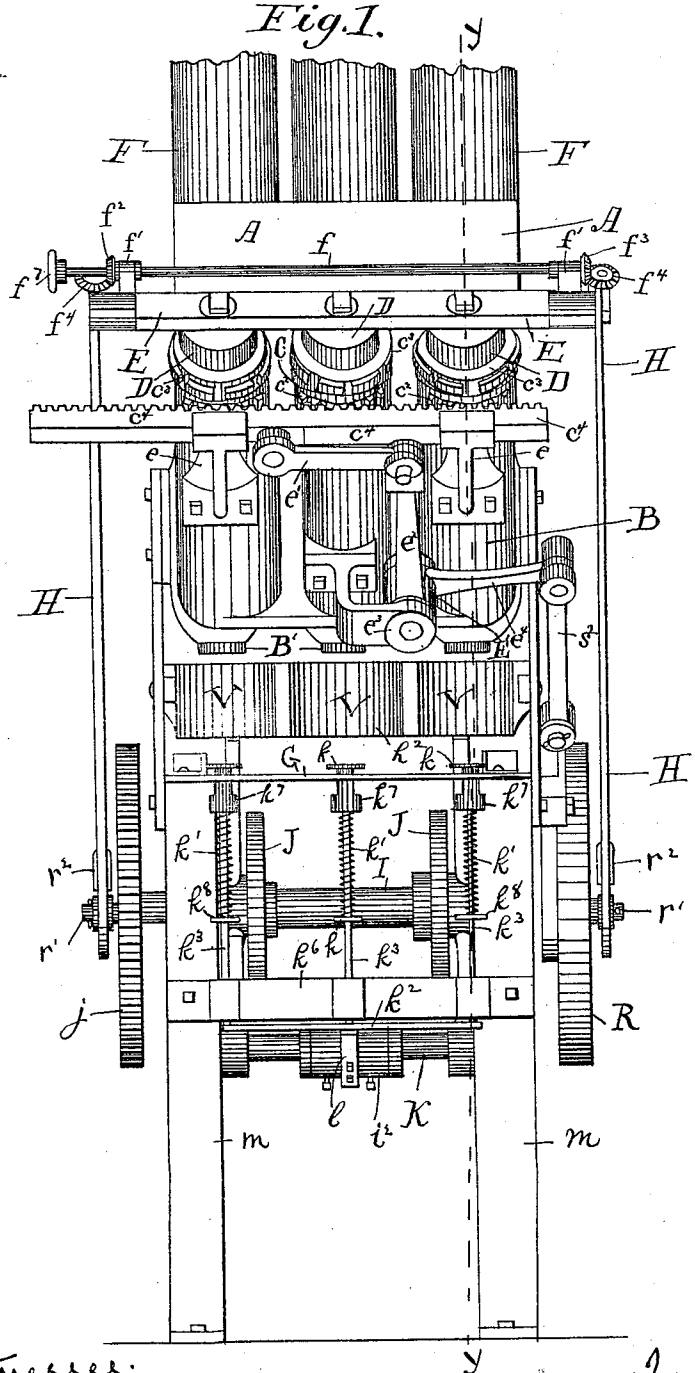
(No Model.) 3 Sheets—Sheet 1.

H. R. STICKNEY.

CAN FILLING MACHINE.

No. 515,062. Patented Feb. 20, 1894.

Fig. 1.



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H. G. Palmer

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Fig. 2.

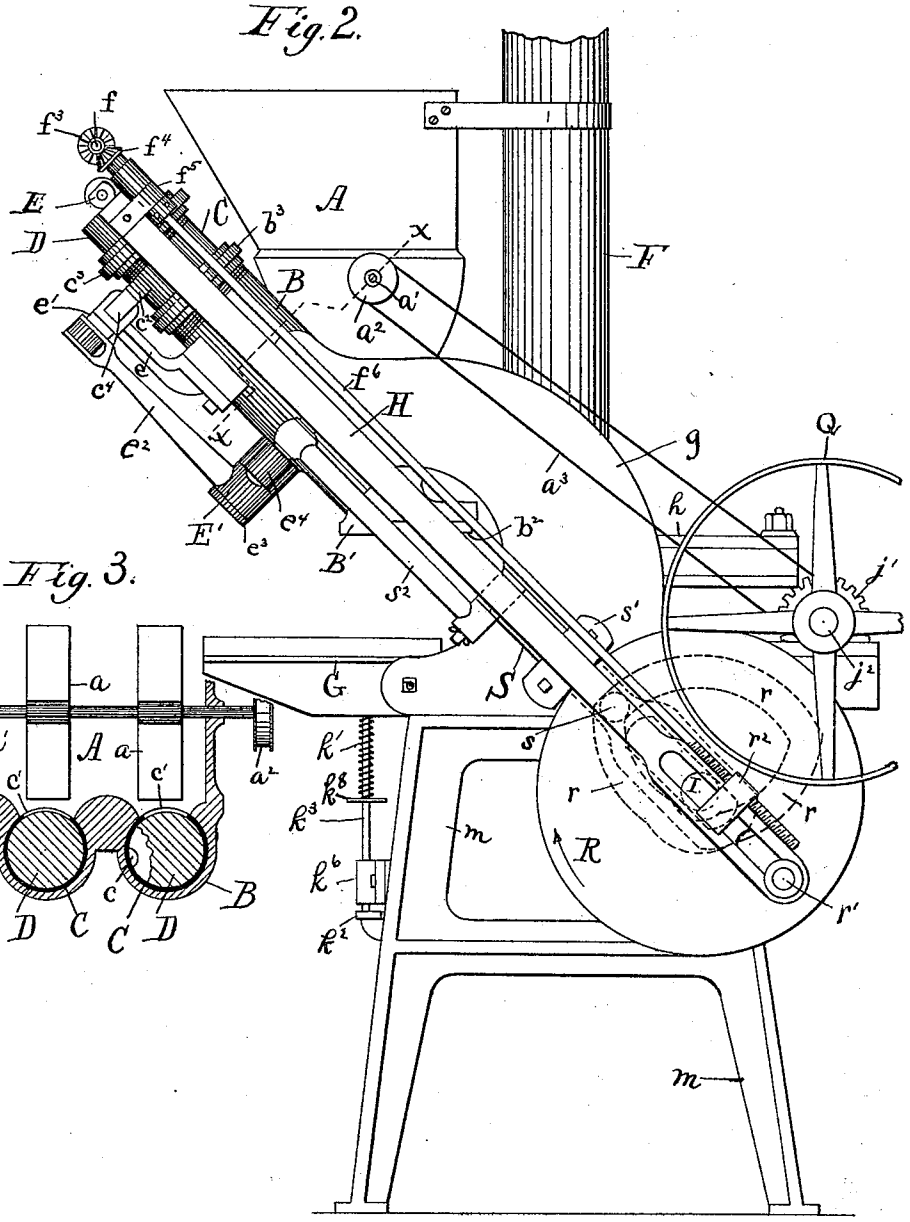

Fig. 3.

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(No Model.) 3 Sheets—Sheet 3.

H. R. STICKNEY.

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Fig. 4.

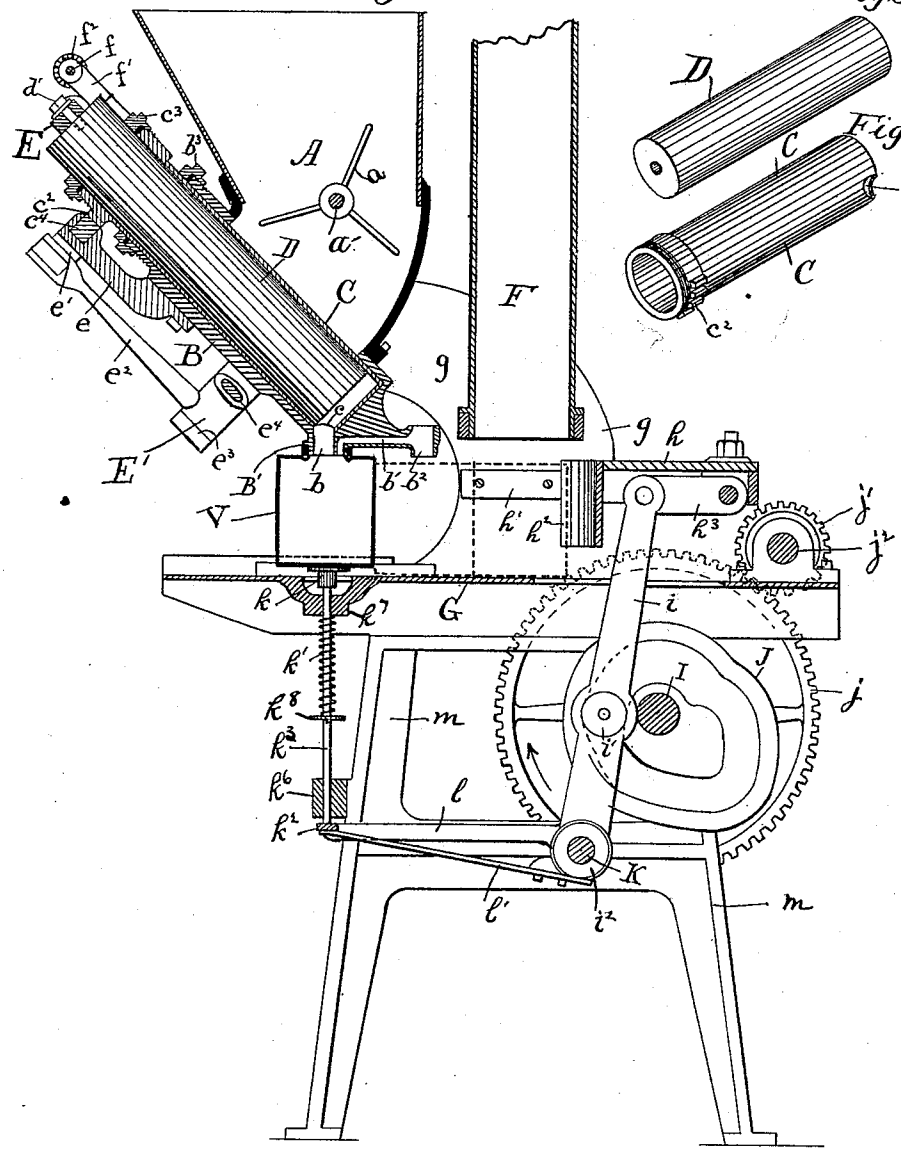

Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE.

HENRY R. STICKNEY, OF PORTLAND, MAINE.

CAN-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 515,062, dated February 20, 1894.

Application filed December 21, 1893. Serial No. 494,290. (No model.)

To all whom it may concern:

Be it known that I, HENRY R. STICKNEY, 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 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.

My invention relates to can filling machines and the object of the invention is to simplify the construction of this class of machines, to so arrange the parts that several cans may be filled at the same time and to make the filling nozzle as short as possible so that when the charge is cut off there will remain but a small quantity of material to run out of the filling nozzle onto the tops of the cans as they are fed under.

In the accompanying drawings I have illustrated a three cylinder can filling machine constructed according to my invention.

In the drawings Figure 1 is a rear view of the machine. Fig. 2 is a side view. Fig. 3 is a section on the line $x\ x$ of Fig. 2. Fig. 4 is a section on the line $y\ y$ of Fig. 1. Fig. 5 is a detail of the plunger and Fig. 6 is a detail of the charging cylinder.

The machine is supported on a suitable framework $m\ m$.

G represents the bed of the machine and A is the filling hopper which is held in place by the supports $g\ g$. The hopper is provided with the usual agitator a rotating on the shaft a' which has on its outer end the pulley a^2 by which it is rotated, the said pulley being connected by means of the belt a^3 with the driving shaft j^2. Below the hopper, as herein shown, is a casing B in which is journaled the charging cylinder C placed preferably in an inclined position and I have here shown three of these cylinders placed side by side, although it is evident that any number may be used in one machine. The upper end of each cylinder C projects out of the casing and a tight joint is made by means of a packing gland b^3. The lower end of the cylinder I prefer to make solid as here shown with an outlet port c cut out of the lower edge in such a position with relation to the inlet port c', which is formed in the side of the cylinder, that each will be closed or cut off when the other is open. (See Fig. 3.) The ports are cut off and opened by the rotation of the cylinder C which is preferably operated by means of a gear c^3 formed on the upper end of the cylinder, said gear on the several cylinders engaging a reciprocating rack c^4 held in guides e.

Working within the cylinder is a plunger D, a tight joint being made with the upper end of the cylinder by a packing gland c^3.

Motion is applied to the cylinder as follows, viz: On the main driving shaft j^2 is the driving pulley Q and the pinion j' which engages the gear j on one end of the shaft I. On the other end of the shaft I is the cam R having on its inner surface a cam path r in which plays the cam roll s pivoted to the sliding bar S, the lower end of which is formed with a slot or opening fitting over the shaft I. (See dotted lines Fig. 2.) As the cam turns, the sliding bar is forced up or down or remains at rest according to the form of the cam path which, as herein shown, has two concentric portions united by two inclined portions. The sliding bar S is held in the guide s' and to its upper end is pivoted a link s^2 which is in turn pivoted to the horizontal arm e^4 of an elbow lever E'. This lever is journaled to a bearing e^3 and its vertical arm e^2 is pivoted to one end of the link e', the opposite end of which is pivoted to the rack c^4 already described. The form of the cam R is such that as it rotates the sliding bar is moved up and down, forcing the rack backward and forward or holding it fixed, according to the movements of the charging cylinder, to be hereinafter described. The three plungers D are operated by a pitman rod H on each side of the machine, the upper end of each rod being pivoted to one end of the cross bar E which extends across and is connected with the upper ends of the plungers. The lower end of each pitman rod H has a longitudinal slot, in the lower end of which slot plays the crank pin r'. On one side of the machine the crank pin is fixed to the outer surface of the cam R and on the opposite side of the machine the crank pin is fixed to the gear j. The crank pin has a limited amount of play in the slot, the amount being determined by

the position of the bearing block r^2 which is adapted to slide in the slot. The position of the block r^2 determines the distance the plungers are lifted or withdrawn in the cylinders and consequently the amount of material admitted into the charging cylinders at each stroke.

The position of the block r^2 is regulated by means of a screw threaded shaft f^6 which is journaled in bearing f^5 at the side of the pitman rod, its lower end being in engagement with a nut or a screw threaded aperture in the block r^2. Means are provided for turning the shaft f^6. As herein shown I secure on the upper end of each of the shafts f^6 a miter gear f^4 which engages another miter gear f^3 at one end of the machine, and f^2 at the other, the two last named gears being secured to the opposite ends of the shaft f journaled in bearings f' and extending parallel to and above the cross bar E. This shaft is provided with a hand wheel f^7 by which it is turned and the motion is transmitted to the shaft f^6 through the miter gears. It will thus be seen that the turning of the hand wheel f^7 screws the block r^2 up or down and regulates the lift of the plunger.

The filling nozzle b opens through the lower side of the casing B and connects with the lower edge of the cylinder C, the outlet port c registering with the opening in the filling nozzle when it is turned to the open position. From one side of the filling nozzle there is a channel b' for the escape of the overflow, leading toward the can reservoir F, and ending in a discharge opening b^2 directly over the stud hole of the incoming can next to the one being filled.

Mechanism is provided for intermittently feeding three cans at a time under the three filling nozzles. Opposite each filling nozzle is a can reservoir F and underneath the lower end of each reservoir is a reciprocating carriage h for pushing the can toward the filling nozzle. When the carriage h is in its forward position the cans in the several reservoirs rest on its upper surface and when it moves back it permits the cans to fall down onto the bed of the machine so that they may be pushed forward by the concave surfaces h^2 of the carriage. The carriage h slides back and forth on guides h' and it is reciprocated by two levers $i\ i$ to the upper ends of which it is connected by links h^3. The lower end of each lever i is pivoted to a shaft K and to the lever is pivoted a cam roll i' which moves in the path of a cam J. The form of the cam J is such that the motion hereinafter described is imparted to the carriage h. As the cans are fed forward beneath the filling nozzle they are lifted by the action of the rest k which is seated in the bed of the machine directly beneath the filling nozzle, said rest being secured to the upper end of a spindle k^3 which is held in an upper guide k^7 and a lower guide k^6. A spiral spring k' forces the spindle k^3 downward and retains the rest k in its seat. The upper end of the spring k' presses against the guide k^7 and the lower end presses against a stop k^8. The three spindles are lifted at the proper time by a bar k^2 which extends across beneath their lower ends. The bar k^2 is secured to the outer ends of two arms l the inner ends of which are pivoted loosely to the shaft K. The arms l are each lifted by means of a straight spring l' secured to a hub i^2 on the lower end of the lever i. When the lever i moves back after feeding forward a can to the filling nozzle, the spring l' rises and lifts the spindles and the rests thus raising each can against the under surface of the nozzle. The spring l' prevents the movement of the can against the nozzle from being positive and if there is a little variation in the heights of the cans the spring compensates for the difference.

The operation of my filling machine is as follows, viz: When the plunger is withdrawn, the port c' of the charging cylinder is turned to connect with the hopper and the vacuum caused by the withdrawal of the plunger causes the cylinder to fill with corn or whatever material is being worked. While the plunger is being withdrawn the carriage h moves forward, pushing the can which has just been filled, away from the nozzle and placing a new can in position: as it moves back three new cans drop down in front of it from their reservoirs and the springs l' then lift each new can against its nozzle forming a tight joint around the stud hole. During this operation the outlet port is closed. The cylinder C being full, the sliding bar S is forced up by the cam R, and the rack moved across the machine turning each cylinder by means of its gear so that the inlet port is closed and the outlet port c is opened into the nozzle b. The plunger now descends and forces the contents of the cylinder into the can. If any surplus material is forced into the can it overflows into the next empty can through the channel b'. The rest k now drops, the carriage h moves forward, pushing a new can into place and the cylinder revolves back to its first position with the inlet port open and the outlet port closed. It will be observed that by having the cylinders inclined and connecting each filling nozzle with the edge of the cylinder, I am enabled to use a short nozzle and consequently after the outlet port closes there will be very little material left in the nozzle to drip on the tops of the incoming cans as they move under the nozzle.

I claim—

1. In a can filling machine the combination of a filling hopper, a charging cylinder journaled adjacent thereto, said cylinder having in the side thereof an inlet port connected with said hopper and having an outlet port at the end thereof, a plunger working within said cylinder and means for rotating said cylinder for opening and closing said outlet and inlet ports.

2. In a can filling machine the combination of a filling hopper, a charging cylinder journaled adjacent thereto, said cylinder having in the side thereof an inlet port connecting with said hopper and having an outlet port at its end, a gear on said cylinder and a reciprocating rack engaging said gear for rotating said cylinder and a plunger working in said cylinder.

3. In a can filling machine the combination of a filling hopper, a charging cylinder journaled in an inclined position beneath said hopper, said cylinder having an inlet port in the side thereof and an outlet port in its lower edge, a plunger working in said cylinder and means for rotating said cylinder for opening and closing said ports.

4. In a can filling machine the combination of a filling hopper, a charging cylinder connected with said hopper, a plunger working within said charging cylinder, a pitman rod pivotally connected with said plunger for operating the same, the end of said pitman rod being provided with a longitudinal slot, a bearing block adapted to slide longitudinally in said slot, a crank and pin for operating said pitman rod, said pin acting in said slot between said block and the end of the rod a shaft journaled at the side of said pitman rod, the lower end of said shaft having a screw thread which engages a like thread in said block and means for rotating said shaft and shifting the position of said block whereby the lift of the plunger may be regulated.

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

HENRY R. STICKNEY.

Witnesses:
E. DUDLEY FREEMAN,
S. W. BATES.