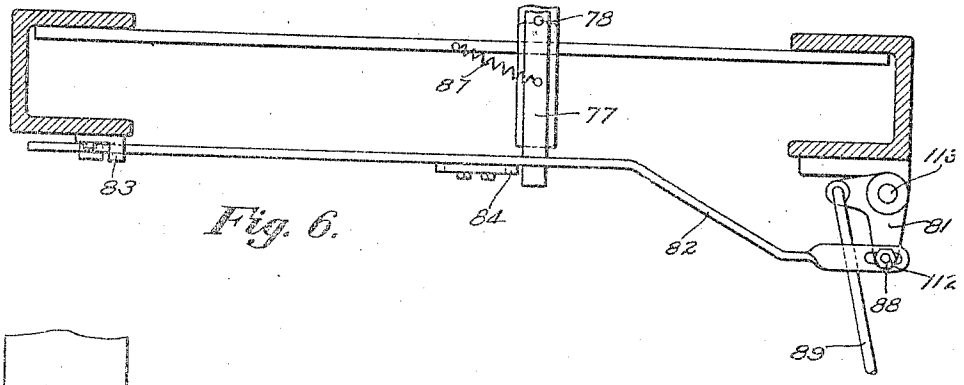

Fig. 6.

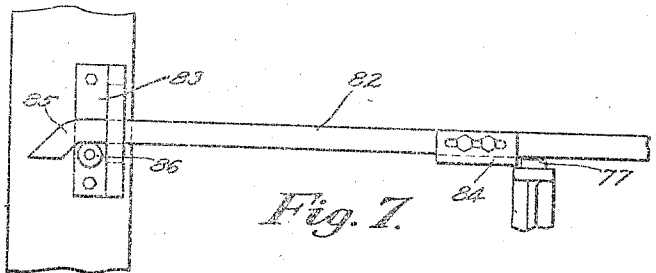

Fig. 7.

Witnesses:
R. Wallace.
John H. Parker

Inventor:
William A. Joplin
by Macleod, Calvert, Copeland & Dike
Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM A. JOPLIN, OF LAWRENCE, MASSACHUSETTS, ASSIGNOR TO PNEUMATIC SCALE CORPORATION LIMITED, OF QUINCY, MASSACHUSETTS, A CORPORATION OF MAINE.

BAG-FILLING MACHINE.

1,037,015 Specification of Letters Patent. Patented Aug. 27, 1912.

Application filed February 7, 1912. Serial No. 676,050.

To all whom it may concern:

Be it known that I, WILLIAM A. JOPLIN, citizen of the United States, residing at Lawrence, in the county of Essex, State of Massachusetts, have invented a certain new and useful Improvement in Bag-Filling Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates especially to that class of bag filling machines in which a worm feed is employed to feed and pack the material into the bag.

In some machines of this character which have been heretofore used the bag is mounted on a vertically reciprocable support which is sometimes termed an elevator, and the mouth of the bag is telescoped onto a cylindrical funnel through which the worm feed extends down into the bag. As the bag gradually fills the elevator or movable support on which the bag stands is correspondingly depressed while the worm is turning and feeding the material into the bag, and after a sufficient quantity has been put into the bag the movement of the worm is stopped. It is necessary to cause still further descent of the elevator until the upwardly extending portion of the bag which still surrounds the funnel is brought below the funnel. Heretofore it has been customary to have the full downward movement continuous. At the time the worm stops there is a column of material within the funnel held by the worm which is in continuation of the material in the bag. When the bag continues its downward movement after the worm stops this column is broken. As speed of operation is important in machines of this character it has been usual to cause this descent of the elevator to be made rapidly and in so doing there is a partial vacuum formed within the bag when the column breaks. This creates a suction which when the top of the bag runs clear of the funnel has a tendency to loosen the material in the top of the bag, destroying its compactness and causing it to fill the bag to a greater height than it should; the suction also causes the material which is held by the worm and funnel to break away at varying points and the material held by the worm will drop at the first jar caused by the removal of the bag.

The object of the present invention is to overcome this tendency and to this end means are provided whereby the break of the column is occasioned by a slow short descent of the elevator or bag support after the worm feed stops whereby the column is broken without the shock occasioned by a sharp long descent and then at the will of the operator there is a quick descent of the elevator which carries it to its lowermost position. It is found by experience that by this method when the top of the bag runs clear of the funnel there is practically no dust discharged or loss of material.

The invention will be fully understood from the following description taken in connection with the accompanying drawings, and the novel features will be pointed out and clearly defined in the claims at the close of the specification.

In the drawings,—Figure 1 is a front elevation partly broken away of a machine embodying the invention. Fig. 2 is a side elevation partly broken away of the machine shown in Fig. 1. Fig. 3 is a rear elevation of a part of the machine shown in Fig. 1 showing the driving mechanism for the elevator. Fig. 4 is a section on line 4—4 of Fig. 3 looking toward the left as shown by the arrows. Fig. 5 is a section on line 5—5 of Fig. 3 looking toward the right as shown by the arrows. Fig. 6 is a horizontal section enlarged and broken away showing the tripping mechanism for allowing the descent of the elevator after the worm stops to cause the break of the column. Fig. 7 is a front elevation partly broken away of the trip actuating mechanism shown in Fig. 6.

Referring now to the drawings: 1 represents the hopper of the machine having an inclined entrance portion 2 to which may be fitted an inclined chute, not shown, for supplying material to the hopper. The lower end of the hopper connects with a funnel 3 of cylindrical form which is adapted to enter the mouth of the bag to be filled. A worm shaft 4 extends down through the hopper and centrally through the funnel 3, being provided with a series of worms 5 to feed and pack the material. Suitable mechanism is provided whereby the worm shaft may be intermittently rotated.

Mounted on top of the worm shaft is a beveled gear 6 which engages with a beveled gear 7 mounted on shaft 8, both of

said shafts being mounted in suitable bearings in the frame of the machine. Mounted loosely on the shaft 8 is a clutch pulley 9 which revolves continuously, the driving mechanism therefor not being shown. A clutch spool 10 is slidably mounted on said shaft 8 and when moved into engagement with the clutch pulley 9 the pulley is thereby made fast to the shaft 8 in well known manner so that the shaft 8 is caused to revolve and thereby the worm shaft 4 and worms 5 are caused to revolve.

The elevator or bag support consists of a platform 11 mounted on a standard 12 which is rigidly connected with a frame work comprising cross bars 13 and upright rails 14, said members 11, 12, 13 and 14 all together comprising the elevator and having a vertically reciprocable movement. The side rails 14 engaging in ways in the sides 15, 15, are what might be termed the elevator guides.

The empty bag to be filled is slipped up and telescoped onto the funnel 3 while the elevator is in its downward position and is held there by hand until the elevator rises to its topmost position when the platform 11 will engage the bottom of the bag and hold the bag against falling as the bag and the elevator are depressed by the worm feed in feeding the material into the bag.

A bell crank lever is pivoted at 16 to one of the side guides 15, said bell crank lever having one arm 17 which carries at its end a roll 18 and is adapted to be engaged at different stages of the movement of the elevator by cams 19 and 20 carried by the elevator. The arm 17^a of said bell crank is pivotally connected with one end of a connecting rod 21 the other end of said connecting rod being pivotally connected with an arm 22 fast to shaft 23. A hand lever 24 is also made fast to shaft 23. A link 25 connects said hand lever with a clutch shipper lever 26 which is connected in well known manner with the clutch spool 10 whereby the clutch spool 10 may be actuated by operation of the hand lever 24 to engage and disengage the clutch spool 10 with the clutch pulley 9 to start or stop the operation of the worm feed at the will of the operator. When the elevator ascends from the position shown in Fig. 1 far enough for the cam 20 to engage with the roll 18 carried by the bell crank 17 the connecting rod 21 and other parts previously described leading to the connecting clutch spool will be actuated to engage the clutch spool with the clutch pulley and thereby start the movement of the worm feed. This upward movement of the elevator will carry the cam 19 up above the cam roll 18 and when the worm feed has filled the bag sufficiently to depress the elevator far enough to cause the cam 19 to ride down into engagement with the cam roll 18 the bell crank 17, 17^a will be turned in a direction to cause the unshipping of the clutch spool whereby the worm feed will stop.

The entire upward movement of the elevator is accomplished by the operation of a treadle at the will of the operator. The downward movement of the elevator is accomplished during the first portion of its movement by the worm feed as already described, then a short further descent of the elevator is produced by automatic mechanism which will be described hereinafter, and the final downward stage of movement of the elevator is produced through a second treadle at the will of the operator. The treadle and connecting mechanism for giving the upward movement of the elevator is as follows:—A treadle 27 is pivoted on a rod 28. The rear end of said treadle 27 is pivotally connected with a link 29, said link 29, being connected with one end of a lever 30 pivoted at 31, the other end of said lever being pivoted at 32 to a connecting rod 33. The upper end of the connecting rod 33 is pivotally connected with one arm of a bell crank 34 fulcrumed at 35, the other arm of said bell crank being formed with a double fork 36 which engages with pins 37 projecting from the opposite sides of the collar 38 on the hub of the disk 39. The collar 38 is loose on the hub of the disk 39. The disk 39 and its hub which is fast to the disk 39 is keyed to the shaft 40 in such manner as to rotate with the shaft 40 but is slidable thereon. The disk 39 is provided with a series of pins 41 projecting from one face thereof which are adapted to engage with a series of pins 42 projecting from a face of a disk 43 which is loose on shaft 40. The disk 39 and shaft 40 are continuously rotating. A collar 45 on one end of the hub of the disk 39 limits the movement of the collar 38. If when the clutch is thrown the pins 41 and 42 strike end to end with each other, the spring 44 will yield to allow a sliding movement of the collar 38 toward the disk 39, until the disk 39 has rotated far enough to disengage the ends of the pins 41 from the ends of the pins 42 and then the spring 44 will expand and throw the disk 39 so that the sides of the pins 41 will come into clutch engagement with the pins 42 and thereby rotate the disk 43. A pinion 46 which is carried on the face of the disk 43 and is fast thereto is loose on shaft 40 and engages with an idler pinion 47 which is loose on a pin 48 which projects from a bracket bearing 49. The pinion 47 engages with a pinion 50 which is fast on shaft 51. This shaft 51 has clutch connections with the driving mechanism whereby when one clutch is engaged the shaft rotates in one direction, and when the first clutch is disengaged and the

other clutch is engaged the shaft rotates in the reverse direction. The shaft will be hereinafter referred to as the reversibly rotating shaft. A sprocket 52 is fast on shaft 51 and a sprocket 53 is loosely mounted on a pin 54 projecting from the frame. A sprocket chain 55 runs over said sprockets 52, 53. One end of said chain 55 is connected at 56 with the elevator frame and a counter weight 57 is attached to the other end of said chain, said weight 57 being approximately of the same weight as the weight of the elevator. When the clutch disk 39 is in engagement with the clutch disk 43 so that the disk 43 turns, the chain 55 will be actuated in a direction to raise the elevator. The elevator should rise to just the point necessary to bring the platform 11 into supporting engagement with the empty bag which has already been slipped by hand onto the lower end of the funnel. For this purpose means are provided to trip the clutch disk 39 from the clutch disk 43 at just the right moment and this should be timed to take place just before the worm feed begins to move. This trip mechanism is as follows:—A connecting rod 58 is pivoted at its lower end to the treadle 27 and is pivotally connected at its upper end with one arm of the lever 59 which is pivoted at 60, the other arm of said lever 59 carrying a roll 61 which extends into the path of a steel plate 62 carried on top of the elevator frame. When the elevator rises sufficiently to bring the platform at the right elevation the plate 62 will engage the roll 61 thereby rocking the lever 59 and depressing the rod 58 and pushing the rod 33 upward thereby turning the bell crank 34 in a direction to move the clutch disk 39 out of engagement with the clutch disk 43 and thereby to stop the elevator. The elevator is thereupon free to be depressed under the action of the feed until it is carried down a predetermined distance according to the adjustment for the requisite amount of material to be packed into the bag at which point the clutch spool 10 will be thrown out of engagement with the clutch pulley 9 to stop the worm feed by means of the cam 19 engaging the roll 18 as already described. The elevator will then still further descend a limited distance to break the column of material in the funnel from the column in the bag by means which will now be described.

Mounted fast on shaft 40 is a pinion 63 which engages with a gear 64 loose on shaft 51. Connected with the hub of gear 64 and fast thereto is a ratchet 65. Mounted loose on said shaft 51 also is a cam 66 which serves as a pawl carrier having pivoted to the face thereof a pawl 67 which is adapted to engage with the teeth of the ratchet 65. A lever 68 is mounted at one end loose on shaft 40, the other end of said lever 68 being pivotally connected with a link 69 which is pivoted at 70 to a pawl carrier 71 mounted loose on shaft 51. Said pawl carrier 71 has pivoted thereto a pawl 72 which is adapted to engage with a ratchet 73 mounted fast on shaft 51. The pinion 63 being fast on the driving shaft 40 and the gear 64 meshing therewith loose on shaft 51 are driven continuously and ratchet 65 being fast to the gear 64 is also driven continuously. Now when the pawl 67 on cam 66 is in engagement with the ratchet 65, said pawl 66 will also be driven. Projecting from the side of the lever 68 is a pin carrying a cam roll 74 which rides on the rim of the cam shaped pawl carrier 66. The rim of said cam or pawl carrier 66 is so shaped as to rock the lever 68 and thereby to move the link 69. When this link 69 moves to the right, as viewed in Fig. 4, if the pawl 72 is in engagement with the ratchet 73, the ratchet 73 will be partly rotated thereby giving a partial rotation to shaft 51 which causes a slight descent of the elevator. This descent is caused by the fact that during this partial rotation of shaft 51 a sprocket 52 which is mounted fast thereon, as previously described, turns in a direction to lift the weight 57 and thereby allow the elevator to descend. When the cam roll 74 rides off of the high point 75 of the cam pawl carrier 66 it will allow the lever 68 to be rocked back by the spring 76 through its connection with the link 69 into position to give another forward movement to the ratchet 73 whenever the pawl 72 is reëngaged with the ratchet 73.

Means are provided to trip the pawl 67 at the end of each rotation of the pawl carrier 66 and means are also provided to trip the pawl 72 at the end of the backward stroke of the pawl carrier 71. This tripping means consists of a pin 114. The adjustment is such that the pawl 72 will be thrown out of engagement with the ratchet 73 just before the pawl 67 is thrown out of engagement with the ratchet 65. The means for tripping the pawl 67 are as follows: A lever 77 swings horizontally on a pivot 78 and carries at one end a pin 79 which is adapted to project into the path of the pawl 67 far enough to engage the curved back of the pawl so as to disengage the pawl from the ratchet once during each rotation thereby stopping the rotation of the pawl carrier 66. Said lever 77 may also be turned on its pivot so as to swing the pin 79 out of engagement with the pawl 67 whereby the spring 80 may cause the pawl 67 to again engage with the ratchet 65. A bell crank 81 is pivoted at 113 to the frame. One arm of said bell crank has a pivotal connection with one end of a slide bar 82 whose other end slides in bearings 83 fast to the frame. A plate 84 is secured to one side of the slide

bar 82 and when the slide bar moves in one direction, as for instance to the right as viewed in Fig. 6 it will engage the lever 77 and turn it on its pivot 78 thereby turning it in a direction to disengage the pin 79 from the pawl 67.

The rear end of the slide bar 82 has a bent portion 85 which during the latter portion of the forward movement of the slide bar rides over a roll 86, slightly tilting up the slide bar 82 so that the shoulder of the plate 84 will rise above the lever 77 and ride over it, which allows the spring 87 to pull the lever 77 back to its normal position.

Preferably the connection between the bell crank 81 and the slide rod 82 is adjustable so as to vary the point at which the plate 84 engages with the lever 77 and the point at which the bent arm 85 engages with the roll 86 so as to vary the time at which the slide bar 82 will be tilted upward. This adjustment is secured by forming an elongated slot 112 in the slide bar 82 where the bell crank is connected with the slide bar by a clamping stud 88.

The means for rocking the bell crank 81 are as follows: A connecting rod 89 is pivotally connected at one end with one arm of the bell crank 81. The other end of said rod 89 is pivotally connected with one arm of a bell crank 90 pivoted at 91, the other arm of said bell crank being pivotally connected with one end of a connecting rod 92, the other end of said connecting rod 92 being pivotally connected at 93 with the arm 22. The cam 19 is so located on the elevator that it will engage the cam roll 18 just before the elevator has reached the bottom of its downward movement under the actuation of the worm feed as previously described and rocking the lever 22, which throws the shipper lever 26 to stop the worm feed. This same movement of the lever 22 which throws the worm clutch also lifts the rod 92, thereby turning the bell crank 90 to move the rod 89 to the left as viewed in Fig. 2. This moves the slide rod 82 to the right as viewed in Fig. 6 causing the plate 84 to engage with the lever 77 and moves the pin 79 out of engagement with the pawl 67 thereby allowing the pawl 67 to become engaged with the ratchet 65. This gives rotation to the pawl carrier cam 66 which in turn actuates the lever 68 and causes a partial rotation of the pawl carrier 71 and shaft 51 to lift the weight 57. This allows a short downward movement of the elevator. As soon as the pawl 72 has become tripped from the ratchet 73, in the manner already described, the elevator will come to a standstill and so remain until it is given a further downward movement at the will of the operator by the means which will now be described.

The means for causing the descent of the elevator are as follows: A treadle 94 pivoted on the same rod 28 as that on to which the treadle 27 was pivoted, is pivotally connected at 95 with one end of a lever 96 whose other end is pivotally connected with the rod 97. Said lever 96 is fulcrumed intermediate its ends on a stud which in the machine from which the drawings are made is in alinement with the stud 31, and therefore is not seen in the drawings, but it is not at all essential that the two studs should be in alinement. The upper end of said rod 97 is pivotally connected with one arm of a bell crank 98 which is pivoted at 99, the other arm of said bell crank being formed with a double fork 100 similar to the double fork on the upper arm of the bell crank 34, said fork 100 engaging with pins 101 projecting from opposite sides of the collar 102, said collar 102 being loose on the hub of a clutch disk 103. Said clutch disk 103 is mounted on shaft 40, being keyed thereto in such manner as to rotate with said shaft but being slidable thereon. Said clutch disk provided with pins 104 projecting from its face adapted to engage with pins 105 projecting from the face of a disk 106 which is loose on shaft 40. A spring 107 is provided to cause a yielding engagement of the pins 104 with the pins 105, as previously described, with relation to the spring 44. A stop collar 108 is also provided for a similar purpose as the stop collar 45. A pinion 109 is fast on the disk 106 and loose on shaft 40 and engages with the gear 110 which is fast on shaft 51.

When the forward end of the treadle 94 is depressed it rocks up the rear end, thereby rocking down the rear end of the lever 96 and pulling down the rod 97, thereby rocking the bell crank 98 in a direction to throw the clutch disk 103 into engagement with the clutch disk 106 and thereby cause rotation of the pinion 109 and gear 110 thus rotating the shaft 51 in a clockwise direction as shown in Fig. 4 in the same direction that it was just previously rotated automatically by the ratchet 73 causing the still further descent of the elevator until it reaches its initial position at the bottom of its movement. A projection 111 on the elevator frame will strike the rear arm of the treadle 94 depressing the pivot connection 95 between the treadle 94 and the lever 96 thereby throwing the outer end of the lever 96 upward so as to lift the rod 97 and turn the bell crank 98 in a direction to disengage the clutch disk 103 from the clutch disk 106 and stop the rotation of shaft 51.

Means are provided whereby the resistance to the descent of the elevator and package under the actuation of the worm feed may be varied and thereby vary the compactness of the materal in the package. This is accomplished by means for varying the re-

sistance to the rotation of the shaft 51. The means shown is as follows. Mounted fast on shaft 51 is a pulley 115. A friction band 116 is secured at one end to the frame of the machine as by a pin 117. Said friction band engages the periphery of the pulley 115 and is secured at its other end to an arm 118 of a bell crank lever fulcrumed at 119 to the frame. The other arm 120 of said bell crank lever supports a weight 121 suspended therefrom and is preferably notched so that the weight may be adjusted and held in its adjusted position against slipping. By varying the position of the weight on the arm 120 the friction of the band 116 on the pulley 115 will be varied. As the friction on the pulley is varied, the ease of rotation of the shaft 51 will be varied. When the friction is increased greater pressure is required on the elevator to depress it, and therefore the worm will pack the material more compactly into the package.

What I claim is:—

1. In a bag filling machine, a funnel for the passage of the material to the bag, a worm feed extending into the funnel, means for actuating the worm feed, a reciprocable support for the bag, tension mechanism whereby the bag is held in telescopic relation to the funnel and which yields to downward pressure of the feed overcoming the said tension, means for stopping the worm feed after a limited descent of the bag support, means for causing further descent of the bag support a limited distance after the worm feed stops, thereby breaking the column of material, and means for causing still further descent by another stage of movement after the column of material is broken.

2. In a bag filling machine, a funnel for the passage of the material to the bag, a worm feed extending into the funnel, means for actuating the worm feed, a reciprocable support for the bag, tension mechanism whereby the bag is held in telescopic relation to the funnel and which yields to downward pressure of the feed overcoming the said tension, means for stopping the worm feed after a limited descent of the bag support, means for causing further descent of the bag support a limited distance after the worm feed stops, thereby breaking the column of material, and means for causing still further descent by another stage of movement at an increased speed after the column of material is broken.

3. In a bag filling machine, a funnel for the passage of the material to the bag, a worm feed extending into the funnel, means for actuating the worm feed, a reciprocable support for the bag, tension mechanism whereby the bag is held in telescopic relation to the funnel and which yields to downward pressure of the feed overcoming the said tension, means for stopping the worm feed after a limited descent of the bag support, automatic means for causing further descent of the bag support a limited distance after the worm feed stops, thereby breaking the column of material, means for causing still further descent by another stage of movement and means controlled at the will of the operator to cause still further descent of the bag support by another stage of movement.

4. In a bag filling machine, a funnel for the passage of the material to the bag, a worm feed extending into the funnel, means for actuating the worm feed, a reciprocable support for the bag, tension mechanism whereby the bag is held in telescopic relation to the funnel and which yields to downward pressure of the feed overcoming the said tension, means for stopping the worm feed after a limited descent of the bag support, means controlled by the mechanism which stops the worm feed to cause a further descent of the bag support a limited distance after the worm feed stops, thereby breaking the column of material, and means for causing a still further descent by another stage of movement after the column of material is broken.

5. In a bag filling machine, a funnel for the passage of the material to the bag, a worm feed extending into the funnel, means for actuating the worm feed, a reciprocable support for the bag, tension mechanism whereby the bag is held in telescopic relation to the funnel and which yields to downward pressure of the feed overcoming the said tension, means for stopping the worm feed after a limited descent of the bag support, means controlled by the mechanism which stops the worm feed to cause a further descent of the bag support a limited distance after the worm feed stops, thereby breaking the column of material, and means for causing a still further descent by another stage of movement at a greater speed after the column of material is broken.

6. In a bag filling machine, a funnel for the passage of the material to the bag, a worm feed extending into the funnel, a vertically reciprocable support for the bag, means to raise the said support into position beneath and in close proximity to the lower end of the funnel whereby it is adapted to support the bag telescoped onto the funnel, means to actuate the worm feed, a yielding mount for the bag support whereby the pressure of the worm feed upon the material as it is fed into the bag will cause the bag and the support to descend, means controlled by the descent of said bag support to stop the worm feed, means controlled by the mechanism which stops the worm feed to then cause a slight further descent

of the said bag support and means controlled at the will of the operator to cause said bag support to descend to a still lower position.

7. In a bag filling machine, a funnel for the passage of the material to the bag, a worm feed extending through the funnel, a reciprocable support for the bag, mechanism to raise the said support into position to support the bag beneath and in close proximity to the lower end of the funnel, means to actuate the worm feed, a yielding mount for the bag support whereby the pressure of the worm feed upon the material as it is fed into the bag will cause the bag and the support to descend a predetermined distance, means to stop the worm feed after a limited descent of the bag support, means controlled by the descent of said bag support near the end of that portion of its descent caused by the worm feed to cause a still further descent of said bag support and mechanism controlled at the will of the operator to cause a further descent of the bag support.

8. In a bag filling machine, a funnel for the passage of the material to the bag, a worm feed extending through the funnel, a reciprocable support for the bag, means to raise said support into position beneath and in close proximity to the lower end of the funnel whereby it is adapted to support the bottom of the bag telescoped onto the funnel, means to actuate the worm feed, a yielding mount for the bag support whereby the pressure of the worm feed upon the material as it is fed into the bag will cause the bag and the support to descend to a predetermined distance, means controlled by the descent of said bag support to stop the worm feed, means for automatically causing a short downward movement of the bag support after the worm feed stops and means controlled at the will of the operator to cause the said bag support to move downward a still further distance at a greater rate of speed than the speed caused by said automatic mechanism.

9. In a bag filling machine, a funnel for the passage of the material to the bag, a reciprocable support for the bag beneath the funnel, a worm feed which feeds the material through the funnel into the bag, a reversible rotary shaft, means connecting said shaft with said bag support whereby when the shaft rotates in one direction it will raise the bag support and when it rotates in the reverse direction said bag support is allowed to descend, driving mechanism and mechanisms adapted to separately connect said reversible shaft with said driving mechanism whereby the said reversible shaft may be rotated alternately in opposite directions.

10. In a bag filling machine, a funnel for the passage of the material to the bag, a reciprocable support for the bag beneath the funnel, a worm feed which feeds the material through the funnel into the bag, a reversible rotary shaft, means connecting said shaft with said bag support whereby when the shaft rotates in one direction it will raise the bag support and when it rotates in the reverse direction said bag support is allowed to descend, driving mechanism, mechanism adapted to separately connect said reversible shaft with said driving mechanism whereby the said reversible shaft may be rotated alternately in opposite directions, and means controlled by the descent of the bag support under the actuation of the worm feed to throw into operative connection between the driving mechanism and the reversible shaft the said mechanism which causes the said shaft to rotate in a direction to allow a further downward movement of the bag support after the worm feed stops.

11. In a bag filling machine, a funnel for the passage of the material to the bag, a worm feed extending through the funnel, a reciprocable support for the bag, a reversibly rotating shaft, means connecting the said shaft with said bag support whereby when the said shaft rotates in one direction it will raise the bag support and when the said shaft rotates in the reverse direction said bag support is allowed to move downward, driving mechanism, alternative clutch connections between said driving mechanism and said shaft whereby the shaft is rotated in alternate directions, mechanism whereby when one clutch makes connection between said driving mechanism and said reversible shaft it raises the bag support, and mechanism controlled by the upward movement of the bag support to trip said clutch and thereby stop the rotation of the reversible shaft and the ascent of the bag support.

12. In a bag filling machine, a funnel for the passage of the material to the bag, a worm feed extending through the funnel, a reciprocable support for the bag, a counter balance for the bag support, a reversibly rotating shaft, means connecting said shaft with said bag support whereby when the shaft rotates in one direction it will raise the bag support, means whereby when the said shaft rotates in the reverse direction the said counter balance will be rendered inoperative and the bag support will be allowed to descend, driving mechanism, means whereby said reversible shaft is given connection with said driving mechanism to raise the bag support, means whereby pressure of the worm feed causes initial downward movement of the bag support, and means whereby the initial downward movement of the bag support actuated by the worm makes the reverse connection between the driving

mechanism and said shaft to overcome the counterbalance and allow further descent of the bag support after the worm feed stops.

13. In a bag filling machine, a funnel for the passage of the material to the bag, a worm feed extending through the funnel, a reciprocable support for the bag, a reversibly rotating shaft, means connecting the said shaft with said bag support whereby when the said shaft rotates in one direction it will raise the bag support and when the said shaft rotates in the reverse direction said bag support is allowed to move downward, driving mechanism, alternative clutch connections between said driving mechanism and said shaft whereby the shaft is rotated in alternate directions, mechanism whereby when one clutch makes connection between said driving mechanism and said reversible shaft it raises the bag support, mechanism controlled by the upward movement of the bag support to trip said clutch and thereby stop the rotation of the reversible shaft and the ascent of the bag support, mechanism controlled by the upward movement of the bag support to start the worm feed thereby depressing the bag support a limited distance, and means controlled by the downward movement of the bag support under actuation of the worm feed to trip the worm feed clutch and to also make the reverse driving connection between the reversible shaft and the driving mechanism whereby the bag support is allowed to still further descend.

14. In a bag filling machine, a funnel for the passage of material to a bag, a vertically movable bag support, means for holding the bag support in position to support a bag in telescopic relation to the funnel, means for feeding material through the funnel into the said bag, means for stopping the feed, means controlled by the stopping of the feed to cause the bag support to descend a limited distance and means for causing the said support to descend by another stage of movement.

15. In a bag filling machine, a funnel for the passage of material to a bag, a vertically movable bag support, means for holding the bag support in position to support a bag in telescopic relation to the funnel, means for feeding material through the funnel into the said bag, means for stopping the feed, means controlled by the stopping of the feed to cause the bag support to descend a limited distance and means for causing the said support to descend by another stage of movement at a greater speed than said first stage of descent.

16. In a bag filling machine, a funnel for the passage of material to a bag, a vertically movable bag support, means for holding the bag support in position to support a bag in telescopic relation to the funnel, means for feeding material through the funnel into the said bag, means for stopping the feed, means controlled by the stopping of the feed to cause the bag support to descend a limited distance and means controlled at the will of the operator to cause the said support to descend by another stage of movement.

In testimony whereof I affix my signature, in presence of two witnesses.

WILLIAM A. JOPLIN.

Witnesses:
WILLIAM A. COPELAND,
ALICE H. MORRISON.