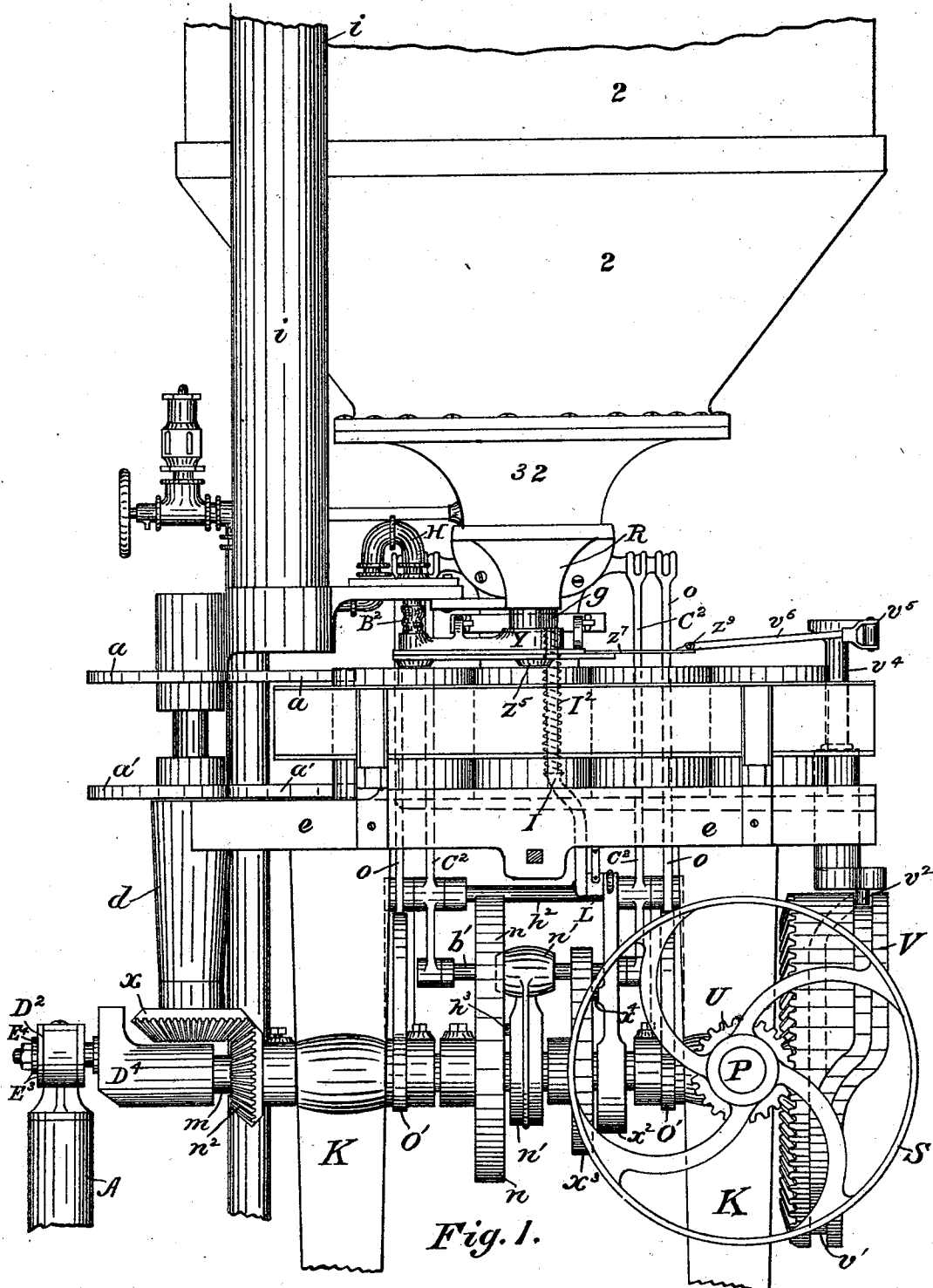


2 Sheets—Sheet 1.

No. 506,137.

Patented Oct. 3, 1893.



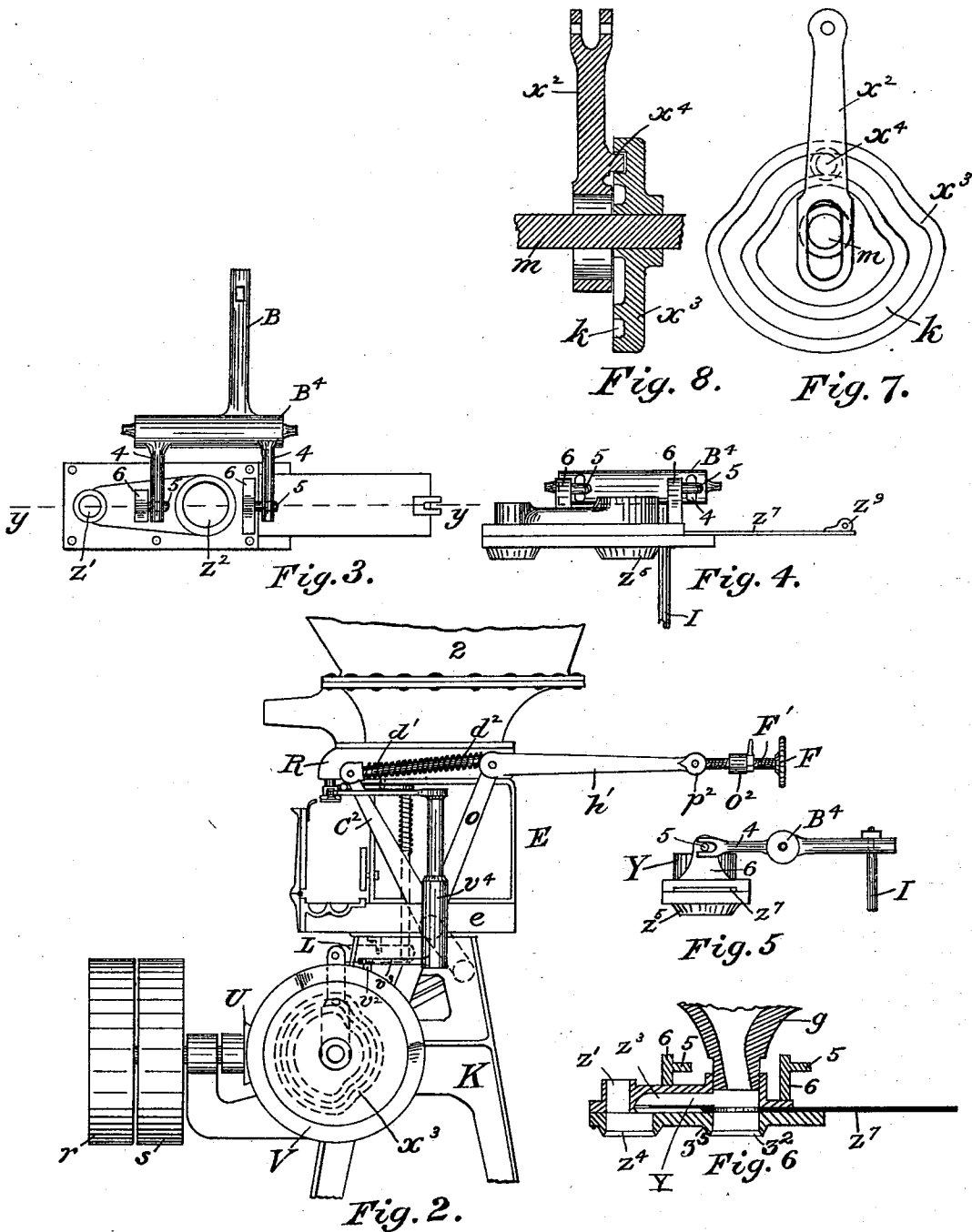
Witnesses
A. C. Berry.
Geo. N. Fernald

Inventor:
Frank W. Smith
BY *Geo. E. Bird* ATTORNEY

F. W. SMITH.
CAN FILLING MACHINE.

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UNITED STATES PATENT OFFICE.

FRANK W. SMITH, OF PORTLAND, MAINE, ASSIGNOR TO RICHARD O. CONANT,
OF SAME PLACE.

CAN-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 506,137, dated October 3, 1893.

Application filed May 3, 1893. Serial No. 472,873. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. SMITH, a citizen of the United States, residing at Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Can-Filling Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to machines for filling cans and consists of certain improvements upon the machine shown in Letters Patent No. 360,541, granted April 5, 1887, to Henry R. Stickney, 2d.

These improvements relate to the nozzle through which the corn is introduced into the cans, a valve for controlling the nozzle and means for operating the valve.

Referring to the drawings:—Figure 1. is the front elevation of the machine. Fig. 2. is a side elevation of the same. Fig. 3. is a plan of the valve chamber; Fig. 4. a side elevation of the same; Fig. 5. an end elevation of the same; Fig. 6. a section of the valve chamber on the line *y y* of Fig. 3 of the nozzle of the charge chamber. Fig. 7. is a side elevation of the cam α^3 and link α^2 . Fig. 8. is a transverse vertical section of the same.

With the exception of the nozzle, the valve chamber and slide and the means for operating the same, the machine shown in the drawings is constructed substantially as shown in the Letters Patent above referred to.

This machine is designed to be used in connection with a cooking device whereby the corn or other vegetables are cooked and carried by gravity or otherwise into a suitable hopper from which they are fed into the cans by the can-filler. But the machine may, of course, be used independently of a cooker.

In Fig. 1, 2 represents a cooking device supported upon a hopper 32 which terminates in and communicates with a horizontal elongated charge-chamber R. These parts rest upon a casting upon the table *e*, which like other parts of the machine, is supported by the frame K. The charge-chamber R has a semi-circular cross section and is open at the top where it connects with the hopper 32. The filling nozzle *g* leads from the forward

end of the charge-chamber R, its opening being downward and its distance from the table *e* being slightly greater than the height of the can. The contents of the charge-chamber may be forced into the nozzle by a plunger, as shown in the patent above referred to. The passage through the nozzle, however, is not vertical, but is inclined obliquely and preferably toward that end of the valve chamber, hereinafter described, from which the slide is operated, as shown in Fig. 6.

Beneath the nozzle *g* is the valve chamber Y. This valve chamber has an opening α^2 extending through it from top to bottom, the upper part of the opening being so constructed as to fit snugly around the nozzle *g*, while the lower part or boss α^5 is made of such size and shape as to closely fit within the groove around the opening of the can.

Between the opening α^2 and the end of the valve chamber, opposite to that from which the slide is operated and upon the under side of the valve chamber is an opening α^4 equal in diameter to the opening α^2 and so located that the distance of its center from the center of the opening α^2 shall be equal, or very slightly larger than, the diameter of the can. This opening α^4 is divided into substantially equal portions diametrically by a wing or partition extending at right angles to the length of the valve chamber Y. One of the subdivisions of the opening thus formed is connected by a passage α^3 within the valve chamber Y with the opening α^2 , the other portion of the opening communicating with the passage α^1 , which extends upward through the upper portion of the valve chamber: see Fig. 6. Closely connected within the passage α^1 is a flexible rubber tube B², the upper end of which is closely united with the tube H: see Fig. 1.

Sliding horizontally in an appropriate groove within the valve chamber Y is the plate α^7 which is of sufficient length to close the opening α^2 and the opening α^3 and is provided with a circular opening of substantially the same size as α^2 , which opening is so located in the slide that when it registers with the opening α^2 the passage α^3 connects with the opening α^4 , and when the slide is pushed in to close the opening α^2 the opening of the passage α^3 is also closed. The outer end of the

slide z^7 is provided with an eye z^9 within which is pivotally connected the rod v^6 which extends and is pivoted to a crank v^5 upon the head of the rocker shaft v^4 : see Fig. 1. At the lower end, the rocker shaft is provided also with a crank v^3 having in its lower surface the pin or projection v^2 adapted to run in the cam-path v' . This cam-path is formed in the periphery of the beveled gear V which is fixed to the shaft m .

At right angles to the shaft m , but in the same horizontal plane with it, is the shaft P carrying the pulley S, by which power is imparted to the machine, and also the gear U which matches with the gear upon the side of the wheel V. The cam-path v' extends continuously around three-quarters of the periphery of the wheel V and through the remaining quarter in a plane at the right of and parallel with the other three-quarters.

In the rear of the valve chamber Y and slightly above it and journaled in the frame work of the machine is the roller B⁴ from which upon one side extend the arms 4, 4, the ends of which are bifurcated and embrace within the bifurcations the pins 5 upon the ears 6 which are secured to the top of the valve chamber Y on either side of the opening z^2 . From the other side of the roller B⁴ extends the arm B, the rear end of which is provided with a slot through which the upper end of the rod I passes and is held by a nut. The upper part of the rod I is surrounded by a stiff spiral spring I², the lower end of which rests against a stop surrounding the rod I and the upper end against the end of the arm B. The lower end of the rod I is pivoted to the lever L which has a bearing on the frame and the other end of which is pivotally connected with the link x^2 . This link is provided at its lower end with an elongated slot embracing the shaft m and somewhat above the slot with a projection or pin carrying a roller x^4 , which runs in the groove k of the path-cam x^3 which is fixed upon the shaft m . The groove or path k of this cam is concentric with its shaft except at two points where it becomes eccentric, being deflected toward the center: see Fig. 7.

The operation of the improvements described is as follows:—The cans being fed through the chute and over the table, as set forth in Letters Patent of Stickney; assume the valve chamber and slide to be in the position and condition in which it is immediately after a can has been filled. Another can is advanced by the action of the cams a a' until the stud of the can is directly beneath the opening z^2 of the valve chamber. The revolution of the cam x^3 now brings the roller x^4 within the eccentric portion of the cam-path k and thus depresses the link x^2 and by means of the lever L raises the rod I which in turn elevates the rear end of the lever B and depresses the arms 4, 4 which are connected with the valve chamber Y by means

of the ears 6, 6, as described, thus causing the wall or boss z^5 of the opening z^2 to press closely down within the groove surrounding the opening of the can, so that none of the liquid can pass between the can and the boss z^5 . The opening of the next unfilled can is just beneath the opening z^4 of the valve. The charge-chamber being now filled and separated from the hopper by the cut-off plate, the slide z^7 of the valve chamber Y is drawn out until the circular opening in the slide registers with the opening z^3 as follows: The projection v^2 , entering that portion of the cam-path v' which is most distant from the teeth of the gear V turns the rocker shaft and the crank at its head away from the valve chamber Y and with it the rod v^6 which withdraws the slide z^7 , as described. The plunger now forces the contents of the charge-chamber through the nozzle g and the valve chamber Y into the can. Should the charge for any reason exceed the capacity of the can the surplus corn is forced through the passage z^3 into the next unfilled can, and at the same time, if the valve of the pump be so arranged that the sirup is discharged through the nozzle B², the proper amount of sirup is forced through the opening z' into the can which has received the surplus corn. The projection v^2 now enters that portion of the cam-path v' which is near the teeth of the gear V and swings the rock shaft v^4 toward the valve chamber Y and thus by means of the lever or rod v^6 pushes the slide z^7 into the valve chamber Y closing both the opening z^2 and the opening of the passage z^3 . The valve chamber Y is now raised by a movement the reverse of that which depressed it; i. e., the roll x^4 now passes within the concentric portion of the cam-path k whereby the link x^2 is raised and the action of the levers reversed. The charge plate is now withdrawn, the charge-chamber filled with corn, as before, the row of cans advanced and the next can filled as before. By means of a pump or an elevated reservoir a certain amount of liquid, sirup, water, &c., may be delivered through the pipe B² into the can next in rear of that being filled. Should a can descend through the chute with the bottom-end up, injury to the can and to the machine is avoided by means of the arrangement of the rod I and spring I², the upper end of the rod passing through a slot in the rear end of the lever B, the spring being strong enough to elevate the rear end of the lever B when the valve chamber Y properly registers with the stud of the can. The passage through the nozzle g being made oblique in order to facilitate the filling of the cans when the passage registers precisely and is of the same size with the opening of the can, no opportunity is afforded for the exit of the air in the can as it is driven out by the entrance of the corn. By making the passage smaller than the opening and causing the column of corn to enter at one

side and obliquely, the air of the can may pass up through the other part of the opening as the can is filled and the air displaced.

What I claim is—

5 1. In a can-filling machine, the combination of the inclined nozzle whereby the material to be canned is delivered, a lateral
10 overflow beneath its end leading to the adjoining can filling opening, the boss under the mouth of the nozzle on which the can
15 may be fitted, the nozzle being of less size than the boss, whereby the filling stream may be delivered at one side of the can thereby allowing free escape of air from the can; substantially as described.

2. In a can-filling machine, the combination of an inclined nozzle through which the material to be canned is delivered, a lateral
20 overflow beneath its end leading to the adjoining can filling opening, a boss on the valve chamber below on which the can is fitted and the valve in the overflow chamber between the lower end of the nozzle and the
25 boss, whereby the overflow from the can directly under the nozzle is carried to the adjoining can, substantially as described.

3. A can-filling machine having in combination a charge chamber or hopper with a discharge passage, said passage being obliquely
30 inclined and of less size than the opening of the can and an exhaust passage communicating with the opening of the can, substantially as described.

4. In a machine for filling cans, the combination of a nozzle provided with a valve
35 chamber, the latter having means for raising and lowering the same and having an opening beneath said nozzle and another opening on the under side of said valve chamber connected by a passage within the valve chamber
40 with said first named opening substantially as described.

5. The combination of a charge-chamber having a discharge nozzle, the latter provided
45 with a valve chamber with means for raising and lowering the same, and having an opening beneath said nozzle adapted to register closely with the stud of the can and another opening on the under side of said valve chamber,
50 said openings being connected by a passage way, substantially as described.

6. In a machine for filling cans having an automatic mechanism for intermittently pushing the cans beneath the filling nozzle, a valve chamber surrounding said nozzle, hav- 55
ing an opening adapted to closely register with the can beneath the nozzle, another opening adapted to register with the stud of the next following can, said last named opening being divided by a partition, one part of 60
which said opening is connected with the said first named opening and the other part thereof is connected with a liquid discharge pipe, substantially as described.

7. In a machine for filling cans having automatic mechanism for intermittently pushing the cans beneath the filling nozzle, a valve chamber surrounding said nozzle having an opening adapted to closely register with the stud of the can beneath the nozzle, another 70
opening adapted to register with the stud of the next following can, a passage within the valve chamber connecting said openings a slide adapted to close said openings together with means adapted to raise and depress said 75
valve chamber substantially as described.

8. In a machine for filling cans, having automatic mechanism for intermittently pushing the cans beneath the filling nozzle, a valve surrounding said nozzle having an opening 80
adapted to closely register with the stud of the can beneath the nozzle, another opening adapted to register with the stud of the next following can, a passage within the valve chamber connecting said openings and a slide 85
adapted to automatically close both said openings at the same time with means for operating said slide.

9. The combination of the inclined nozzle *g*, the lateral overflow beneath it leading to the adjoining can-filling opening and the boss 90
*z*⁵, on which the can to be filled may be fitted, the sliding plate *z*⁷, in said overflow chamber and the outlet *z*⁴, leading from the chamber in the manner and for the purposes set forth. 95

In testimony that I claim the foregoing as my invention I have hereunto set my hand this 1st day of May, A. D. 1893.

FRANK W. SMITH.

In presence of—

GEO. E. BIRD,
A. C. BERRY.