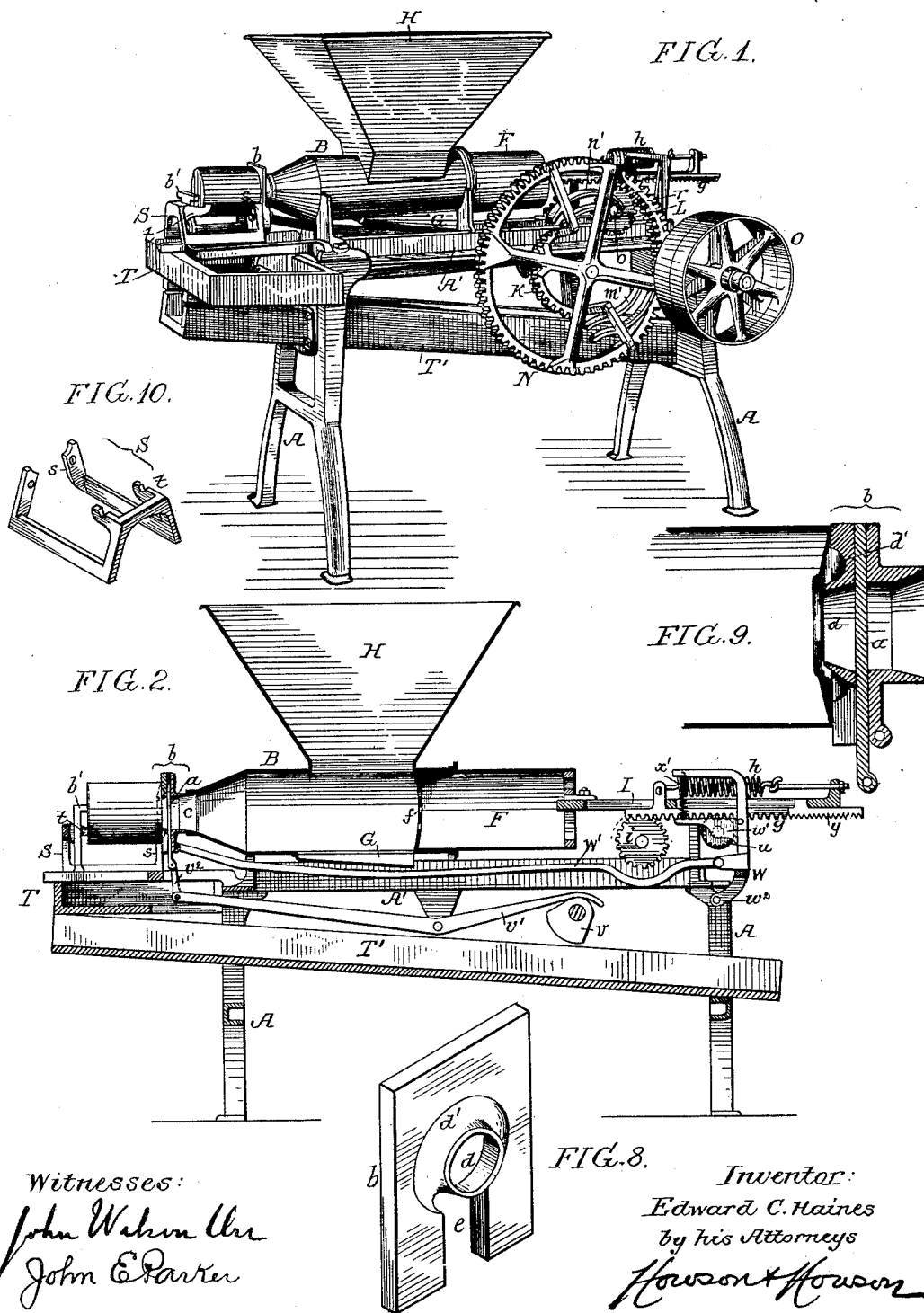


E. C. HAINES.
CAN FILLING MACHINE.

No. 435,745.

Patented Sept. 2, 1890.



(No Model.)

2 Sheets—Sheet 2.

E. C. HAINES.
CAN FILLING MACHINE.

No. 435,745.

Patented Sept. 2, 1890.

FIG. 3.

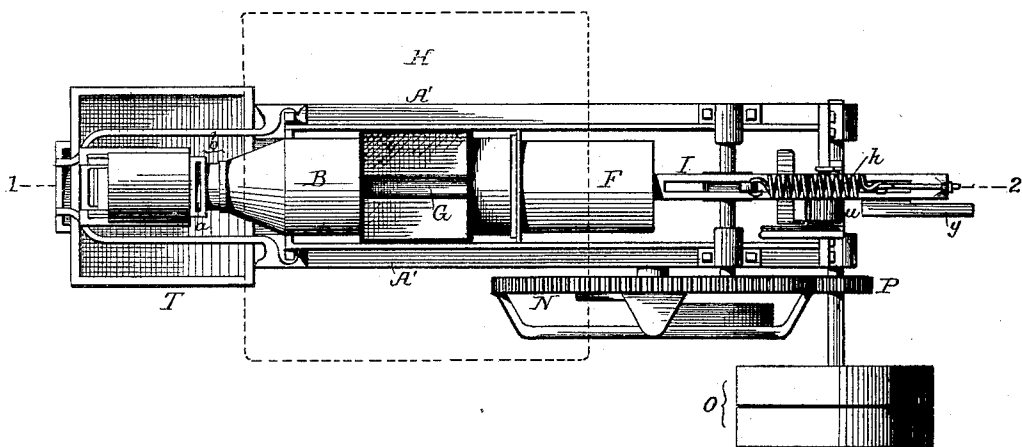


FIG. 5.

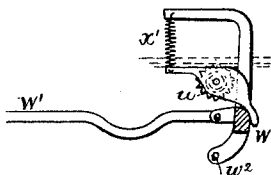


FIG. 6.

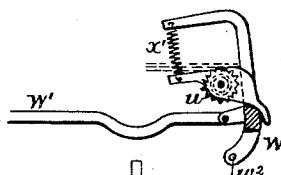


FIG. 7.

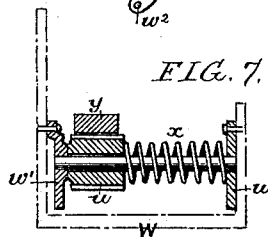
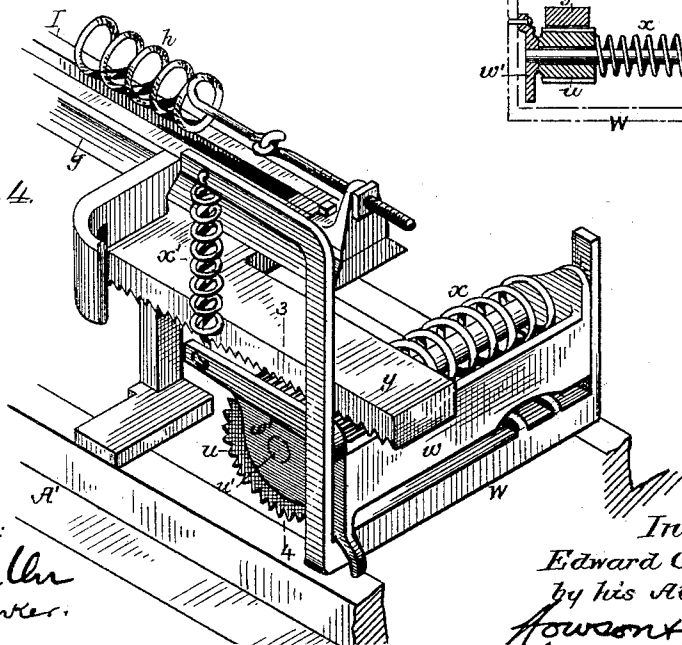


FIG. 4.



Witnesses:

John Wilson
John E. Parker.

Inventor:

Edward C. Haines
by his Attorneys
Howson & Howson

UNITED STATES PATENT OFFICE

EDWARD C. HAINES, OF WOODSTOWN, NEW JERSEY.

CAN-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 435,745, dated September 2, 1890.

Application filed March 29, 1889. Serial No. 305,218. (No model.)

To all whom it may concern:

Be it known that I, EDWARD C. HAINES, a citizen of the United States, and a resident of Woodstown, Salem county, New Jersey, have invented certain Improvements in Can-Filling Machines, of which the following is a specification.

My invention relates to that class of can-filling machines in which the fruits, vegetables, or similar substances are forced into the cans by means of a reciprocating plunger; and the invention comprises certain improvements in the construction of such a machine with the view of simplifying its construction and rendering it effective in operation.

In the accompanying drawings, Figure 1 is a perspective view of a machine constructed in accordance with my invention. Fig. 2 is a longitudinal section of the same on the line 1 2, Fig. 3. Fig. 3 is a plan view of the machine with the hopper partly in section. Fig. 4 is a perspective view of a portion of the machine. Figs. 5 and 6 are diagrams illustrating the action of that part of the machine shown in Fig. 4. Fig. 7 is a section on the line 3 4, Fig. 4. Figs. 8 and 9 are detached views of the filling-nozzle, and Fig. 10 is a perspective view of the can-holder.

The operating parts of the machine are supported upon a suitably-shaped frame consisting of legs A, connected by a top frame A'. On this frame A' is mounted a horizontal cylinder B, tapering at its forward end and provided with a movable nozzle b, through which the material is forced into the cans, said nozzle having a cut-off valve a. The nozzle is constructed with an elongated body c, adapted to slide within the contracted end of the cylinder, and is operated by devices hereinafter described in such a manner as to press tightly against the head of the can to be filled, the bottom of the can being seated against a fixed outer bearing or abutment b'. The outer face of the nozzle b is of the peculiar construction best shown in Figs. 8 and 9, having a slightly-projecting mouth d, surrounded by an annular recess d', the lower portion of the face-plate of the nozzle being cut away at e from this recess d' to the bottom of the face-plate, so as to permit the escape of air from the can when the latter is being filled, the air escaping from the mouth

of the can into the recess, and thence through the passage e, as shown in Fig. 9. The recess and opening also permit the escape of juice flowing from the mouth of the can during the filling operation.

The cylinder B is provided with a hopper H, and has formed in its lower portion a groove G, inclining from the forward end to the rear end of the cylinder in such manner as to carry off the juices from the material with which the cans are being filled, the groove being of contracted width, as shown in Fig. 3, so as to prevent the escape of the solid matters through the same.

The plunger F is guided and slides within the cylinder B, and has formed in its slightly-concaved front face a series of perforations f, through which a portion of the juice may escape into the hollow plunger so as to be discharged from its rear end. These openings also permit the passage of air to the front end of the plunger during the retraction of the same and thus prevent the formation of a partial vacuum at that point, which would interfere with such retraction of the plunger.

The means for effecting the reciprocating motion of the plunger consists of a rack g, connected through the medium of a coiled spring h to an arm I, projecting from the rear of the plunger, the rack engaging with the teeth of a pinion i, moved alternately in opposite directions, so as to impart a forward and backward reciprocating movement to the plunger, the object of the spring-connection h being to impart a yielding forward movement to the plunger, and thus prevent the fruit or vegetables from being packed in the cans at more than a previously-determined pressure, which it might be if the plunger-operating devices were rigid, as the quantity of fruit in the cylinder and hopper frequently varies.

To effect the alternating rotative movement of the pinion i, I employ two segmental racks K L, suitably secured to an operating-wheel N and at different distances from the center of said wheel N, the latter being operated directly by power or hand or (if it is desired to employ higher speed for the primary shaft) through the medium of driving-wheels O and pinion P, the latter engaging with teeth formed on the periphery of the operating-

wheel N. The racks K L engage alternately with a pinion r on opposite sides of the axis of the same, said pinion being secured to the same shaft as the pinion i , so that a continuous rotation in one direction of the wheel N will cause a rotation of the pinion r , and consequently of the pinion i , first in one direction and then in the other.

On the inner face of the wheel N are cams $m' n'$, engaging with a crank-pin o , projecting from the face of the pinion r in such manner as to partially rotate the said pinion, the cam m' acting on the crank-pin of the pinion after the rack K has ceased to turn the same and before the rack L engages with it and serving to turn the pinion in the same direction as it will be turned by said rack L, while the cam n' acts between the operations of the racks L and K to impart a movement to the pinion preliminary to its movement by said rack K. The extent of movement imparted by each cam is such as to cause a tooth of the pinion to be presented properly to the end of each rack by the time the latter reaches its operative position, so that all danger of breaking or jamming of the teeth is obviated and the machine operates properly without regard to the speed at which the wheel N is driven. The can-carrier S is bolted to the sliding nozzle b and has front and rear can-supports s and t formed, as shown in Fig. 10, so as to support the can close to the top and bottom, leaving the intermediate portion of the can entirely free, so that while the can is securely and accurately held in position the operator can readily grasp it in one hand, and hence can operate the machine more rapidly and remove the cans or place them in position more readily than in machines of this class as heretofore constructed. Owing to the four-point bearing provided by the front and rear supports, moreover, the can will seat itself firmly on said supports, irrespective of slight irregularities in the size or shape of different cans.

To effect a tight joint between the head of the can and the nozzle during the operation of filling, I employ the following mechanism, reference being had more especially to Figs. 2, 4, 5, 6, and 7: A pinion u with V-shaped teeth is carried by a shaft u' , suitably mounted in a small frame w , and is firmly held against a plate w' at one side of the frame by means of a coiled spring x coiled around its shaft and bearing at one end against the pinion and at the other end against a bearing on the frame w . Said frame w is pivoted to a frame W, hung to the fixed frame of the machine, and the two frames w and W are connected together by a coiled spring x' , which tends to elevate the frame w and pinion u .

The main operating-rack g has projecting from its rear end a small rack y , operating in connection with the pinion u in the following manner: When the rack g is approaching the limit of its forward movement, the rack y comes in contact with the pinion u ; but as

said pinion is held in intimate frictional contact with the plate w' of the frame w by the action of the spring x the forward movement of the rack, instead of turning the pinion, tends to move the frames w and W forward upon the pivot of said frame W, swinging upon its pivot w^2 , the spring x' serving to hold the pinion u in contact with the teeth of the rack y . In some cases, however, the shaft carrying the pinion u may be adapted to bearings in rigid arms on the frame W instead of being carried by the swinging frame w . The forward movement of the frame W is transmitted through a connecting-rod W' to the sliding nozzle b , thereby pushing the same forward into contact with the head of the can, so as to form a close joint therewith, the bottom of the can bearing against the abutment b' . After the forward movement of the nozzle is arrested by the can the rack y , continuing its forward movement, rotates the pinion u , while at the same time keeping it in the forward position to which it was first moved by the action of the rack, so that the nozzle is kept in contact with the face of the can during the entire filling operation. The return movement of the rack will first operate to push the frame W back to its normal position, so as to at once move the nozzle from the can after the filling operation is completed, thus permitting the operator to remove the can without waiting until the plunger is entirely retracted.

On the main shaft of the operating-wheel N is fixed a cam v , operating on a lever v' , fulcrumed on the fixed frame of the machine, the forward end of the lever being connected by a link v^2 to the sliding valve a in the nozzle, this valve being operated at the proper time with respect to the movement of the plunger B and in such manner that the passage through the nozzle b will be opened when the plunger is advanced and closed when said plunger is retracted.

A suitable tray T and trough T' serve to convey from the machine the juice escaping therefrom, so as to prevent unnecessary waste and annoyance from splashing.

I am aware that can-filling machines have heretofore been provided with nozzles having passages for the discharge of air and juice from the cans; but in no prior machine, so far as I am aware, is there any such provision for the free and unobstructed escape of the air and juice as in my machine afforded by the annular groove or depression in the nozzle-plate and the passage leading directly downward from such groove.

I claim as my invention—

1. In a machine for filling cans, the combination of the cylinder, a plunger in said cylinder, a rack connected to the plunger through the medium of a spring, a pinion for engaging with said rack, and means for rotating the pinion first in one direction and then in the other, substantially as specified.

2. The combination, in a can-filling ma-

chine, of the cylinder, a reciprocating plunger therein, a sliding nozzle, a pivoted frame connected to said nozzle, a pinion carried by said pivoted frame and having a frictional bearing thereon, and a reciprocating rack engaging with said pinion, substantially as specified.

3. The combination, in a can-filling machine, of the cylinder, a reciprocating plunger therein, a sliding nozzle, a rack connected to the plunger, a reciprocating pinion engaging with said rack, a supplementary rack, a rocking frame connected to the sliding nozzle, and a pinion carried by said frame and engaging with the supplementary rack, substantially as specified.

4. The combination of the cylinder, its sliding nozzle, a pivoted frame connected thereto, a supplementary frame hung to the said pivoted frame and having a spring-connection therewith, a shaft carried by said supplementary frame and having a pinion bearing against the same, and a reciprocated rack for operating said pinion, substantially as specified.

5. The combination, in a can-filling machine, of a cylinder, a can-rest, a filling-nozzle forming a close joint with the top of the can, and a plunger reciprocated in the cylinder and having a perforated pressing-face, substantially as specified.

6. The combination, in a can-filling machine, of the horizontal cylinder with reciprocated plunger therein, and a vertical nozzle-plate having a central projecting mouth for directing a charge into the mouth of the can, an outer portion of the nozzle-plate forming a bearing for the rim of the can-head, said nozzle-plate having between said outer bearing and the projecting mouth an open annular groove with discharge-passage leading downward therefrom, substantially as specified.

7. The combination, in a can-filling ma-

chine, of the horizontal cylinder, the reciprocated plunger therein, and a horizontal can-holder supporting the can at points adjacent to its opposite ends, but free from contact with the can between said opposite ends, whereby the body of the can can be grasped in one hand by the operator, substantially as specified.

8. The combination, in a can-filling machine, of the cylinder, the plunger, a rack connected thereto, a shaft having a pinion engaging with said rack, an operating-wheel, inner and outer segmental racks carried thereby, and a second pinion on the same shaft as the first, said second pinion engaging alternately with the segmental racks, substantially as specified.

9. The combination, in a can-filling machine, of the cylinder, the plunger, a rack connected thereto, a shaft having a pinion engaging with said rack, an operating-wheel carrying inner and outer segmental racks engaging alternately with another pinion on said shaft, and cams carried by said operating-wheel and engaging with a crank-pin on said pinion for the purpose of operating the same in the intervals between the engagements of the racks therewith, substantially as specified.

10. The combination, in a can-filling machine, of the main drip-tray T', extending under the machine, and a supplemental drip-tray T, situated under and beyond the filling-nozzle and under the can-holder, said supplemental tray communicating with the main drip-tray, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD C. HAINES.

Witnesses:

WILLIAM D. CONNER,
HARRY SMITH.