L. H. HARTMAN.

AUTOMATIC RECEPTACLE FILLING MACHINE.

APPLICATION FILED OCT. 16, 1919.

1,401,401.

Patented Dec. 27, 1921.

3 SHEETS—SHEET 1.

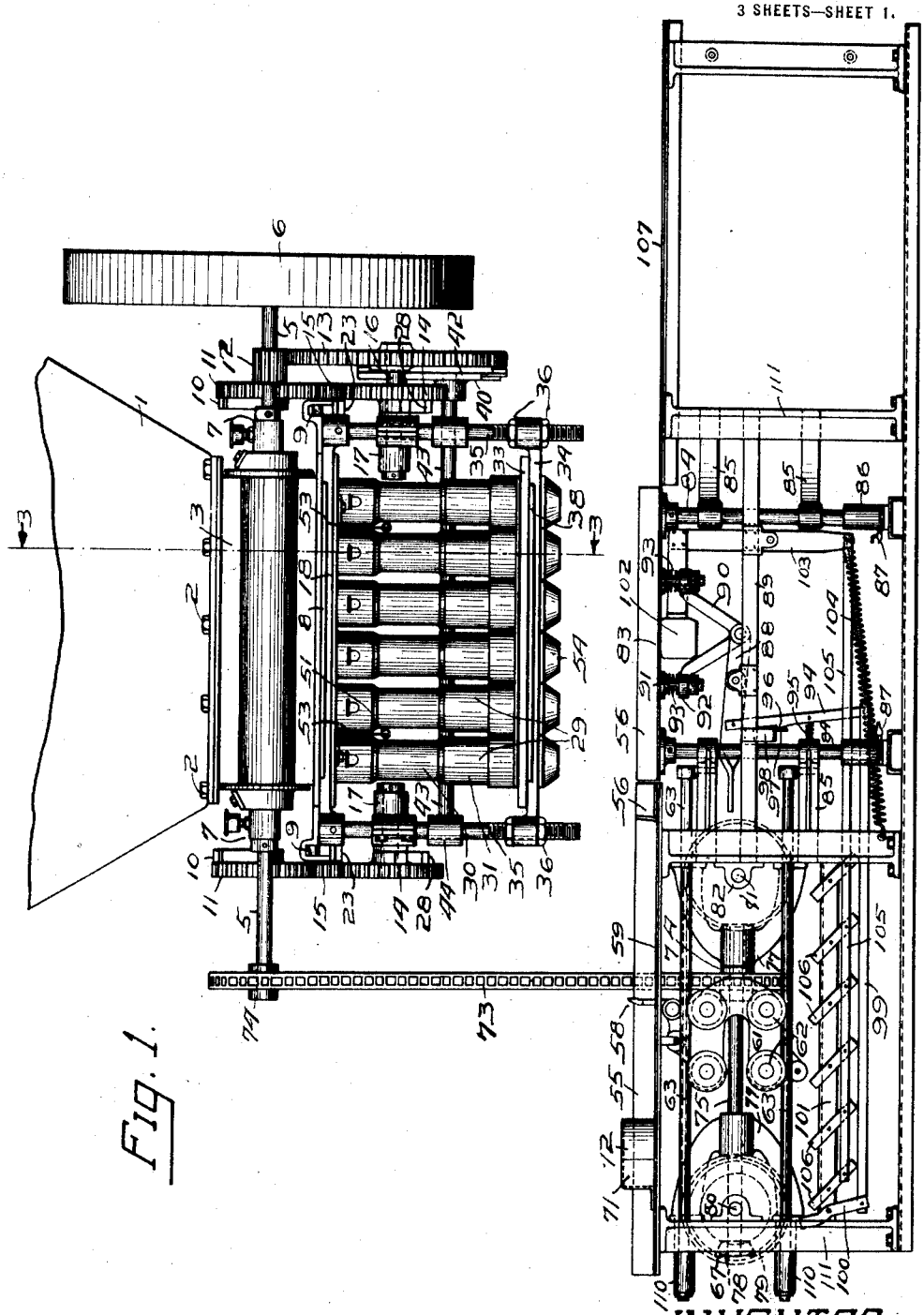


Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 2.

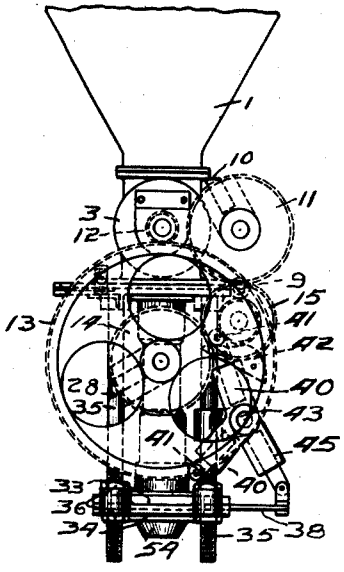


Fig. 3.

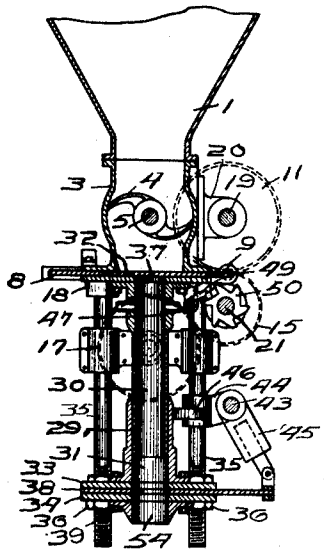


Fig. 5.

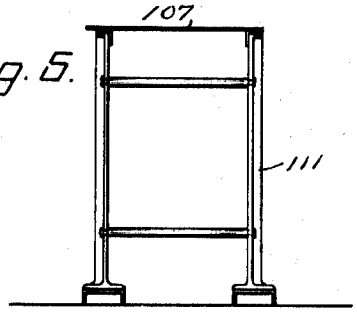


Fig. 4.

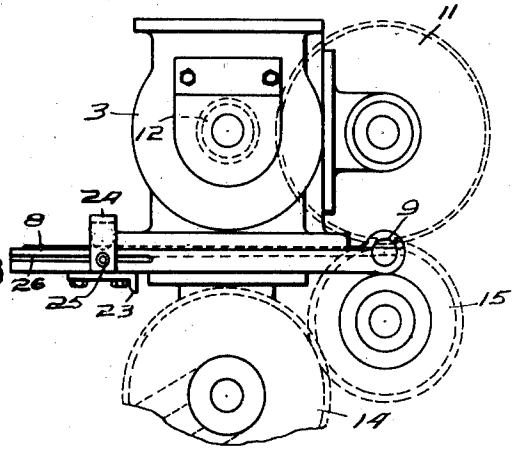
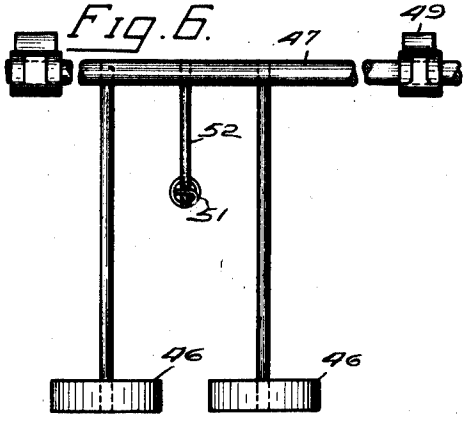


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 7.

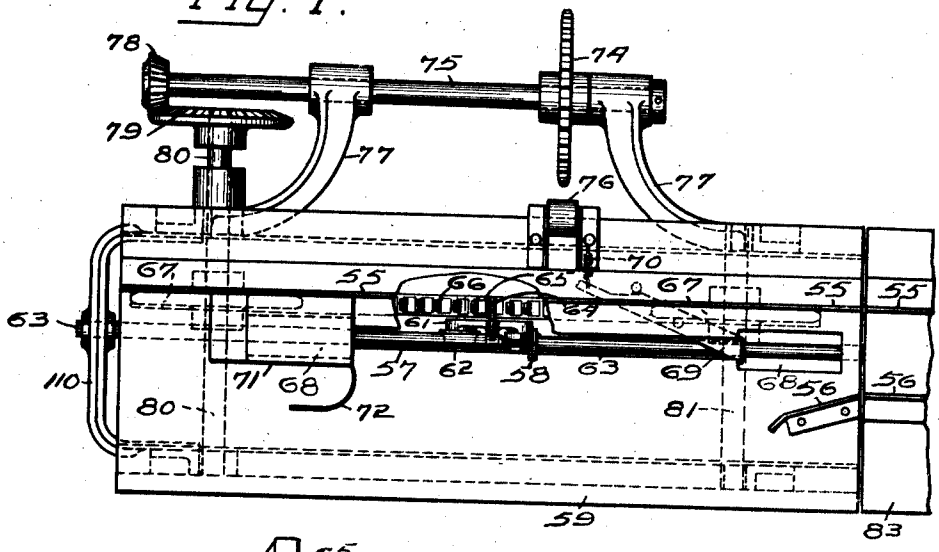


Fig. 8.

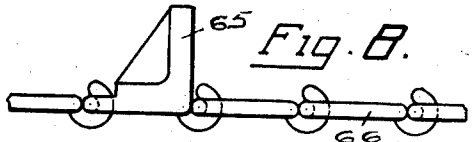


Fig. 10.

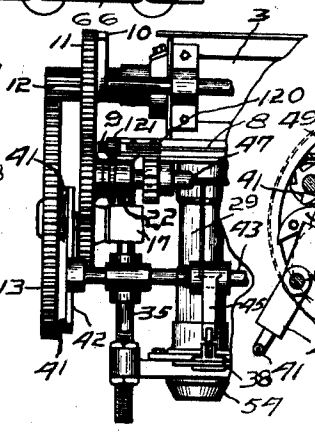


Fig. 11.

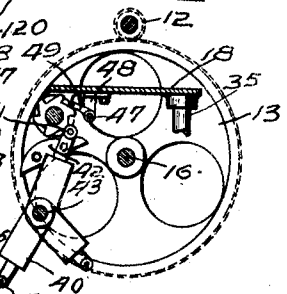


Fig. 9.

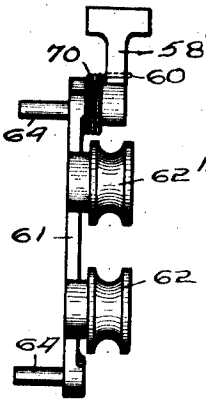
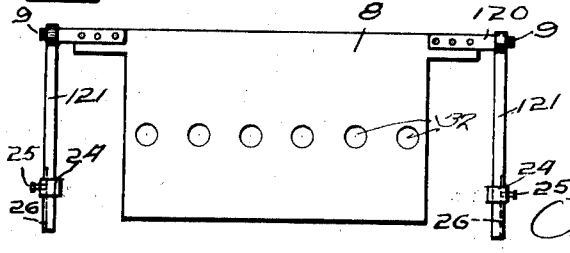


Fig. 12.



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UNITED STATES PATENT OFFICE.

LOUIS H. HARTMAN, OF TOLEDO, OHIO, ASSIGNOR TO THE VALVE BAG COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

AUTOMATIC RECEPTACLE-FILLING MACHINE.

1,401,401. Specification of Letters Patent. Patented Dec. 27, 1921.

Application filed October 16, 1919. Serial No. 331,070.

To all whom it may concern:

Be it known that I, LOUIS H. HARTMAN, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Automatic Receptacle-Filling Machine; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

My invention has for its object to provide a machine for filling cartons or containers with a pulverized or finely divided material, such as lime. It particularly relates to a machine for filling a plurality of paper boxes at the same time. It also has for its object to provide in such a machine a means for accurately controlling the amount of the material that is directed into each of the boxes. It also has for its object to combine in such a machine simplicity of operation and construction with durability and efficiency.

The invention and its parts may be contained in filling machines of different forms. For purposes of illustration and description I have selected one of such machines containing the invention and shall describe it hereinafter. The machine selected is illustrated in the accompanying drawings.

Figure 1 of the drawings is a front view of the machine. Fig. 2 is an end view of part of the machine. Fig. 3 is a sectional view of a part of the machine, taken on the line 3—3 indicated in Fig. 1. Fig. 4 is an enlarged end view of part of the machine, one of the main drive gears being shown removed for purposes of illustration and to more clearly show parts of the mechanism. Fig. 5 is an end view of the delivering table shown in Fig. 1. Fig. 6 illustrates tappers for shaking down the material, also shown in Fig. 3. Fig. 7 is a top view of the receiving table. Fig. 8 illustrates a part of a chain and a dog connected to or forming one of the links of the chain for sequentially operating parts of the mechanism. Fig. 9 illustrates a carriage for manipulating the paper boxes or cartons. Fig. 10 is a rear broken view showing the upper cut-off mechanism and parts connected therewith. Fig. 11 illustrates means for operating the lower cut-off mechanism. Fig. 12 illustrates one of the cut-off plates.

1, Fig. 1, is a hopper which directs the material from a suitable bin to the machine. The hopper is supported by the structure of the ceiling in any suitable way. The means for directing the material to the containers is attached to the lower end of the hopper by means of the bolts 2 and thus the said means is supported in its proper position.

The lower end of the hopper is closed by the casing 3 in which is located a rotatable member 4, shown in Fig. 3, for allowing the material contained in the hopper 1 to pass to tubular members for directing the material to the containers. The rotatable member 4 is connected to the shaft 5 on which is located the drive wheel 6. The shaft 5 is supported in bearings 7 located on opposite ends of the casing 3.

The casing 3 is closed by a plate 8 having knobs 9 located on the ends of the brackets 120 attached to the forward corners of the plate which are operated on by the lugs 10 to shift the plate and open the lower end of the casing 3. The lugs 10 are supported on the gear wheels 11 and thus the knobs 9 are engaged by the lugs 10 during each consecutive rotation of the gear wheels 11. The gear wheels 11 are driven by the wheel 6 through the gear wheels 12, 13, 14 and 15, the gear wheel 12 being located on the shaft 5 and the gear wheel 14 being located on the same shaft on which the gear wheel 13 is located and the gear wheel 15 being an idler between the gear wheels 14 and 11. The shaft 16 on which the gear wheels 13 and 14 are located are supported in the bracket 17 which is attached to depending rods connected to the plate 18 which is bolted to the lower side of the casing 3. The gear wheels 11 are connected together by the shaft 19 which is supported by means of brackets 20 on the casing 3. The opposite end of the machine is provided with a second gear wheel 14 which coöperates to shift the plate 8, as hereinafter described. The second idler gear 15 also interconnects the gears 11 and 14 at the other end of the machine. The idlers 15 are connected together by the shaft 21 which is supported on brackets 22. By this arrangement the gear wheels 11, 14 and 15, located at opposite ends of

the machine, operate together to perform their several functions.

The gear wheels 14 operate to close the casing 3 by operating on the plate 8. A pair of lugs 23 are connected to the plate 8 by any suitable means, such as through the brackets 24 adjustably secured to rods 121 by means of bolts 25 that set into the channel 26. The rods are secured to the brackets 120 and extend rearwardly from the front edge of the plate. The gear wheels 14 are provided with lugs 28 that engage the lugs 23 which are located at the rear corners of the plate 8 to draw the plate 8 back and close the casing 3.

A plurality of telescoping cylinders 29 having the telescoping parts 30 and 31 are located beneath the plate 8. The plate 18, which forms the lower end of the casing 3, is provided with a plurality of openings 37. The parts 30 of the telescoping cylinders 29 are connected to the plate 18 so as to register with the openings 37. The parts 31 of the cylinders are connected to a pair of adjustable plates 33 and 34. The parts 31 are connected to the plate 33, and the plate 33 at its ends is bolted to the plate 34. The plate 34 and consequently the plate 33 and the parts 31 are supported on the depending rods 35 which are connected to the plate 18. The rods are threaded at their lower ends and adjusting nuts 36 are located at opposite sides of ears or bosses that are formed on the plate 34 whereby the parts 31 of the telescoping tubes may be adjusted relative to the parts 30 and thus the volume of the interior of the telescoping tubes 29 may be varied and adjusted according to the amount of the material to be delivered to each of the containers that are placed beneath the telescoping tubes. The plate 8 is provided with openings 32 which, when pulled forward by the operation of the lugs 10 located on the gear wheels 11, will register with the openings 32 and the telescoping cylinders 29. During this period the material passes from the casing 3 into the telescoping tubes 29. When, however, the lugs 28 strike the lugs 23 the plate 8 is drawn rearward so as to close the upper ends of the cylinders 29.

The lower ends of the cylinders are opened and closed by means of a plate 38 which is provided with openings 39 that register with openings formed in the plates 33 and 34 and consequently with the lower ends of the cylinders when the plate 38 is drawn forward. The plate 38 slides between the plates 33 and 34 and is operated by means of a bell crank lever 40 which is provided with rollers 41 that are operated on by a cam bracket 42 located on the gear wheel 13. The cam bracket 42 operates on one of the rollers 41 to pull the plate 38 in one direction and upon the other roller 41 to move the plate in the opposite direction. The lever 40 is connected to the shaft 43 that is supported in brackets 44 located on two of the depending rods 35. The shaft 43 is connected to a pair of arms 45 that are connected to the plate 38. The plate 38 is shifted so as to open the lower ends of the cylinders 29 by the operation of the lower roller 41 whereby the lower roller 41 is moved outward from the axis of the gear wheel 13 by the operation of the cam bracket 42, while the lower ends of the cylinders 29 are closed by the cam bracket 42 operating on the upper roller 41 which pushes the lower ends of the arms 45 toward the cylinders. When the plate 38 closes the lower ends of the cylinders the plate 8 is opened and the cylinders are filled with the material fed through the casing 3. The arms 45 are formed of telescoping parts for purposes of adjustment of their length so as to permit an adjustment of the cylinders 29 and consequently control of the amounts of material fed to the cylinders and at the same time provides for the change in the distance between the pivot points of the arms 45 as the plate 8 is moved back and forth beneath the cylinders.

During the time that the material is being fed to the cylinders, that is, during the filling of the cylinders, the cylinders are tapped by suitable tappers so as to jar the cylinders and shake down the material. This prevents sticking of the material against the side walls of the cylinders. Also during the emptying of the cylinders the tappers shake or jar the cylinders so as to cause the delivery of all of the material that is caught between the plates 8 and 38 and thus cause the complete emptying of the cylinders while the plate 8 is closed. The tappers 46 are supported on a shaft 47 that is supported on brackets 48. Opposite ends of the shaft 47 are provided with fingers 49 that are operated upon by the ratchet wheels 50 which are connected to the gear wheels 15. Rotation of the gear wheels 15 causes the tappers to be raised from the cylinders. Releasement of the fingers 49 permits the springs 51, which are connected through rods 52 to the shaft 47, to pull the tappers 46 against the cylinders 29. The springs 51 are also connected to brackets 53 which are connected to the plate 18. The cylinders 39 are thus jarred during the operation of the machine and thus the material is settled in the cylinders while they are being filled and delivered to the containers when the lower ends of the cylinders are opened.

Mouth pieces 54 that form outlets of the cylinders may be bolted to the plate 34. The outside surfaces of the mouth pieces 54 are conical in form and consequently may be readily inserted in the tops of the containers or in openings contained in the tops of the containers. The outlets of the cylinders are particularly adapted for filling

cartons or paper boxes with lime and the cartons or paper boxes are raised so that the mouth pieces 54 may be inserted in openings in the cartons. The cone-shaped surfaces center the round openings formed in the top of the cartons when the cartons are raised so as to press against the cone surfaces.

The cartons or paper boxes are placed on a table top or a plate located beneath the cylinders. In the form of the invention shown a number of cartons corresponding to the number of the cylinders are shifted beneath the cylinders. The table, which may be formed of one or more parts, is provided with guiding flanges 55 and 56. The containers are placed against one of the flanges 55 by the operator and over the slot 57 formed in a part of the table top. A reciprocating member 58 engages the cartons that are thus placed on the table top 59 and moves along the table top to push the cartons underneath the row of cylinders 29.

The reciprocating member 58 is an upwardly extending T-shaped finger that is spring pressed rearwardly, that is, away from the containers, and against a suitable stop, such as a pin 60. The finger 58 and the pin 60 are supported on a carriage 61. The carriage 61 is provided with four guide rollers 62 which are located between rods 63 that form tracks over which the rollers will run to guide the reciprocatory movements of the carriage 61 and member 58. The carriage 61 is also provided with pins 64 that extend in the path of movement of the dog 65 which is connected to or forms one of the links in a chain 66 that moves over the sprocket wheels 67. The parts of the chain 66 between the sprocket wheels 67 are located in parallel relation and in proximity to the rods 63 over which the rollers 62 run and consequently the dog 65 engages the pins 64 alternately to move the carriage toward and away from the cylinders 29. When the upper pin 64 is engaged by the dog 65 the finger 58 is moved toward the cylinders 29 and while the finger 58 extends above the table top 59. But on the return movement of the carriage 61 the reciprocatory member 58 passes beneath the table top in order to prevent interference with the placing of the cartons, that are to be subsequently pushed beneath the cylinders 29, on the table.

The slot 57 terminates at its ends in enlarged openings 68 which permits movements of the upper end of the finger 58 through the table top. When the finger 58 enters the enlarged opening 68 at the end of the slot 57 near the telescoping tubes the latch 69 is pushed to one side and subsequently, by the operation of the spring 70, closes behind the finger 58. Upon the return movement of the carriage 61 the finger 58 is pushed forward, that is, toward the cylinders 29 and turned downward beneath the table top as the carriage returns. The top of the finger 58 prevents the return of the finger through the slot 57 until the finger reaches the other enlarged opening 68 whereupon the spring 70 raises the finger 58 against the stop 60 and thus places the finger 58 in position to engage the cartons that may be placed against one of the flanges 55 and which are to be pushed forward at the proper time to be filled. A box 71 covers the opening 68 where the finger 58 rises above the table top. This is to prevent interference of the finger 58 with a carton that might otherwise be accidentally placed over the said opening 68. If desired, a guiding flange 72 may be placed in front of the box 71. This permits a large number of boxes to be picked up by the operator and placed on the table top, the machine being timed to shift the boxes while the cylinders 29 are being filled, the return of the carriage 61 being during the time that the boxes are being filled.

The movement of the reciprocatory member 58 that shifts the boxes is timed with the movements of the plates 8 and 38 by the connection that is established between the mechanism supported on the lower end of the hopper and the mechanism supported beneath the table. These mechanisms are connected together by means of the sprocket chain 73 which passes over the sprocket wheels 74, one located on the shaft 5 and the other located on the shaft 75. The sprocket chain 73 also passes over the corner of the table top 59 and contact with the table top is prevented by means of the roller 76 which is secured in suitable brackets to the table top. The shaft 75 is supported in suitable bearings located in brackets 77 secured to the table. A bevel gear 78 is connected to the shaft 75 and operates upon the bevel gear 79 which is connected to the shaft 80. One of the sprocket wheels 67 is also connected to the shaft 80 and thus the sprocket chain 66 is driven through the operation of the sprocket wheels 74. The other sprocket wheel 67 is connected to a shaft 81 which is also supported in bearings 82 located on the table. Thus connection and relation is established between the operations of the mechanism of the table and the mechanism that controls the movement of the material into and out of the cylinders 29.

When the containers or boxes are placed on the table beneath the cylinders 29 they are raised toward the cylinders 29 so as to press the edges of the openings of the boxes against the cone surfaces of the mouth pieces 54 that form the outlets of the cylinders 29. The part 83 of the table top is

connected to legs 84 that slidingly move in brackets 85 that are connected to other parts of the table. The ends of the legs 84 also move in sockets 86 located on the floor. The sockets 86 are provided with pet-cocks 87 that regulate the return or lowering movement of the table top 83. The lower ends of the legs 84 and the sockets 86 cushion the downward movement of the part of the table and prevent any undue jarring by reason of the downward movement of the table. The part 83 of the table is raised by means of the lever 88 which is pivotally supported on a cross-piece 89 secured to the legs for supporting other parts of the table. The end of the lever 88 is connected to a V 90. The arms of the V are removable over depending rods 91 but are yieldably held against stops 92 by means of the springs 93. The table 83 is raised until the cartons strike the surfaces of the mouth pieces 54 and further movement of the lever 88 is taken up by the springs 93, that is, the springs 93 permit further movement of the lever without further movement of the cartons. The lever 88 is operated by the dog 65 as it passes over the sprocket wheel 67 located on the shaft 81. The dog pushes the end of the lever 88 down and raises the table 83 which is connected to the other end of the lever. The table 83 is held in this position while the cartons or boxes are being filled. A rod 94 is pivotally connected to the lever 88 and is moved down when the lever is operated on by the dog. The rod 94 is pulled over by the spring 95 so as to cause a lug 96 formed on the rod 94 to engage with the edge of an L 97 located on a bracket 98 supported on the strip 89. Return movement of the lever 88 is thus prevented and consequently the table top 83 is held up until the rod 94 is released.

The rod 94 is connected to the rod 99 which is in turn connected to a rod 100. The rod 100 is pivoted to a bar 101 which is also secured to the legs of a part of the table. When the rod 94 is moved so as to engage the lug 96 with a part of the frame of the table, the upper end of the rod 100 moves into the path of the dog 65 and toward the other sprocket wheel 67. When therefore the dog 65 strikes the rod 100 the rod 94 disengages itself and the lever 88 is released which permits the table top 83 to lower. This is accomplished, of course, when the boxes have been filled and are ready to be shifted from beneath the cylinders.

During the filling of the boxes, the boxes are shaken or jarred so as to prevent sticking of the material and insure settling of the material in the boxes or containers. In the form of the invention shown the table top on which the containers rest is jarred by means of the rapper 102 which is supported on a bell crank lever 103. The bell crank lever 103 is pivotally connected to the cross-bar 89. A spring 104 is connected to the lever 103 so as to raise the rapper 102 with the upward movement of the table top 83 when the table top is raised by the operation of the lever 88. The spring 104 tends to keep the rapper 102 against the under side of the table top 83. A rod 105 is connected to the end of the lever 103 and a plurality of rods 106 are connected to the rod 105. The rods 106 are pivoted on the bar 101 and the upper ends of the rods 106 are located in the path of movement of the dog 65 so that during the return movement of the dog 65 and while the cartons are being filled the dog will successfully strike the upper ends of the rods 106 and through the rod 105 lower the rapper 102 from the table top 83. When the dog releases each of the rods 106 the spring 104 will pull the rapper 102 against the table top 83 with a quick movement which will jar the table top and consequently jar the cartons located on the table top. This will shake down the material into the containers.

A third part 107 of the table top may also be provided for receiving the filled cartons which will be delivered to the table top 107 when the dog 65 moves a lot of empty containers beneath the cylinders 29.

It will thus be seen that the operation of the dog 65 is to move the carriage 61 so as to push empty containers beneath the cylinders 29 by pressing against the upper pin 64 of the carriage 61 until the dog passes over the sprocket wheel 67 located on the shaft 81. It then strikes the end of the lever 88 to raise the boxes thus shifted beneath the cylinders 29 and then is carried down and strikes in sequence the ends of the rods 106 which causes the rapper 102 to jar the cartons until it strikes the rod 100 which releases the lever 88 and permits the cartons to be lowered from the ends of the cylinders 29. In the meantime it has caused the return of the carriage 61 by pressure against the lower pin 64 and during the return of the carriage the reciprocating member 58 has passed to its initial position but has passed to that position underneath the table top by reason of the operation of the latch 69 which closes the narrow portion of the slot 57. The dog 65 again engages the upper pin 64 of the carriage 61 and carries the reciprocating member 58 forward to shift an additional lot of boxes beneath the cylinder 59 and push those that have been filled onto the third part of the table top 107.

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

1. In an automatic machine for filling containers, a table having a movable top part, means located above the said part for di-

recting the material to the containers, a reciprocatory member for moving the containers along the table, means for operating the reciprocatory member and raising the table top part to raise the containers to the said means for directing the material to the continers, means for causing the reciprocatory member to return below the table top.

2. In an automatic machine for filling containers, means for directing the material to the containers, a plate for supporting the containers, a reciprocatory member for moving the containers beneath the means for directing the material to the containers and extending above the plate, a latch for engaging the reciprocatory member and causing it to pass below the plate on its return movement from the means for directing the material to the containers, a carriage connected to the reciprocatory member, a belt, a dog connected to the belt for engaging the carriage to first move it in one direction and then to return the carriage.

3. In an automatic machine for filling containers, a table having a movable top part, means located above the said part for directing the material to the containers, a reciprocatory member for moving the containers along the table, means for operating the reciprocatory member and raising the table top part to raise the containers to the said means for directing the material to the containers, a tapper for striking the under side of the said part for shaking the material down in the containers, means for operating the said tapper.

4. In an automatic machine for filling containers, a means for directing the material to the containers, a table top part for supporting the containers beneath the means for directing the material to the containers, a means for raising the table top part to raise the containers to the means for directing the material to the containers, a tapper for jarring the containers while being filled, a reciprocatory member for shifting the containers onto the table top part, a reciprocating dog for operating the reciprocatory member and for raising the table top part and for operating the tapper.

5. In an automatic machine for filling containers, a means for directing the material to the containers, a table top part for supporting the containers beneath the means for directing the material to the containers, a means for raising the table top part to raise the containers to the means for directing the material to the containers, a tapper for jarring the containers while being filled, a reciprocatory member for shifting the containers onto the table top part, a dog for operating the reciprocatory member and for raising the table top part and for operating the tapper, a belt connected to the dog for operating the dog.

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

LOUIS H. HARTMAN.