

(No Model.)

2 Sheets—Sheet 1.

E. S. JUDGE.
CAN FILLING MACHINE.

No. 320,363.

Patented June 16, 1885.

Fig. 1.

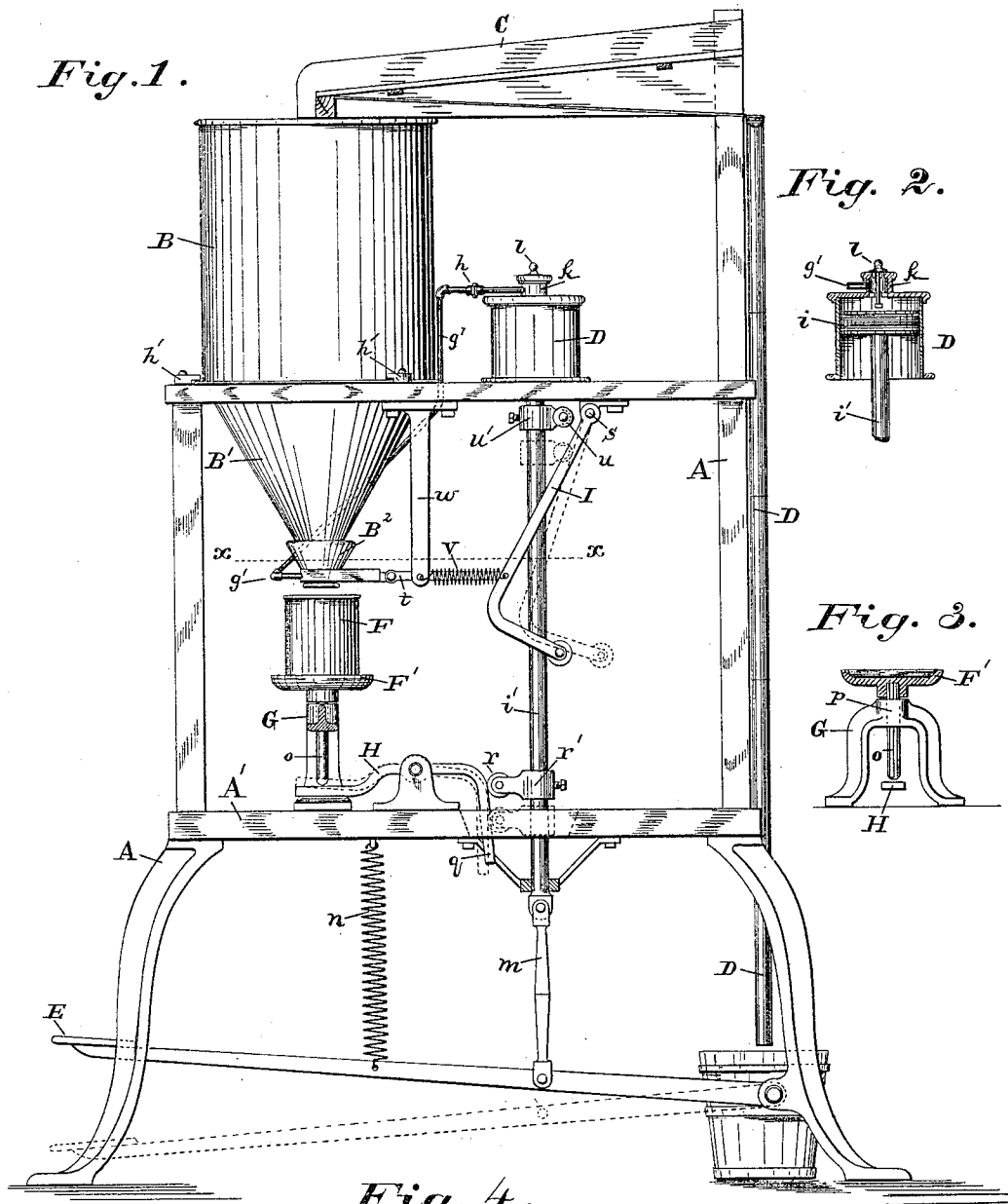


Fig. 2.

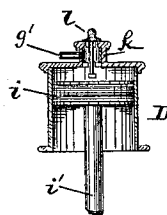


Fig. 3.

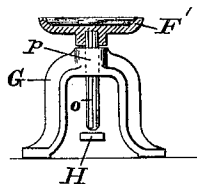
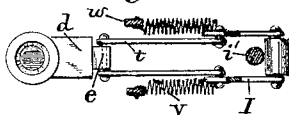


Fig. 4.



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Fig. 6.

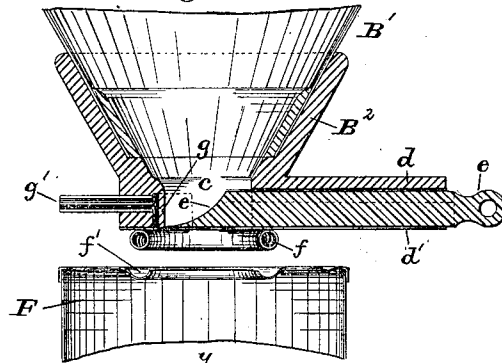


Fig. 7.

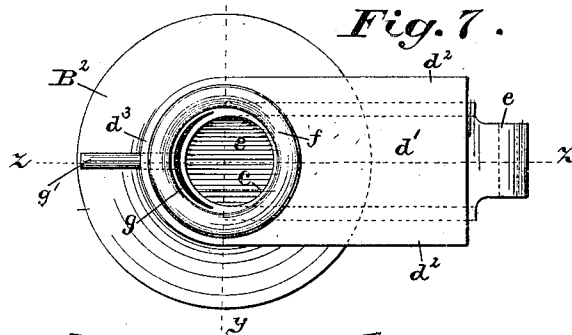


Fig. 8.

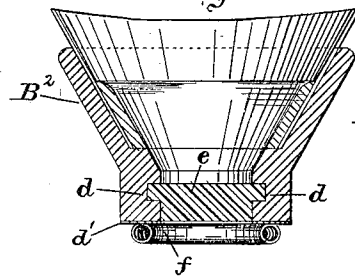


Fig. 9.



Fig. 10.

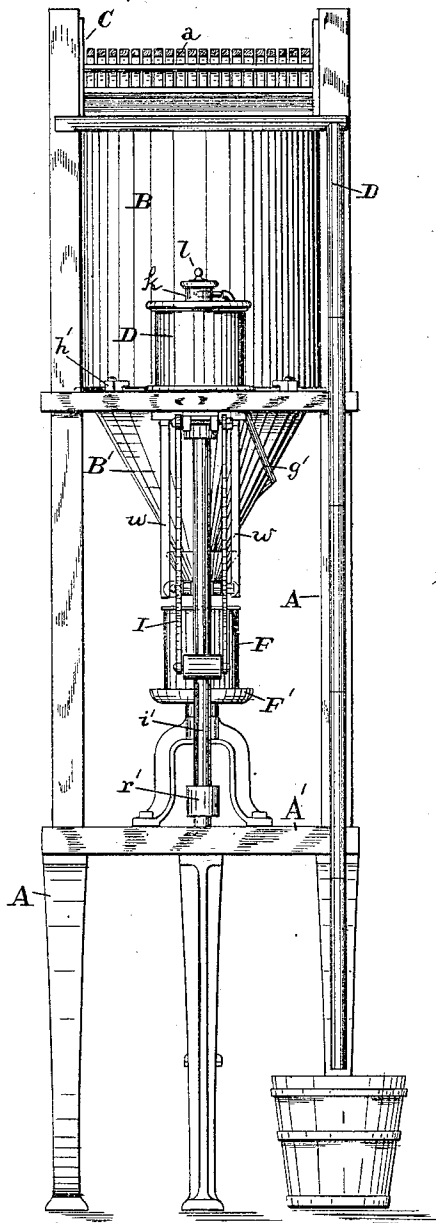
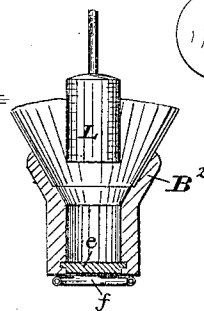


Fig. 5.

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UNITED STATES PATENT OFFICE.

EDWARD S. JUDGE, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE WAR-FIELD MANUFACTURING COMPANY, OF SAME PLACE.

CAN-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 320,363, dated June 16, 1885.

Application filed May 19, 1885. (No model.)

To all whom it may concern:

Be it known that I, EDWARD S. JUDGE, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Can-Filling Machines, of which the following is a specification.

My invention relates to an improved machine for filling cans, and is designed for use in packing-houses where vegetables, fruit, and meats, &c., are put up in cans.

The object of the invention is to provide, in combination with a can-filling machine, means for exhausting air from the can to be filled, to the end that the vegetable or other material will readily enter the can because of the vacuum or partial vacuum which the can presents. The construction whereby the desired result is accomplished will be described in connection with the accompanying drawings, which illustrate what is deemed the best means of carrying the invention into effect.

Figure 1 is a side elevation of a can-filling machine having my improvement. Fig. 2 is a vertical section of the pump or air-exhauster. Fig. 3 is a view of the can seat and lifter. Fig. 4 is a horizontal section at $x x$, showing the valve parts. Fig. 5 is a rear end elevation of the machine. Fig. 6 is a vertical section of a can, the hopper-bottom, and valve, the latter on the line $z z$. Fig. 7 is a bottom or inverted view of the valve. Fig. 8 is a vertical section of the hopper and valve on the line $y y$. Fig. 9 is a top view of the sliding cut-off of the valve. Fig. 10 shows a modification wherein a plunger is used.

The letter A designates the frame or stand which supports the various parts of the machine; B, the hopper which is to contain the vegetable or other material; C, the straining-trough, having a perforated or slatted bottom, a , to deliver the material into the top of the hopper, and a tight bottom, b , below, by which the juice or water drained from vegetables is directed to the pipe D.

The above-named parts are of the ordinary construction. The bottom of the hopper is funnel-shaped, as at B', and at the smallest part is provided with a discharge-orifice, c , which is controlled by a valve. The discharge-orifice and valve are constructed of and in a nipple, B², which has a horizontal grooved

slide, d , which projects at one side of the orifice, c , in which the sliding cut-off e moves. Below and in contact with the sliding cut-off e is a thin plate, d' , which has its parallel edges d^2 attached to the grooved slide d , and one of its ends, d^3 , attached to the side of the orifice opposite that where the grooved slide projects, while a hole in the thin plate, of the same size as the orifice, is coincident therewith. The sliding cut-off e , therefore, fits close against the thin plate d' below it. An elastic ring, f , (preferably a tubular rubber ring,) is attached to and below the thin plate d' , so as to surround the discharge-orifice, and serves to produce an air-tight connection around the top opening, f' , of the can F. By this construction the can-top may be brought up against the elastic ring, and then the cut-off e moved sidewise away from the orifice c , whereupon any vegetable or other material in the hopper may pass down into the can, and means to facilitate this by first exhausting air from the can comprises the leading feature of my invention. At one side of the discharge-orifice c is an air-exhaust opening, g . (See Figs. 6 and 7.)

It will be seen the orifice c , for discharging the vegetable or other material from the hopper into the can, and the opening g , for exhausting air from the can, are both surrounded by the elastic ring f , so that the latter makes a tight connection for both. A pipe or tube, g' , enters the side of the nipple B², where it connects with the exhaust-opening, and from the side of the nipple the said pipe g' extends upward, close alongside of and attached to the hopper, and thence to the air-pump D. Provision is made for disconnecting the exhaust-pipe from the air-pump by means of a coupling, h . When so disconnected, the hopper, with the exhaust-pipe attached, may be lifted from its seat. The hopper is retained to its seat in the frame by any suitable means, h' , capable of resisting the force exerted by the can-lifting mechanism below. The air-pump is a simple cylinder, D, having an open bottom, (see Fig. 2,) and provided with a piston, i , to which a piston-rod, i' , is attached. On top of the pump-cylinder is a dome, k , to which preferably the exhaust-pipe g' is attached. The crown of this dome has a valve, l , which closes when the piston moves down at time of

exhausting air from the can, and opens when the piston moves up to allow the air in the pump-cylinder to escape. The lower end of the piston-rod in the present instance connects
 5 with a treadle, E, by means of a connecting-rod, m, and a spiral spring, n, has one end attached to the treadle and the other end to the table A' of the frame. When the treadle is depressed, the piston i moves down, which re-
 10 sults in exhausting the air from the can. Upon removing the foot from the treadle the spring n acts to raise both treadle and piston.

It is obvious that the air-exhauster may be operated by other means and power than the
 15 foot-treadle. It may have its piston-rod connected with a crank driven by steam or other power. The can F is lifted against the elastic ring f, and movement is imparted to the cut-off e by the following mechanism: A can-seat,
 20 F', has a shank, o, projecting down below it, and a suitable stand, G, supports the can-seat while the shank o passes loosely through a hole, p, in the stand. By this construction the can-seat may be lifted vertically. A lever,
 25 H, is pivoted above the table, and one end has position below the can-seat shank o, and the other end, q, is bent down. A friction-roller, r, is attached to a collar, r', fixed on the piston-rod i', and is in position to press
 30 against the down-bent end q of the lever H. When the piston-rod moves up, the friction-roller r is released from engagement with the lever, and the can-seat lowers by its own gravity. When the rod moves down, the roller r
 35 presses against the down-bent end of the lever, and thereby tilts it, which lifts the can-seat F' and presses the top of the can against the elastic ring f. Thus the one treadle when depressed first lifts the can-seat to produce
 40 an air-tight connection of the top opening of the can with the discharge-orifice and the air-exhaust opening, and, second, operates the pump-piston. The cut-off e is moved by a lever, I, pivoted at s, and a rod, t, connects
 45 the cut-off e with said lever. A friction-roller, u, is attached to a collar, u', fixed on the piston-rod i', and is in position to press against the lever I when the rod moves. Thus the roller u and lever I act as a cam and open
 50 the valve by moving the cut-off sidewise away from the discharge-orifice. This orifice is closed by the cut-off moving back, which movement in the present instance is made by the action of one or two springs, v, which connect
 55 the lever I and cut-off rod t with two rigid hangers, w.

Instead of springs v to move the cut-off back, the same may be effected by a cam arrangement like the roller u and lever I.

60 By the above-named arrangement a movement of the one treadle effects still another result—to wit, the opening and closing of the valve.

It is obvious that the can-seat may be lifted
 65 and the valve opened and closed by a treadle or other equivalent means separate from that

which works the air-pump, and my invention therefore is not restricted to the particular mechanism here shown.

If desired, the can-lifter, cut-off, and air-
 70 pump may each be operated by wholly independent mechanism without departing from my invention.

From the foregoing it will be seen that the air is first exhausted, or nearly exhausted,
 75 from the can, and then the vegetable or other material that is in the hopper will, when the valve opens, at once enter the empty can without causing any "splash" or squirting of liquid from the can, as is commonly the case
 80 with machines now in use. This serious objection to most machines now in use is here overcome by first exhausting air from the can, as herein described.

By the use of an air-exhauster combined as
 85 described a plunger or other force-feed device as heretofore used in filling-spouts may be dispensed with, because, as a partial vacuum has been created in the can, the vegetable or other material will readily enter by the opera-
 90 tion of atmospheric pressure on the surface of the contents in the hopper. An air-exhauster may, however, be used in combination with a hopper, filling-spout, and plunger, as indicated in Fig. 10, where the plunger is designated
 95 by the letter L.

Whether or not a plunger or other force-feed device be used, the disagreeable splashing or squirting is effectually avoided by first
 100 exhausting air from the can. My invention therefore is not restricted to the use or non-use of any kind of force-feed device.

Steam-power may be substituted for the foot-treadle in operating the machine.

Having described my invention, I claim and
 105 desire to secure by Letters Patent of the United States—

1. A can-filling machine having in combination a hopper with a discharge-orifice and an air-exhauster to withdraw air from the can, as
 110 set forth.

2. A can-filling machine having in combination a hopper with a discharge-orifice having an air-exhaust opening and an air-pump or equivalent exhauster connected with the said
 115 opening, as set forth.

3. A can-filling machine having in combination a hopper with a discharge-orifice, an air-exhaust opening, an elastic ring surrounding both said orifice and opening, and an air-ex-
 120 hauster connected with said opening, as set forth.

4. A can-filling machine having in combination a hopper with a discharge-orifice, a valve controlling said orifice, and an air-ex-
 125 hauster to withdraw air from the can, as set forth.

5. A can-filling machine having in combination a hopper with a discharge-orifice, an air-exhaust opening in proximity to said orifice, an air-exhauster, a pipe connected with the
 130 air-exhaust opening, attached to the hopper,

and provided with a coupling for connection with the air-exhauster, as set forth.

6. A can-filling machine having in combination a hopper with a discharge-opening, a valve controlling said opening, a vertically-lifting can-seat, and an air-exhauster to withdraw air from the can, as set forth.

7. A can-filling machine having in combination a hopper with a discharge-opening, a valve controlling said opening, an air-exhauster to withdraw air from the can, and a single treadle or equivalent means to operate the valve and air-exhauster, as set forth.

8. A can-filling machine having in combination a hopper with a discharge-opening, a vertically-lifting can-seat, an air-exhauster to withdraw air from the can, and a single treadle or equivalent means to operate the can-seat and air-exhauster, as set forth.

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

EDWARD S. JUDGE.

Witnesses:

JOHN E. MORRIS,
JOHN T. MADDUX.