

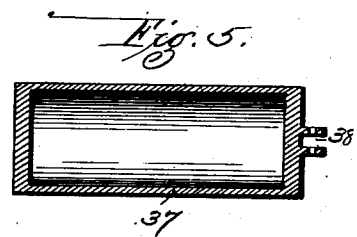
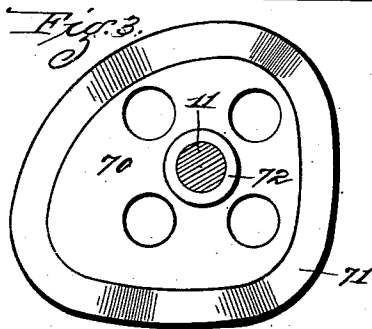
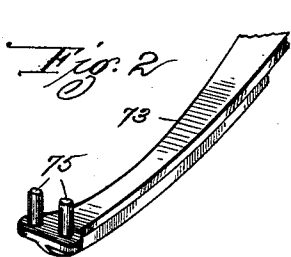
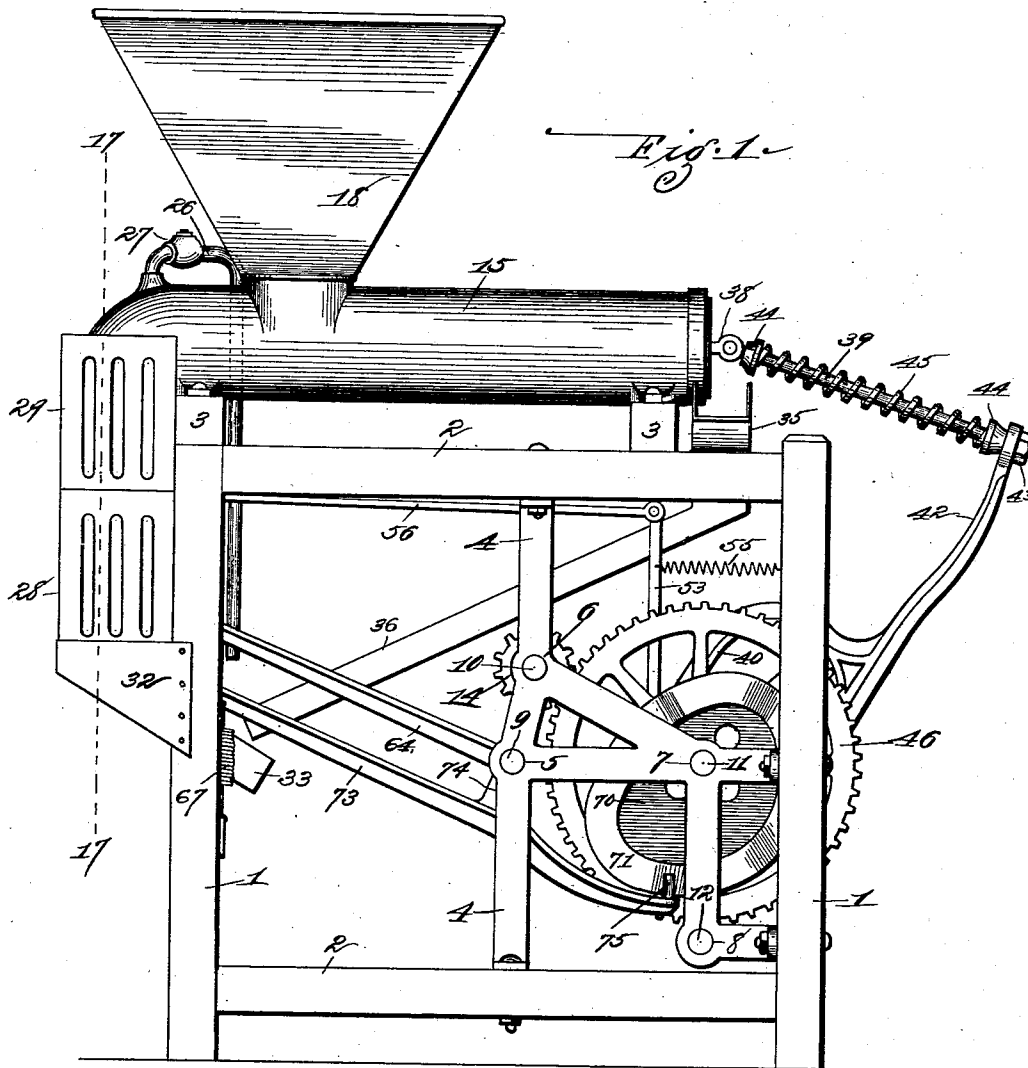
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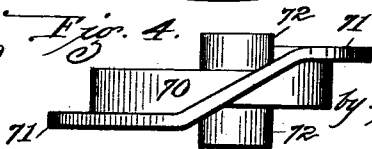
W. S. PLUMMER.
CAN FILLING MACHINE.

No. 569,030.

Patented Oct. 6, 1896.



Attest
M. Smith,
John L. Tunison.



Inventor:—
Wm. S. Plummer:—
by Higdon & Higdon & Tongan
Attys.

(No Model.)

4 Sheets—Sheet 2.

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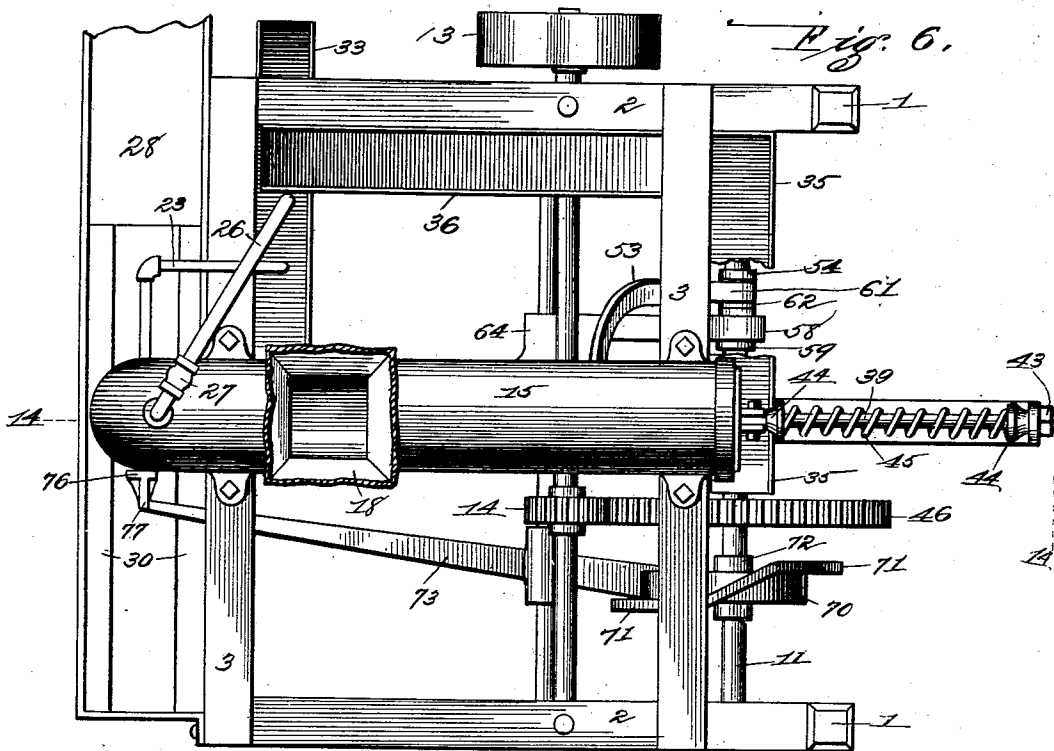


Fig. 7.

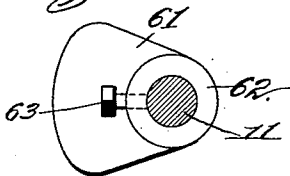


Fig. 8.

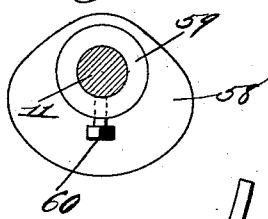


Fig. 9.

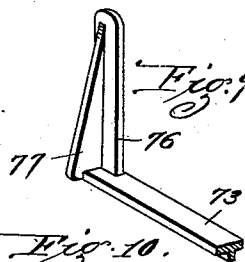


Fig. 10.

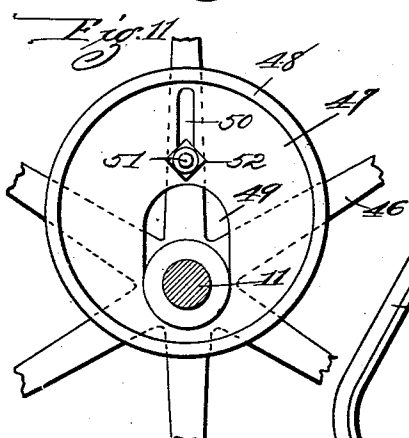


Fig. 11.

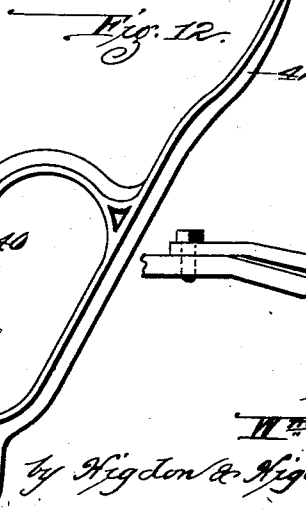


Fig. 12.

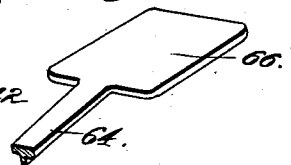
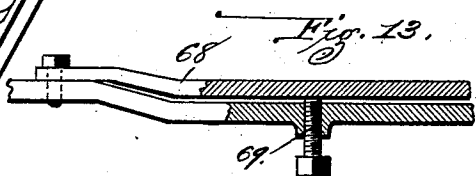


Fig. 13.



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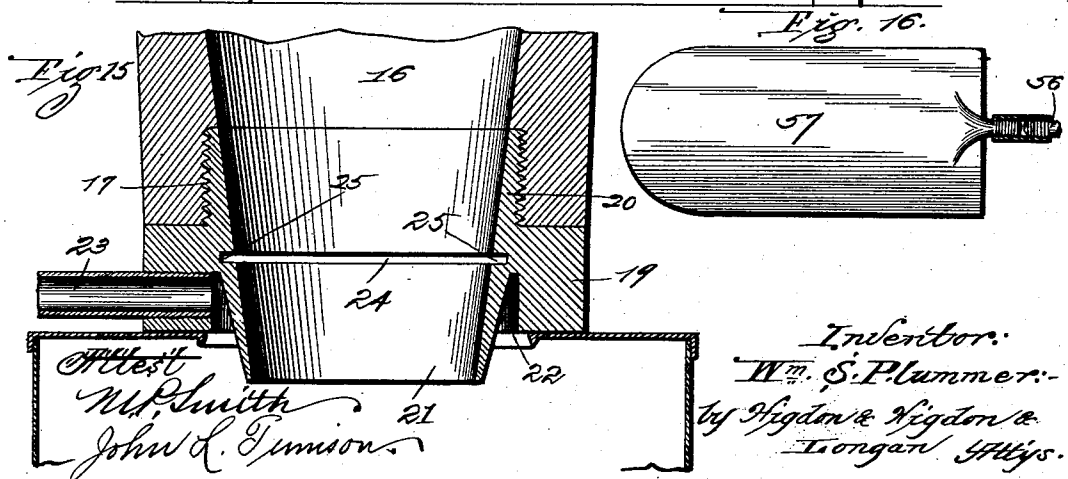
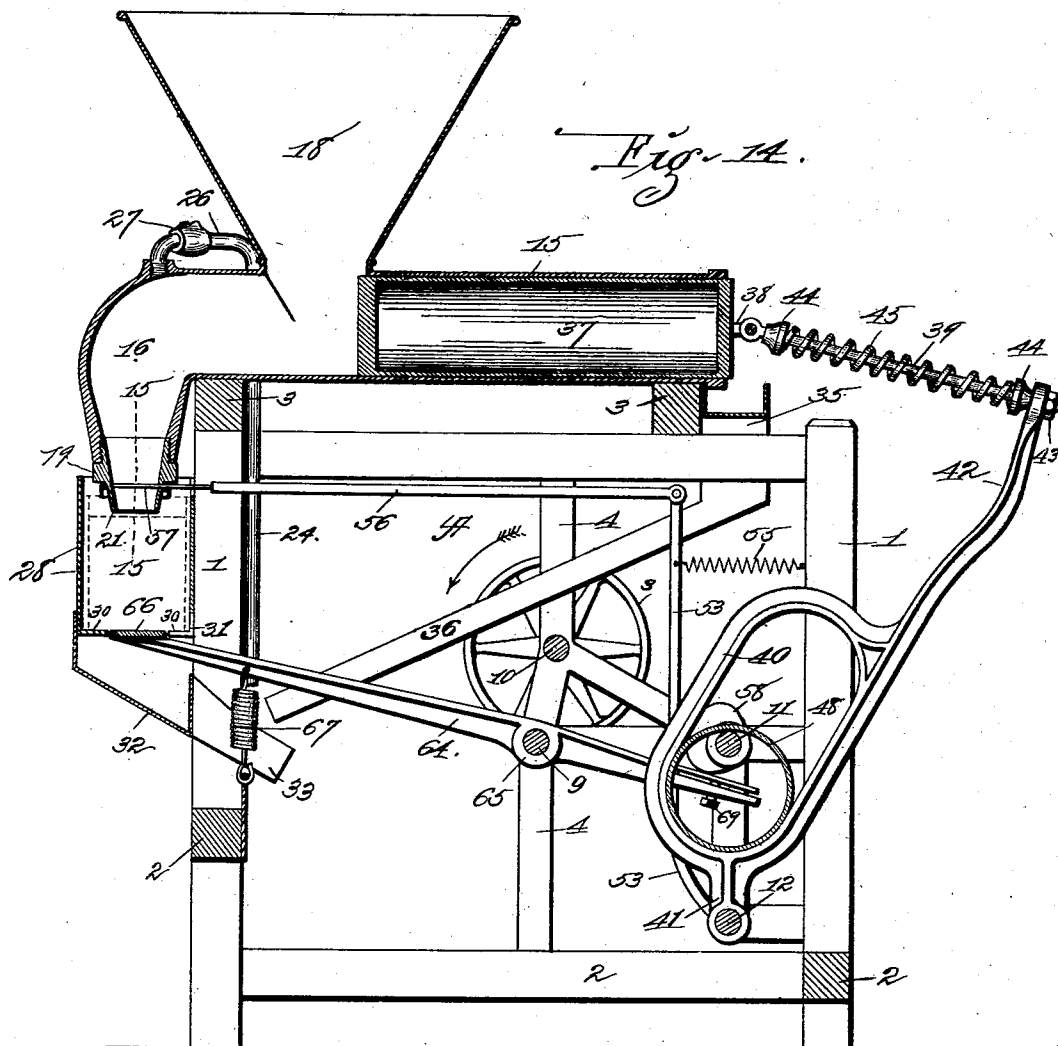
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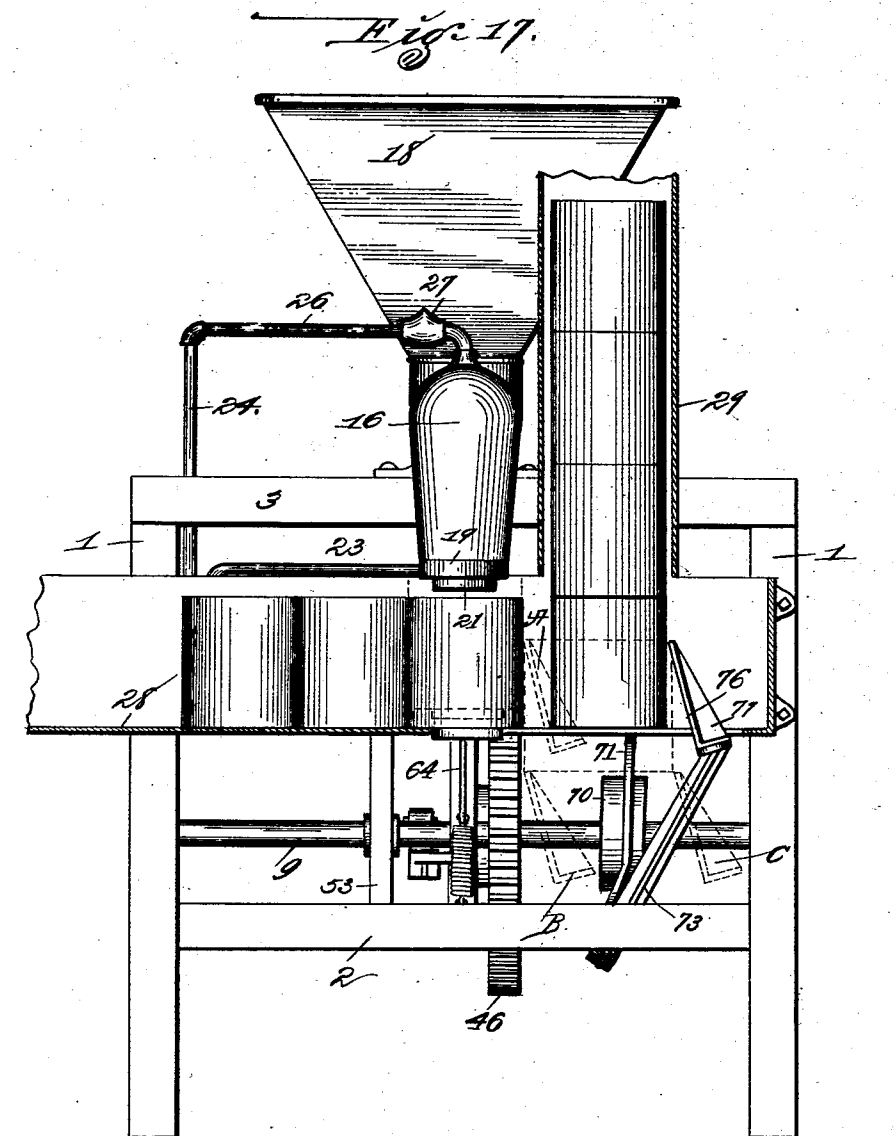
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Inventor:-
W. S. Plummer:-
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UNITED STATES PATENT OFFICE.

WILLIAM S. PLUMMER, OF ST. LOUIS, MISSOURI.

CAN-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 569,030, dated October 6, 1896.

Application filed February 10, 1896. Serial No. 578,818. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. PLUMMER, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Can-Filling Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to an improved can-filling machine; and it consists in the novel construction, combination, and arrangement of parts hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of my improved can-filling machine. Fig. 2 is a view in perspective of the end of one of a pair of moving levers of which I make use in carrying out my invention. Fig. 3 is a side elevation of an eccentric-cam made use of in carrying out my invention. Fig. 4 is a top plan view of this eccentric-cam. Fig. 5 is a longitudinal sectional view of a plunger that operates in the feeding-cylinder. Fig. 6 is a top plan view of my improved can-filling machine. Figs. 7 and 8 are side elevations of eccentrics made use of in carrying out my invention. Fig. 9 is a view in perspective of one end of an arm made use of in my improved machine. Fig. 10 is a view in perspective of the end of another arm. Fig. 11 is a side elevation of an eccentric made use of to move the arm to which the plunger is attached. Fig. 12 is a side elevation of an arm that moves the plunger. Fig. 13 is a detail side elevation, partly in section, showing one end of one of the moving arms. Fig. 14 is a longitudinal sectional view taken approximately on the indicated line 14 14 of Fig. 6. Fig. 15 is an enlarged sectional view taken approximately on the indicated line 15 15 of Fig. 14. Fig. 16 is a plan view of a cut-off made use of in my improved can-filling machine. Fig. 17 is a vertical sectional view taken approximately on the indicated line 17 17 of Fig. 1.

Referring by numerals to the accompanying drawings, 11 indicate suitable upright corner-posts that are framed together with suitable cross-pieces 2. Fixed upon and extending transversely across the top of the framework so formed are cross-pieces 3. Fixed to the top and bottom frame-pieces 2

at the sides of the machine and to the rear end posts thereof are suitably-formed cast frames 4. Formed in these frames 4 at points approximately in the center of the sides of the framework are journal-bearings 5, and short distances above these journal-bearings 5 and in the frames 4 are formed journal-bearings 6. Formed in said frames 4, in horizontal alinement with the journal-bearings 5 and adjacent the rear end posts 1, are journal-bearings 7, and directly beneath said journal-bearings 7 in the frames 4 and adjacent the lower side pieces 2 are journal-bearings 8. Mounted for rotation in the journal-bearings 5 is a shaft 9.

Shafts 10, 11, and 12, identical in form and size with the shaft 9, are journaled, respectively, in the horizontally-alined journal-bearings 6, 7, and 8. Upon said shaft 10, outside the framework of the machine, is rigidly fixed a driving wheel or pulley 13, and upon said shaft 10, between the frames 4, is fixed a small gear-wheel 14. Horizontally arranged upon the cross-pieces 3 at a point midway between the sides of the frame is a cylinder 15, the rear end of which is open and the forward end 16 of which is bent or turned downwardly at right angles to said cylinder 15, and the lower end of said downwardly-bent portion is reduced somewhat in diameter and provided on its interior with a screw-thread 17. Formed on or fixed to the cylinder 15 immediately in the rear of the downwardly-turned forward end thereof is a hopper 18.

19 indicates an annular ring provided with an upwardly-extending exteriorly-screw-threaded portion 20, which is of proper size to fit the interiorly-screw-threaded lower end of the downwardly-bent portion 16. Said ring 19 is also provided with a downwardly-pending annular portion 21, which performs the function of a discharge-nozzle for the cylinder, and between said downwardly-pending portion 21 and the ring 19 is formed an annular recess or space 22, passing through the annular ring 19, and communicating with the annular recess or space 22 is a horizontally-arranged tube 23. Extending horizontally through one side of the annular ring 19 is a horizontally-arranged slot 24,

that communicates with an annular recess 25 formed on the inner face of the ring 19. Communicating with the extreme forward end of the cylinder 15, and at a point immediately above the downwardly-turned end 16 thereof, is one end of a length of horizontal pipe 26, in which is located a check-valve 27.

Located upon the front of the framework is a horizontally-arranged metallic chute 28, the same being of such a size as to admit the free passage of ordinary cans therethrough. Communicating with this chute 28 to one side of the downwardly-turned end 16 of the cylinder 15 is an ordinary chute 29, through which the cans descend to the horizontally-arranged chute 28. The bottom of the chute 28 immediately below the chute 29 and below the lower end of the discharge-nozzle at the end of the downwardly-turned end 16 is removed and flanges 30 are formed at the lower end of each side wall of said chute 28. A slot 31 is formed in the front wall of the chute 28 immediately below the downwardly-turned end 16 of the cylinder 15. Located immediately below this chute 28 and extending entirely across the front of the frame is a drain-trough 32, the end 33 thereof discharging at the side of the machine on which the belt-wheel 13 is located.

To the outer end of the pipe 26 is fixed, by means of an ordinary elbow, a vertical pipe 34, the lower end of which discharges into the drain-trough 32, and the outer end of the horizontally-arranged pipe 23 is turned downwardly and also discharges into said drain-trough 32.

Located upon top of the rectangular frame and leading from the rear end of the cylinder 15 to the side of said frame is a drain-trough 35, the same having fixed to its end a drain-trough 36, that leads to the drain-trough 32 and discharges therein. Arranged to slide through the cylinder 15 is a cylindrical plunger 37, the same being provided on its rear end with a pair of perforated ears 38. Pivoted between this pair of perforated ears 38 is the forward end of a rod 39.

40 indicates an oblong loop, semicircular at both ends, and said loop is provided on its lower end with a journal-bearing 41, through which journal-bearing passes the shaft 12. The oblong loop 40 surrounds the shaft 11, and formed integral with and extending upwardly from said loop 40 is an arm 42, through the extreme upper end of which passes the outer end of the rod 39. A nut 43, located upon the outer end of said rod 39, retains the upper end of said arm 42 upon said rod. Loosely mounted upon said rod 39, adjacent its ends, are collars 44, and located upon said rod 39 and interposed between said collars 44 is an expansive coil-spring 45.

46 indicates a gear-wheel that is rigidly fixed upon the shaft 11, adjacent the loop 40, and said gear-wheel 46 meshes with and is driven by the pinion 14.

47 indicates an eccentric that is constructed with a peripheral flange 48. The diameter of this eccentric 47 corresponds to the inner width of the loop 40, and said flange 48 upon said eccentric 47 operates within said loop 40.

Formed in the body of the eccentric 47 is a slot 49, of such a size as to admit the hub of the gear-wheel 46. Immediately above this slot 49 is a smaller slot 50, through which is arranged to pass a bolt 51, the same extending laterally from one of the spokes of the gear-wheel 46 when the eccentric is properly positioned against said gear-wheel. A nut 52 is located upon this bolt 51 and very effectually clamps said eccentric to the gear-wheel.

53 indicates a vertically-arranged arm that is provided with a hub 54 at its lower end, and said hub 54 is loosely journaled upon said shaft 12. Said arm is curved upwardly and inwardly to a point immediately below the rear end of the cylinder 15. A retractile coil-spring 55 is secured at its forward end to the upper end of this arm 53, and at its rear end to a portion of the frame of the machine. To the upper end of this arm 53 is pivoted the rear end of a horizontally-operating rod 56, to the forward end of which is adjustably fixed a cut-off slide 57, the same being of such a width as to allow its free movement through the slot 24, and the forward end of said cut-off slide 57 is rounded, in order that it may fit in the annular recess 25, formed in the interior face of the annular ring 19.

Fixed upon the shaft 11 is an eccentric 58, the same being provided with a hub 59, a set-screw 60 passing through said hub, whereby said eccentric is held in proper position upon said shaft. Located upon said shaft 11, adjacent the eccentric 58, is an eccentric 61, which is so constructed as that it will give a shorter and quicker stroke than will the eccentric 58, and said eccentric 61 is provided with a hub 62, a set-screw 63 passing through said hub, which serves as a means for very rigidly holding said eccentric upon said shaft. This eccentric 61 operates directly upon the rear face of the vertically-arranged arm 53.

64 indicates an arm that is provided near its rear end with a journal-bearing 65, through which journal-bearing passes the shaft 9, and the forward end of said arm 64 passes between the drain-trough 32 and the chute 28, and said forward end is constructed with an integral plate 66, that is normally positioned directly beneath the discharge-opening at the lower end of the downwardly-turned portion 16. The upper end of a retractile coil-spring 67 is secured to the forward end of this arm 64, and the lower end of said coil-spring is attached to a portion of the frame of the machine. The rear end of this arm 64 extends to a point directly beneath the eccentric 58, and upon the upper face of said rear end is bolted a spring bearing-plate 68, upon which the periphery of the eccentric 58 engages. A set-screw 69 passes through the rear end of the arm 64

and engages directly against the under side of the spring bearing-plate 68. Said set-screw 69 is provided with the usual head, and by manipulating said set-screw the spring bearing-plate 68 is raised or lowered.

Located upon the shaft 11 and upon the opposite side of the gear-wheel from which the eccentric 47 is fixed is an eccentric 70, which also performs the function of a cam, and said eccentric is provided around its entire circumference with a bearing-flange 71 and in the center with a hub 72, through which hub passes the shaft 11.

73 indicates an arm that is provided with an integral projection 74 adjacent its center, through the upper end of which projection passes the shaft 9. The rear end of said arm 73 is curved downwardly, and a pair of pins 75 project upwardly from said rear end. The forward end of this arm 73 projects through the open lower end of the chute 28 and is provided with an upwardly-extending finger 76, on the rear face of which is formed an inclined flange 77. This finger extends upwardly through the chute 28 and operates immediately below the chute 29.

The operation is as follows: When the various parts of the machine are in proper location and adjustment and a series of cans are located in the vertical chute 29, the product that is to be canned is discharged or fed into the hopper 18. When the plunger 37 is at its rearward limit of movement, the product from said hopper will gravitate into the forward end of the cylinder 15 and into the downwardly-turned end 16 and discharge-nozzle thereof. While the plunger 37 is at its rearward limit of movement and while it is moving rearwardly the plate 57 must necessarily be at its forward limit of movement and cut off all passage through the discharge-nozzle, and this is regulated by properly locating the eccentric 58 upon the shaft 11, said eccentric 58 engaging against the vertically-arranged arm 53, that is attached to the arm 56, leading to said cut-off plate 57. A driven belt is arranged around the pulley 13, and said pulley is thereby moved in the direction of the arrow A, Fig. 14. This necessarily rotates the shaft 10, and the pinion 14 upon said shaft will likewise be rotated. Rotary motion from said pinion 14 will be imparted to the gear-wheel 46, with which said pinion meshes, and said gear-wheel 46 being fixed upon the shaft 11 said shaft 11 will necessarily be rotated, and as the eccentrics 58, 61, and 70 are fixed upon said shaft 11 said eccentrics will be rotated. As the gear-wheel 46 rotates, the eccentric 47, carried by said gear-wheel, will operate in the loop 40 and cause said loop 40 and arm 42, formed integral therewith, to oscillate or swing from the shaft 12, to which it is journaled. As the upper end of the arm 42 moves toward the rear end of the cylinder 15 the plunger 37 will be moved inwardly through said cylinder 15

and force whatever product has gravitated into said cylinder 15 and downwardly-turned end 16 out through the discharge-nozzle located at the lower end of said downwardly-turned end 16 and into a can which has been moved by the proper parts of the machine (hereinafter described) to a point directly beneath the discharge-nozzle. Simultaneous with the forward movement of the plunger 37 the eccentric 58 in its rotation engages with the bearing-plate 68 on the rear end of the arm 64 and slightly oscillates said arm, this movement necessarily throwing the forward end of said arm and plate 66, formed integral therewith, upwardly, and the can which is located upon said plate 66 will be moved upwardly until the top thereof engages directly against the under side of the ring 19. The downwardly-pending annular flange 21 extends through the opening in the top of this can, and as the cut-off plate 57 is now drawn backwardly by the power stored in the retractile coil-spring 55, attached to the arm 53, the product will be discharged through the discharge-nozzle and into the can. The air within said can, as the product discharges thereinto, will rise in said can and pass through the annular recess 22, formed in the under side of the ring 19, and from thence pass outwardly through the pipe or tube 23 to be discharged from the open end thereof. As the eccentric 58 continues in its rotation and the wider portion thereof leaves the plate 68 the retractile coil-spring 67 will draw the forward end of the arm 64 downwardly, and consequently the can which is now filled with the product is allowed to assume its normal horizontal plane and rest upon the flanges 30 in the lower end of the chute 28. At the beginning of this movement just described the finger 76 on the forward end of the arm 73, owing to the proper positioning of the eccentric-cam 70 upon the shaft 11, was in the position indicated by dotted lines A, Fig. 17. This position it assumes at the completion of its upper horizontal stroke, or when it has moved a can onto the plate 66 and immediately beneath the discharge-nozzle. The peculiar construction of the eccentric-cam 70, operating between the pins 75 on the rear end of the arm 73, now causes the finger 76 on the forward end of said arm to gravitate downwardly until it assumes the position as indicated by dotted lines B, Fig. 17, which is in a horizontal plane below the plane occupied by the chute 28. Said finger is now moved rearwardly in a horizontal plane to the position as shown by dotted lines C, Fig. 17, and with the completion or last quarter of a revolution of the eccentric-cam 70 the finger 76 will be moved vertically upward into the chute 28 and into the position as indicated by solid lines in Fig. 17. This position is immediately in the rear of a can which has gravitated onto the flanges 30 in the chute 28. As these movements are continued the cans

passing downwardly through the chute 29 are in turn moved by the finger 76 to a point directly beneath the discharge-nozzle of the downwardly-turned end 16, and as each can assumes this position it is carried upwardly by the plate 66 on the end of the arm 64, the cut-off plate 57 moves rearwardly, the product is discharged into the can, said can again lowers onto the flanges 30 in the chute 28, and said can is moved outwardly along said chute by the bringing into position of another can. Any overflow or leakage from the forward end of the cylinder 15 gravitates into the trough 32 and discharges therefrom through the end 33. Any leakage from the rear end of the cylinder 15 discharges into the trough 35 and from thence through the trough 36 into the discharge-trough 33. To overcome the suction caused by the backward movement of the plunger 37, which might withdraw the contents from the newly-filled can, the pipe 26 is located at the extreme forward end of the cylinder 15. Through said pipe and through the check-valve 27 air is allowed to discharge into the forward end of said cylinder with this backward movement of the plunger 37, and by locating the check-valve 27 in said pipe the product cannot be forced outwardly through said pipe with the forward movement of the plunger. The distance which the plate 66 travels is regulated by raising or lowering the plate 68 and by loosening or tightening the set-screw 69. The action of the various arms, the cut-off, and the loop and arm for operating the plunger are all regulated by the proper location of the eccentrics 58, 61, 70, and 47. Owing to the interpositioning of the coil-spring between the collars 44, located upon the rod 39, the movement from the arm 42 to the plunger 37 is not sudden, but of a yielding character. The can succeeding the one moved to a point beneath the discharge-nozzle will gradually gravitate downwardly as it strikes and engages upon the inclined flange 77 on the rear side of the finger 76. Thus the empty cans passing through the chute 29 jam or become dented by gravitating or dropping downwardly onto the flanges 30.

A machine of the class described is simple, positive, and automatic in all its movements, saves much time and labor during the filling of cans, and possesses superior advantages in point of simplicity, durability, and general efficiency.

I claim—

1. In a machine of the class described, a hollow cylinder fixed in horizontal position and having its rear end open and its forward end bent downwardly at right angles to the body of said cylinder, said forward end being somewhat contracted in size, a discharge-nozzle attached to and depending downwardly from said forward end, an air-discharge pipe communicating with the interior of said dis-

charge-nozzle, a plunger operating in the body of said cylinder, a pipe penetrating said cylinder at a point in front of the path of said plunger, an inlet-valve in said pipe, a hopper positioned above said cylinder and connecting with the interior thereof, and means for operating said plunger, which means consists of the pair of perforated ears 38 attached to the rear end of said plunger, the rod 39 having its forward end pivoted between said ears 38, the oblong loop 40, the journal-bearing 41 attached to the lower end of said loop 40, the shaft 12 passing through said journal-bearing 41, the arm 42 attached to the upper end of said loop, the rod 39 having its outer end passing through the extreme upper end of said arm 42, the collars 44 loosely mounted upon said rod 39, the expansive coil-spring 45 mounted upon said rod 39 between said collars 44, the gear-wheel 46 rigidly fixed upon the shaft 11 adjacent the loop 40, the pinion 14 mounted upon the shaft 10 between the frames 4 and meshing with said gear-wheel 46, and the eccentric 47 having the peripheral flange 48 arranged to operate in said loop 40, said eccentric 47 having the slot 49 to admit the hub of the gear-wheel 46 and the slot 50 through which passes the bolt 51, said bolt being fixed to one of the spokes of the gear-wheel 46, substantially as stated.

2. In a machine of the class described, the vertical can-chute, the horizontal can-chute and means of passing the cans from said vertical can-chute to said horizontal can-chute, which means consists of the eccentric 70 located upon the shaft 11, the bearing-flange 71 extending around the entire circumference of said eccentric, the hub 72 at the center of said eccentric through which hub passes the shaft 11, the arm 73 having the integral projection 74 at its center, the shaft 9 passing through the upper end of said projection 74, the rear end of said arm 73 being curved downwardly and having the pair of pins 75 projecting upwardly from said rear end, the upwardly-extending finger 76 attached to the forward end of said arm 73, the inclined flange 77 on said upwardly-extending finger, and means for operating said shaft 11, substantially as stated.

3. In a machine of the class described, the combination with a discharge-nozzle of a horizontal can-chute and means for raising a can against said nozzle to be filled, which means consists of the eccentric 58 fixed upon the shaft 11, said eccentric being provided with the hub 59 and the set-screw 60, the arm 64 having the journal-bearings 65 provided near its rear end, through which journal-bearings passes the shaft 9, the plate 66 attached to the forward end of said arm 64, said plate being normally positioned beneath the discharge-nozzle, the retractile coil-spring 67 attached to the forward end of said arm 64, the lower end of said spring being attached to a portion of

the frame of the machine and the lower end of said arm 64 being positioned directly beneath the eccentric 58, the spring bearing-plate 68 attached to the upper face of said
5 lower end of said arm 64, said eccentric 58 operating directly upon said spring bearing-plate, the set-screw 69 passing through the rear end of said arm 64 and engaging directly against the under side of said spring bearing-

plate for the purpose of adjusting the same, 10 substantially as stated.

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

WILLIAM S. PLUMMER.

Witnesses:

EDWARD E. LONGAN,

JOHN C. HIGDON.