(No Model.)

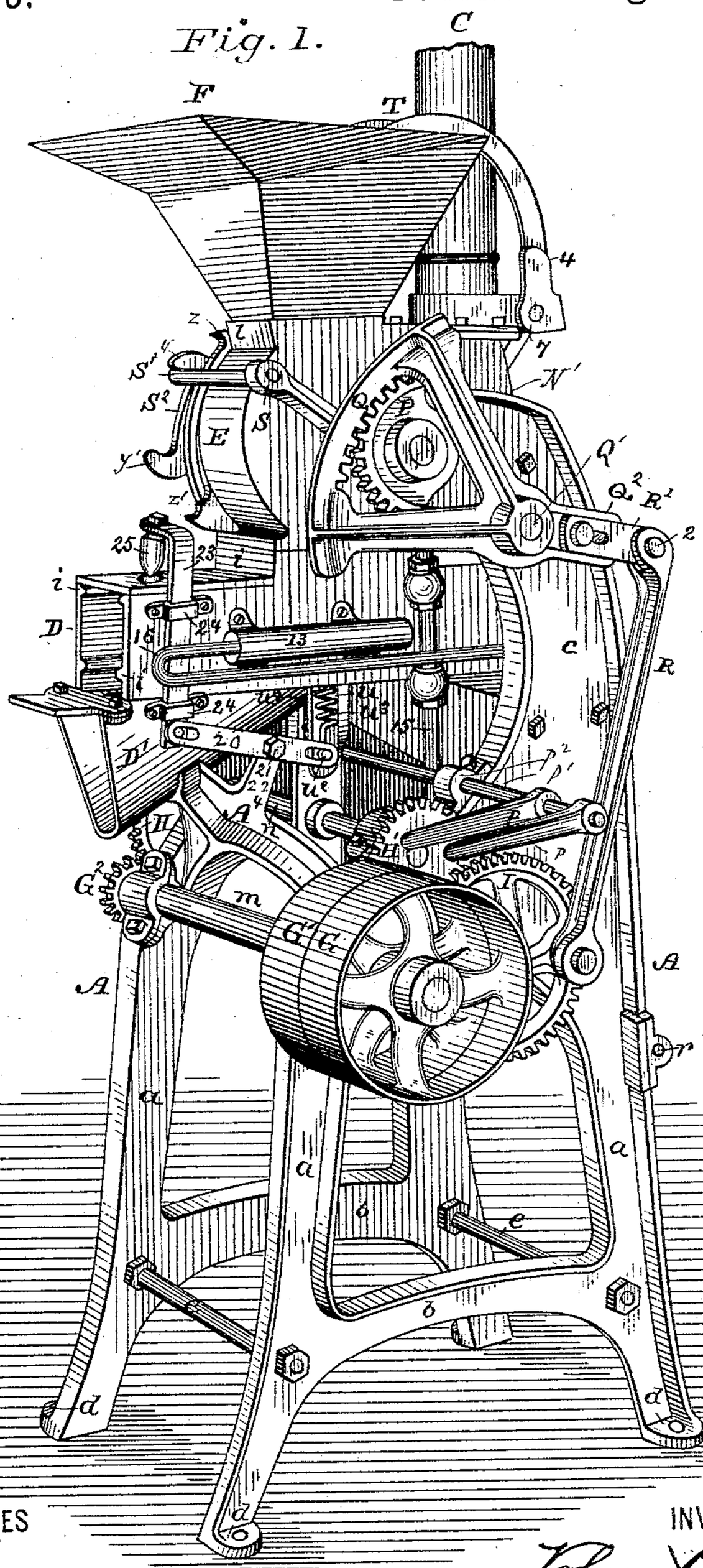
6 Sheets—Sheet 1.

V. BARKER.

CAN FILLING MACHINE.

No. 304,063. Patented Aug. 26, 1884.

Fig. 1.



WITNESSES

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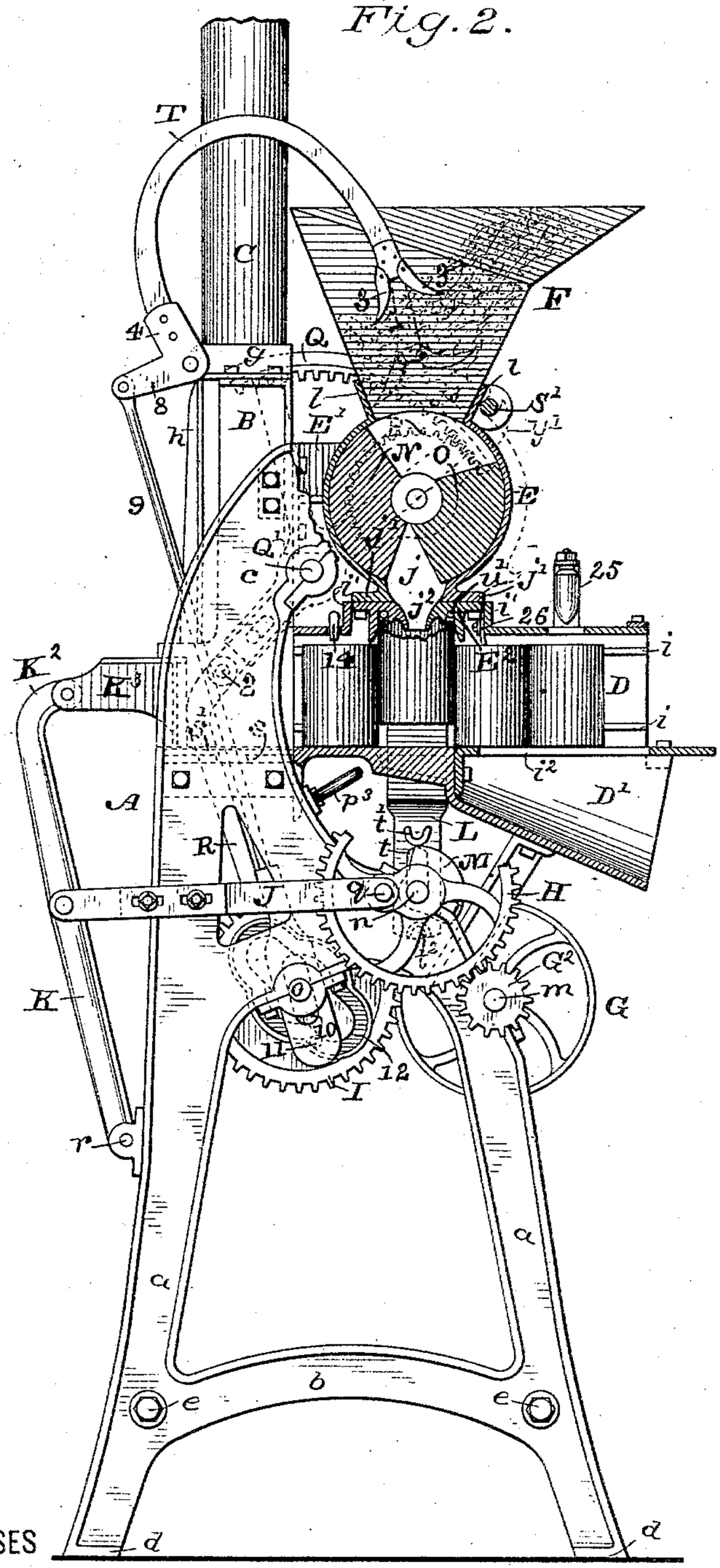
(No Model.) 6 Sheets—Sheet 2.

V. BARKER.

CAN FILLING MACHINE.

No. 304,063. Patented Aug. 26, 1884.

Fig. 2.



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(No Model.) 6 Sheets—Sheet 3.

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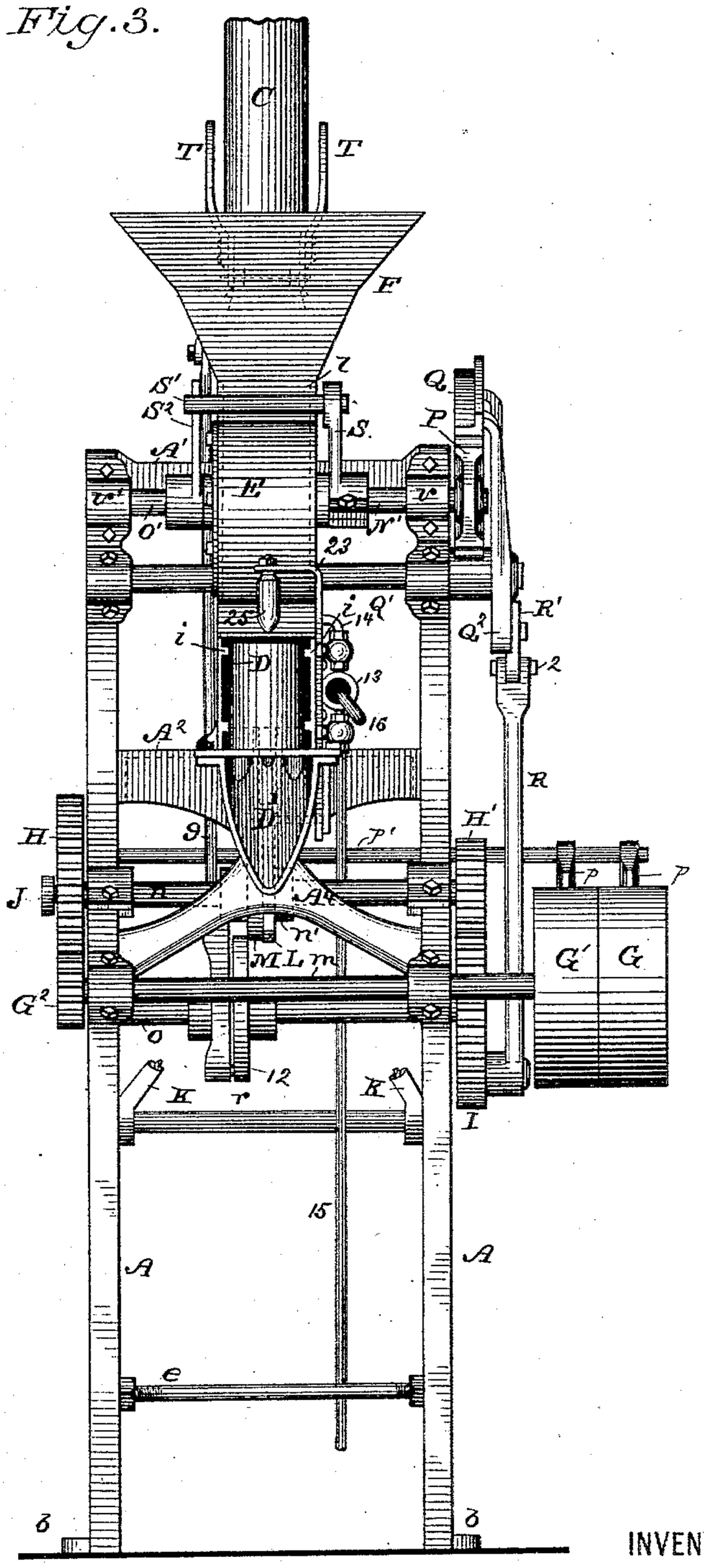
CAN FILLING MACHINE.

No. 304,063. Patented Aug. 26, 1884.

Fig. 3.



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(No Model.)

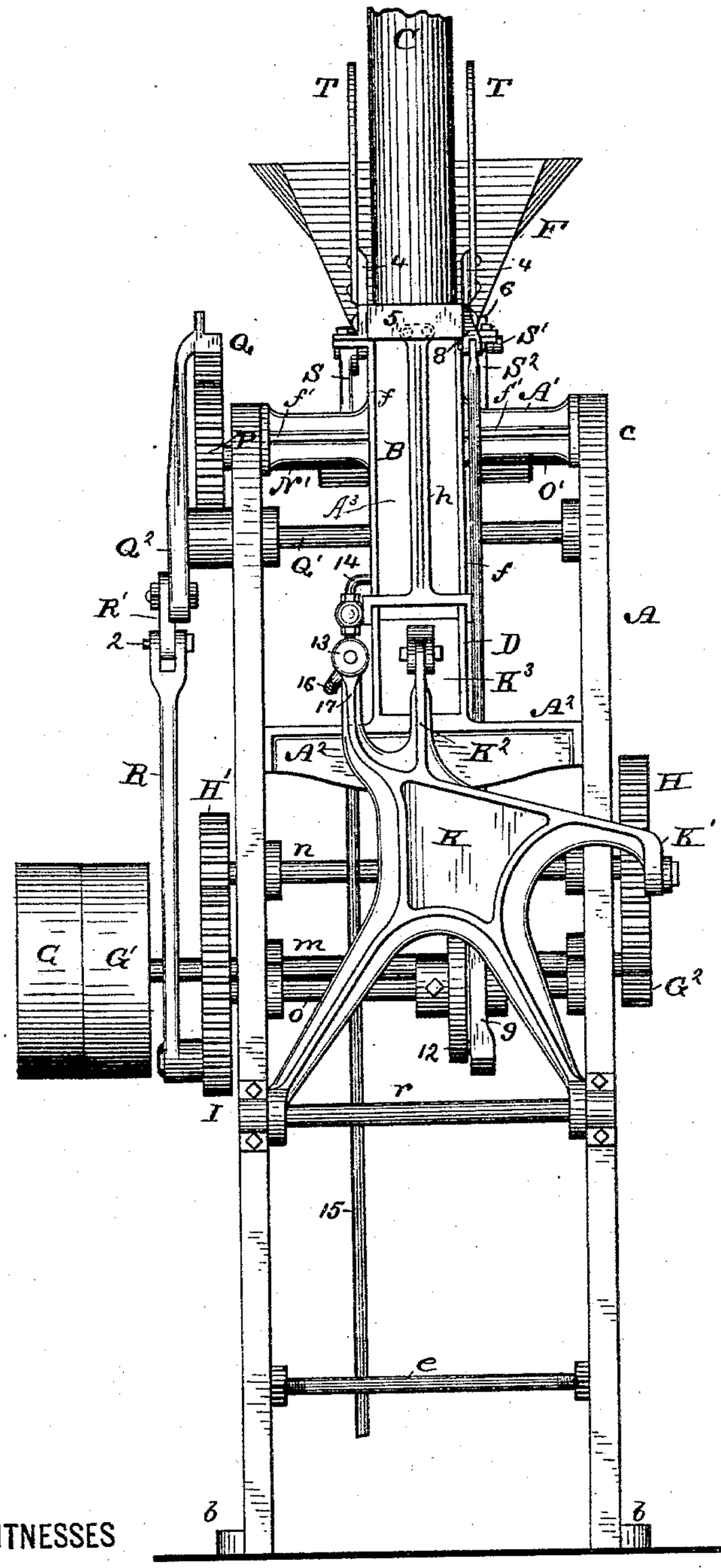
6 Sheets—Sheet 4.

V. BARKER.

CAN FILLING MACHINE.

No. 304,063. Patented Aug. 26, 1884.

Fig. 4.



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(No Model.) 6 Sheets—Sheet 5.

V. BARKER.

CAN FILLING MACHINE.

No. 304,063. Patented Aug. 26, 1884.

Fig. 5.

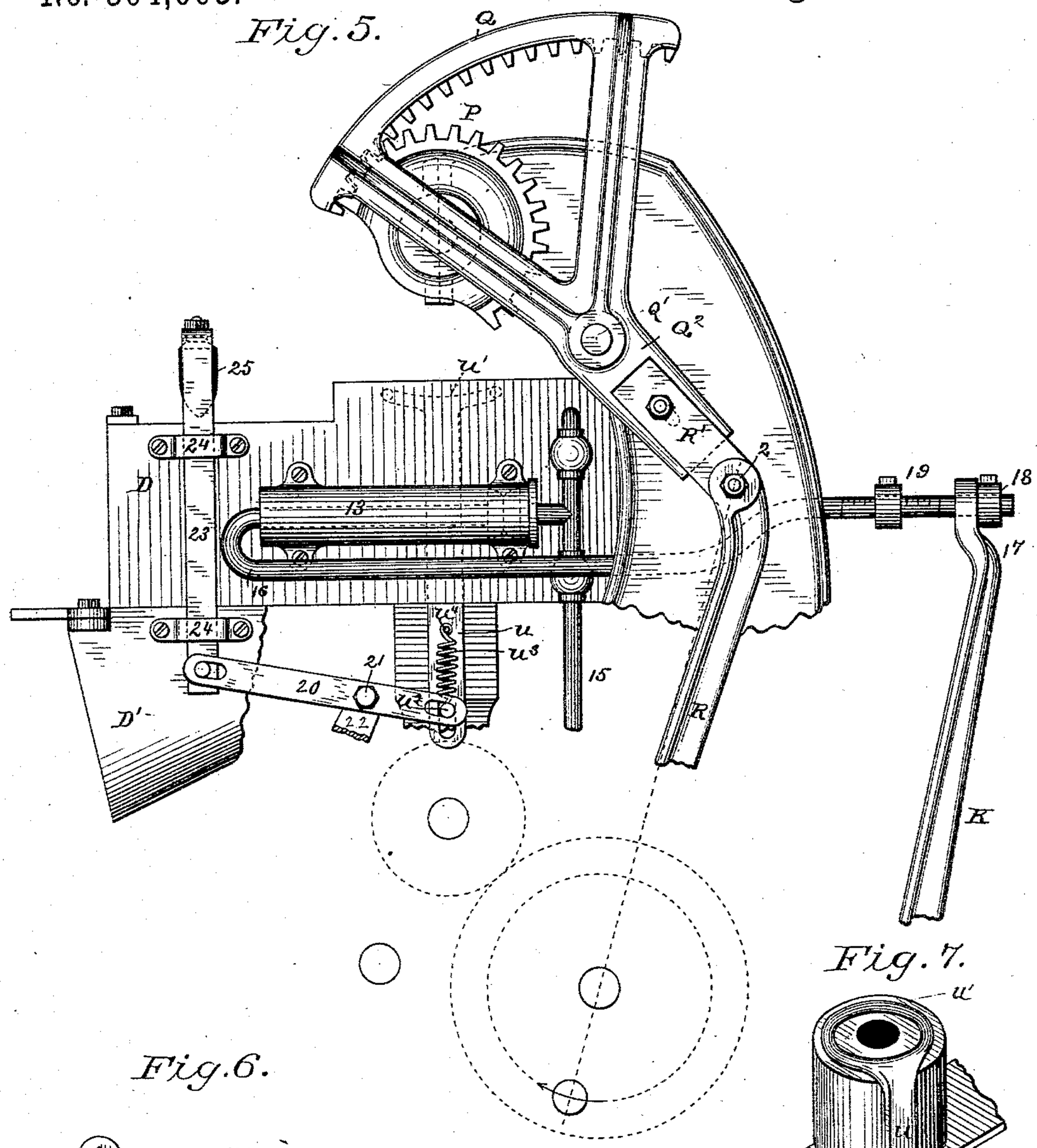


Fig. 6.

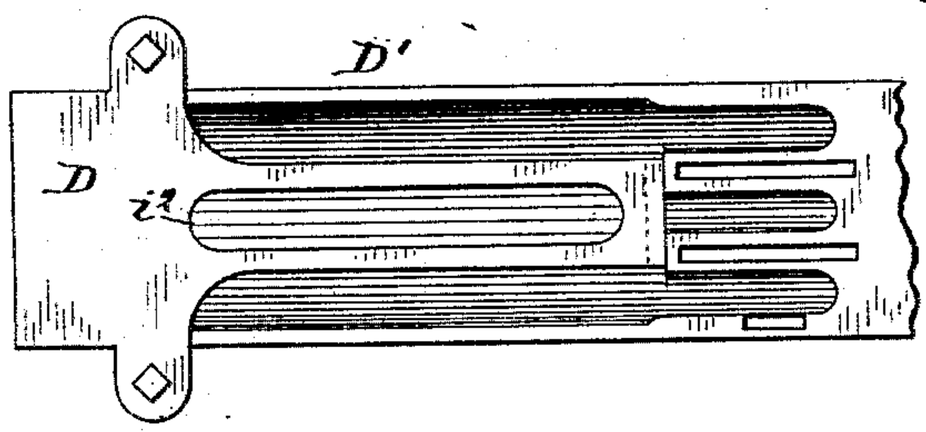
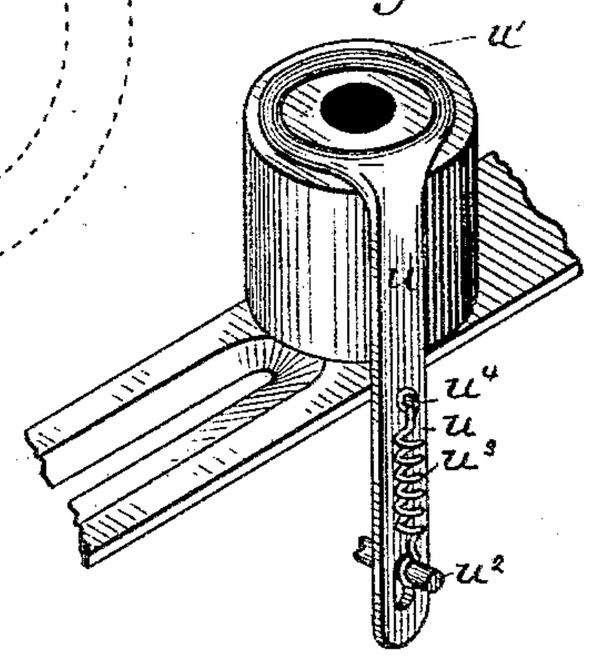


Fig. 7.



WITNESSES

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(No Model.) 6 Sheets—Sheet 6.

V. BARKER.

CAN FILLING MACHINE.

No. 304,063. Patented Aug. 26, 1884.

Fig. 8.

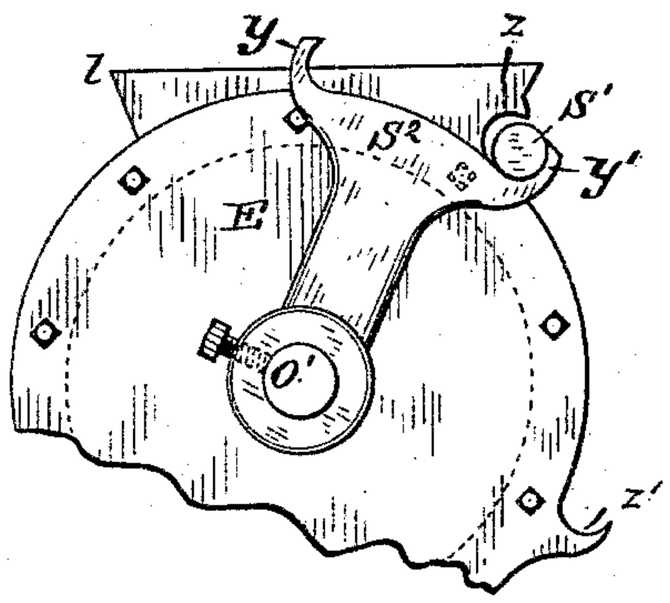


Fig. 9

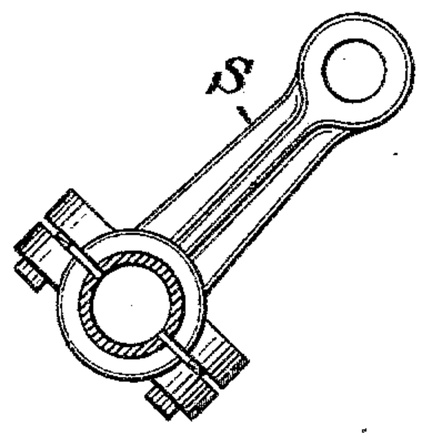
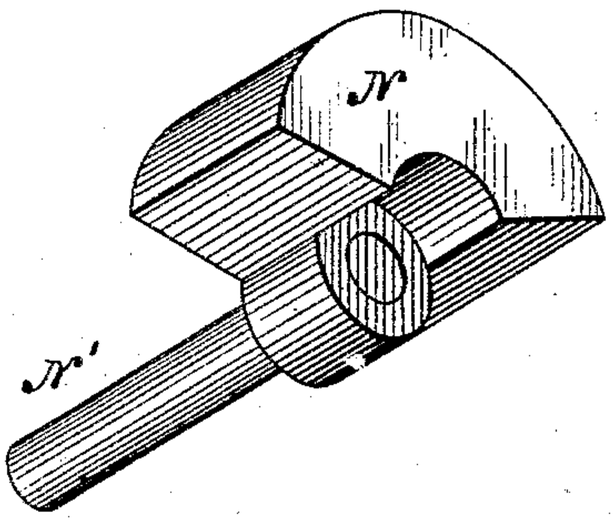


Fig. 10.

Fig. 11.



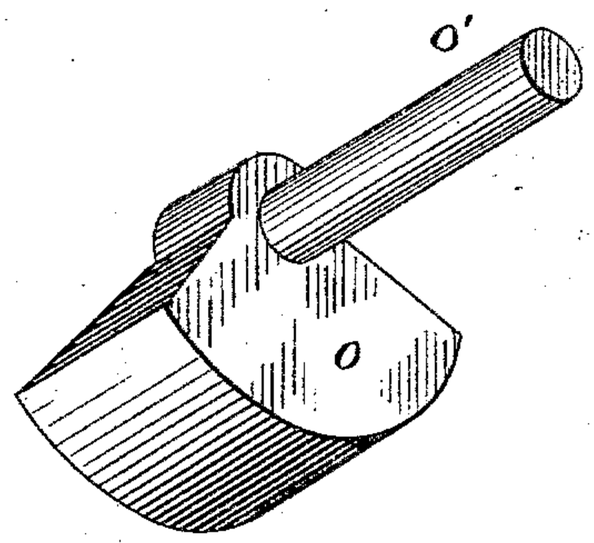
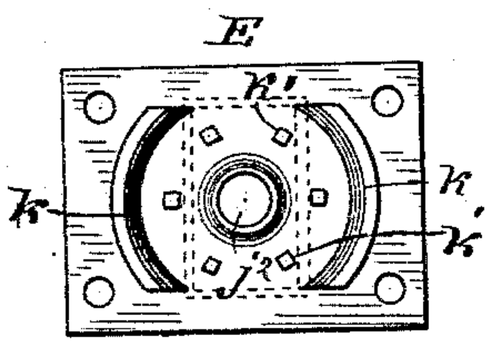
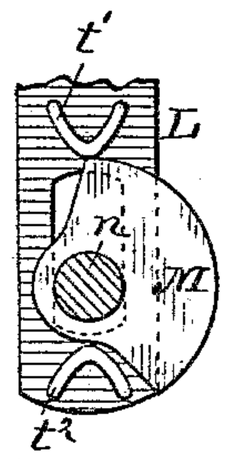


Fig. 12.

Fig. 13.





WITNESSES

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UNITED STATES PATENT OFFICE.

VOLNEY BARKER, OF PORTLAND, MAINE.

CAN-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 304,063, dated August 26, 1884.

Application filed May 29, 1884. (No model.)

To all whom it may concern:

Be it known that I, VOLNEY BARKER, 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, of which the following is a specification sufficiently full, clear, and exact to enable any person skilled in the art to which the invention appertains to make and use the same, reference being had to the accompanying drawings, forming a part thereof.

This invention relates to machines used in the art of canning animal or vegetable food for preservation.

The object of the invention is to provide a can-filling machine that is adapted to be run by power with greater rapidity and smoothness than machines heretofore in use for this purpose, that will measure the quantity of green corn or other material filled into each can with greater exactness, that is capable of exact adjustment to any desired quantity, and that will handle the cans with more precision and certainty.

Figure 1 of the accompanying drawings is a perspective view of this improved can-filling machine. Fig. 2 is a side elevation, partly in section, of said machine. Fig. 3 is a front elevation of this machine. Fig. 4 is a rear elevation thereof. Fig. 5 is an enlarged detail view of the mechanism for actuating the plunger, the pump, the can-lifter, and the device for pressing down the corn in the can. Fig. 6 is an enlarged plan view of the front end of the horizontal can-channel. Fig. 7 is a perspective view of a can with the clamping device applied thereto. Fig. 8 is an end view of the filling-cylinder, showing the arm by which the follower is operated. Fig. 9 shows an arm provided with a friction-clamp, which grasps the shaft of the plunger by which it is operated to actuate the follower. Fig. 10 is a perspective view of the plunger. Fig. 11 is a perspective view of the follower. Fig. 12 is a view of the under side of the nozzle-plate of the filling-cylinder. Fig. 13 is a view of the can in connection with the lower end of the can-lifter for lifting the can to be filled into contact with the nozzle of the filling-cylinder.

Similar letters of reference indicate corresponding parts of the different figures.

This machine embraces a filling-cylinder having a mouth for receiving and a nozzle for discharging the material to be canned, an oscillating segmental plunger within said cylinder, and an oscillating segmental follower, also within said cylinder, a can-feeder for supplying the cans in succession to the nozzle of the filling-cylinder, a material-feeder for feeding the material to be canned to the filling-cylinder, a liquid-feeder for supplying a regulated quantity of sweetened or salted water or other suitable liquid to each can, a sweeper for sweeping off the tops of the filled cans, and a vertically-reciprocating punch for pressing down the material at the mouths of the cans after the cans are filled, to facilitate the subsequent washing, capping, and sealing thereof. Some of these devices may be omitted, and each may be changed more or less without departing from the spirit of my invention.

The operative parts of the machine may be mounted upon any suitable supporting-frame. The frame shown is a portable stand constructed of metal, and comprises two similar side frames, A A, each of which embraces two legs, *a a*, an integral connecting-bar, *b*, and an upward curved extension, *c*. The legs are provided with perforated feet *d*, through which the machine may be bolted or screwed to the floor. The side frames, A A, are ribbed to impart stiffness and strength, and are connected near the bottom by bolt-rods *e e*. The upward extensions of the frame are connected and stiffened by a metal casting comprising two horizontal arms, A' A^2, and a vertical arm, A^3. The horizontal arms are provided at their ends with ears, through which they are bolted to the side frames, A A, the former near the top and the latter near the middle of said frame. The vertical arm A^3 is provided with parallel flanges *f f* on each side, which constitute, with the body of the arm, three sides of a square vertical channel, B, through which the cans to be filled are dropped. The horizontal arm A' is provided with ribs *f′ f′*, which extend from the outer ends of said arm to the vertical flanges *f f* of the vertical arm. A collar, *g*, square on its under side and circular on its upper side, is fitted by its square side

over the top of the can-channel B, and an extension-can spout, C, is fitted into the collar, and may extend to the second story. The open side of the can-channel B is provided with a vertical guide-piece, *h*, in the shape of a T inverted, said guide-piece being bolted to the collar *g*, and to the sides of the can-channel, and serving to retain the cans in position in the channel.

The cans to be filled are fed through the vertical can-spout C and vertical can-channel B to the rear end of a horizontal can-channel, D, which is attached at one end to said vertical can-channel, and supported at the other end by a curved brace, A^4, which extends between and is bolted to the side frames, A A. This horizontal can-channel serves to guide the cans, which are pushed forward intermittently therethrough, and, being closed at its top as well as at its sides and bottom, it prevents any spattering out of the material being canned during the filling process. The sides of this channel are provided with longitudinal ribs *i* near its top and bottom, to serve as guides, so that the channel proper may be of a width sufficient to receive any cans which may be slightly bulged at the center. One side of the channel is hinged, so that it can be swung open. Its top is provided near the center of its length with a square opening, through which the cans are filled, said opening being surrounded by upturned flanges *i'* of the top plate and upright flanges of the side plates. The bottom of this horizontal can-channel has a grated opening, i^2, to permit whatever juices may overflow from the cans to fall into a spout, D', through which said juices are conducted into a suitable receptacle.

The material to be canned is fed to the cans through a hollow filling-cylinder, E, located in front of the vertical can-channel and over the central opening of the horizontal can-channel. This cylinder is supported by a flanged bracket-arm, E', bolted to the vertical can-channel, and is provided at its bottom with a rectangular peripheral opening, *j*, and two horizontal flanges, *j' j'*, on opposite sides of said opening, to which a nozzle-plate, E^2, is bolted. The opening in the nozzle-plate is contracted from a rectangular form at its upper edge into an elongated downward-projecting tapering nozzle, j^2, which is adapted to fit into the mouth of a can to be filled. The nozzle-plate E^2 fits between the vertical flanges *i'*, surrounding the central opening in the top of the horizontal can-channel D, and is provided with circular or arc-shaped flaring lugs *k* around or on each side of the nozzle j^2, which lugs serve to guide the can to the nozzle, and also with a series of blunt studs, *k'*, which come in contact with the head of the can and prevent any tendency of the latter to bulge outward by reason of the sudden pressure caused by the injection of the material. The filling-cylinder is provided at its top with a peripheral opening or mouth, j^3, for the admission of the material to be canned, which mouth is somewhat larger than the discharge-opening *j*.

A driving-shaft, *m*, and two auxiliary cross-shafts, *n o*, turn in capped journal-boxes or other suitable bearings on the frame below the horizontal can-channel, and serve to impart motion to the several mechanisms of the machine. The driving-shaft *m* is provided at one end with a driving-pulley, G, and a loose pulley, G', to which motion is imparted by a belt in the usual manner. The belt is shifted by a forked belt-shipper, *p*, attached to the rod *p'*, which slides in bearings p^2 of the frame, and is provided at the opposite side of the machine with a looped handle, p^3. The opposite end of the driving-shaft *m* is provided with a pinion, G^2, which meshes with a gear-wheel, H, at one end of the shaft *n*. The shaft *n* is provided at its opposite end with a pinion, H', which meshes with and drives the gear-wheel I on the shaft *o*. The proportions of the pinion G^2 and the gear-wheel H are as one to three, but this is not essential, and of the pinion H' and gear-wheel I as one to two.

The gear-wheel H carries a crank-pin, *q*, to which the inner end of a connecting-rod, J, is attached, the outer end of said rod being pivoted to a laterally-projecting arm, K', of an upright oscillating lever-frame, K, the forked lower end of which is supported in a rod or rock-shaft, *r*, at the back of the machine. The upper end of this lever-frame is provided with an arm, K^2, to which is pivoted the horizontally-reciprocating can-pusher K^3. This can-pusher pushes the horizontal line of cans within the horizontal can-channel D forward through said channel, to and past the filling apparatus, and supports the vertical column of cans in the vertical channel B and spout C during its forward stroke, permitting said column to fall the height of one can at the end of its back stroke.

The connecting-rod J is in two parts, adjustable on each other by means of slots and set-screws to lengthen and shorten the rod. The pusher K^3 has a stroke sufficient to push the line of cans within the horizontal can-channel D a distance equal to the diameter of one can, and the adjustability of the connecting-rod enables the movements of the pusher to be adjusted, so that each stroke thereof will push the line of cans so as to bring a can to be filled to the exact point beneath the nozzle. The inner end of the horizontal can-channel D is recessed at its bottom beneath the vertical can-channel B. A steel plate, *s*, rests in this recess, and a rubber mat, *s'*, is placed under the steel plate, which relieves the shock and jar of the falling column of cans. When the line of cans is pushed forward, the second can in front of the pusher comes under the nozzle-plate E^2 and over a can-lifter, L, whereby it is lifted into contact with said nozzle-plate. The lower end of this can-lifter is provided with a slot, *t*, through which the shaft

n passes, the shaft thus serving as a guide for the lifter. The lifter is provided above its slot with a downward curved or inclined lug, t', and at its lower end with an upward curved or inclined lug, t^2. A cam, M, fixed to the shaft n, rotates between said lugs of the can-lifter and serves to raise and lower the same. The can-lifter is held against lateral motion by a collar, n', on the shaft n at one side of the lifter, and by the cam M at the other side thereof. The upper end of the can-lifter is forked, and passes through and is guided in two slots in the bottom of the can-channel.

A device for arresting the can to be filled in its forward movement as it comes opposite the nozzle of the filling-cylinder, and for forcing it down from the nozzle after being filled, is connected with the can-lifter; and it consists of a flat rod, u, which slides vertically in a groove in the interior of the vertical side of the can-channel, its upper end being bent at a right angle, and formed into a circular ring or loop, u', which constitutes a clamp which rests upon the top of the can, its rear portion being bent upward, so that it touches the can on two opposite sides only. The lower end of the rod u is slotted, and a horizontal projecting pin, u^2, attached to the can-lifter, passes, through the slot of the rod. A contractile spring, u^3, one end of which is connected to a pin, u^4, on the rod, and the other end to the pin u^2 of the can-lifter, tends to draw down the rod so as to clamp the can between the loop of the rod and the upper end of the can-lifter. The end of the loop of the clamp u' toward the pusher is bent or curved upward to permit the can to slide under it, and in its normal position is slightly less than the height of a can above the can-lifter and bottom of the horizontal can-channel. When the cans are pushed forward, the can in the rear of the lifter slides under the upturned end of the clamp, and the short slot in the rod u permits the latter to rise slightly against the tension of the spring u^3, the tension of said spring holding the clamp in frictional contact with the top of the can and preventing the momentum of the line of cans incident to the quick forward push. When the filling of the can is completed, the cam M, acting on the lug t^2 of the can-lifter, pulls down the can away from the nozzle. Thus the movement of the cans is made absolutely certain, which is a great advantage.

The filling mechanism proper includes with the cylinder E an oscillating segmental plunger, N, within said cylinder, an oscillating segmental follower, O, also within said cylinder, and actuating mechanism for said plunger and follower. The plunger N is a sector-shaped block, which fits closely within the cylinder, being adapted to turn therein. It is attached to a shaft, N', which extends from the bearing v on one side of the frame through the closed head of the cylinder to a line drawn vertically through the center of said cylinder. The follower O is a segment-shaped block, which is attached to a shaft, O', arranged in line with the shaft N' and extending from the bearings v' through the opposite head of the cylinder to the center line of said cylinder, where it meets the inner end of shaft N'. The inner ends of the shafts N' O' fit into hubs in the plunger and follower, respectively, each of which hubs is equal in length to half the length of the cylinder. The plunger and follower are preferably made hollow for lightness, and in such case they must be made water-tight. A segmental gear, P, is keyed to the plunger-shaft N' in proper relative position to the plunger. A segmental gear, Q, pivoted to the rock-shaft Q', meshes with the segment-gear P, being provided with teeth on the inner face of its periphery. These gears are of such proportions that one full movement thereof will oscillate the plunger within the cylinder a distance equal to the length of the arc-shaped periphery of the plunger, plus the width of the mouth of the cylinder. The segmental gear Q is oscillated by means of a connecting-rod, R, the upper end of which is jointed at 2 to a short slotted arm, R', bolted to a recessed groove in the arm Q^2 of the segment-gear Q. This rod is connected at its lower end to a crank-pin, w, on the gear-wheel I. The follower is actuated by a connection with the plunger-shaft. An arm, S, is clamped to the plunger-shaft N', so as to be actuated by frictional contact therewith. The outer end of this arm is provided with a long pin, S', which extends past the opposite end of the cylinder. An arm, S^2, is fixed to the follower-shaft O' and provided with short forks or hooks $y\ y'$ at its outer end. Stops $z\ z'$ are arranged on the cylinder-head. The pin S' oscillates between the stops $z\ z'$, and carries the arm S^2, so as to move the follower with the plunger until the latter has passed the mouth of the cylinder.

Supposing the plunger and follower to be in the position shown in Fig. 2 and the space between them at the mouth of the filling-cylinder to be filled with green corn or other material to be canned, the motion of the segment-gears turns the plunger toward the right, and the follower, by means of its connection with the plunger-shaft, turns with the plunger until the latter passes and closes the mouth of the filling-cylinder. The corn is then confined between the plunger and follower and the cylinder-casing. The plunger and follower continue to move in unison until the pin S' of the arm S reaches and is arrested by the lower stop, s', of the cylinder-head. The plunger continues to rotate and the pressure thereof upon the material between the plunger and follower forces the latter around until the hook y reaches the pin S', which is resting against the stop z'. The follower is thus brought to a rigid stop at a position on the left-hand side of the mouth of the cylinder, exactly corresponding to its former position on the right-hand

side thereof. The plunger still continues to advance, partially closing the space between it and the follower and forcing a given quantity of the contained corn or other material down through the discharge-opening and nozzle into the can beneath.

It will be seen that the plunger and follower, under the preferable arrangement shown, do not close together at the bottom of the cylinder, (as in such case it would require too much force to eject the last particles,) and the corn which is left in the space between them is carried back on the return of the follower to near the mouth of the cylinder, and when brought again to the discharge-opening is pushed out into a succeeding can, together with a portion of the corn last taken into the cylinder. As the space at the bottom of the cylinder between the plunger and follower is partially closed by the approach of the former toward the latter, a space of equal width is opened at the top of the cylinder between said plunger and follower, into which the material from the hopper falls, and a reverse movement of the gears oscillates the plunger and follower in the opposite direction and again fills a can, the plunger and follower being restored to their first position. The space opened between the plunger and follower at the top of the cylinder will hold a quantity sufficient to fill a can plus the amount carried back from the previous stroke; but this space may be reduced at pleasure, to allow room in the can for any required quantity of liquid, by adjusting the slotted arm R′ in the segmental gear Q, so as to regulate the sweep of the said gears. The swing of the follower is always the same; but the swing or stroke of the plunger may be regulated so as to force a greater or smaller quantity of the material down through the nozzle, according to the amount required for each can. With a short stroke of the plunger there will be more space left between the plunger and follower at the discharge-opening, and a smaller quantity of corn will be pressed out and a larger quantity carried back than with a long stroke of the plunger, while at the same time the receiving-space between the plunger and follower at the mouth of the cylinder will be reduced, so that when the plunger is once set for any desired quantity the measure is absolutely the same in each direction. The faces of the plunger are radial, while those of the follower are preferably beveled or inclined, to facilitate the discharge of the material.

The advantages of the rotary oscillating plunger and follower are that while a quantity of corn to fill one can is being pressed out at the bottom of the cylinder an equivalent quantity is being taken in at the top to fill the second can, and no time is lost; that the movement of the plunger tends to create a vacuum at the mouth of the cylinder and draw the corn into the cylinder; that the sucking up of the corn through the nozzle incident to reciprocating plungers is avoided, and that the corn is always cut off from the nozzle just after the stroke of the plunger is completed by the return past the nozzle of the follower, and consequently there is slight chance for leakage during the shifting of the cans and the stoppage of the machine. A suitable feeder for supplying the material to be canned to the filling-cylinder is arranged in connection with the latter. A force-feeder is preferably used, so as to insure the filling of the space between the plunger and follower at the top of the cylinder.

The following parts are found to work perfectly as a force-feeder. A hopper, F, surmounts the filling-cylinder, being supported by flanges U. Two oscillating ∩-shaped arms, T, serve as stampers, their rear ends having a pivotal connection with the frame, and their front ends being projected into the hopper and carrying hinged wings 3, which open outward automatically, as indicated in dotted lines, when pushed down through the material within the hopper, and close of their own weight when the stamper is raised. The rear ends of these arms T are attached to lugs 4 on a block, 5, which turns loosely on a rod, 6, which is supported in ears 7, attached to the collar G at the top of the vertical can-spout. This block is provided at one end with a lug, 8, to which the upper end of a connecting-rod, 9, is attached, said lug forming, with one of the lugs 4, a bell-crank lever. The lower end of this connecting-rod is provided with an elongated slot, 10, through which the shaft *o* passes, the shaft serving as a guide to the connecting-rod in its reciprocating movement, and with a roller-pin, 11, below said slot. The connecting-rod is reciprocated endwise by a double-grooved cam, 12, on the shaft *o*, into the groove of which cam the roller-pin projects.

While the plunger is closing upon the follower at the bottom of the filling-cylinder and beginning to open at the top, the roller-pin 11 on the connecting-rod is passing outward through a straight part of the slot in cam 12, whereby the rod is drawn downward and the stamper in the hopper lifted rapidly to near its highest point, and while said pin is passing one of the outer curves of the double cam the space at the mouth of the cylinder between the plunger and follower has become wide open. The roller-pin then passes inward in the straight return portion of the groove, whereby the connecting-rod is lifted and the stamper rapidly brought down, pushing sufficient corn before it, with what has already fallen into the cylinder, to fill the space between the plunger and follower at the mouth of the cylinder and slightly compress it therein, the surplus being squeezed out around the stamper, which is smaller than the discharge-opening of the hopper. The roller-pin of the connecting-rod then passes into the curved portion of the groove near the center of the cam, whereby the stamper is held down until

the plunger has moved back past the mouth of the cylinder and cut off the exit or entrance of any more corn. The given space between the plunger and follower is thus compressed full of corn, after which the stamper rises, as before, by the action of the other half of the double cam, there being two strokes of the plunger and two of the stamper to each revolution of the shaft *o*.

It is designed that the corn or other material to be canned be kept about the height in the hopper of the irregular dotted line in Fig. 2.

A device for forcing a given quantity of sweetened or salted water or other liquid into each can consists of a pump, 13, arranged horizontally at one side of the horizontal can-channel D, a discharge-pipe, 14, leading from said pump, the nozzle of which is arranged over the can in the rear of the nozzle of the filling-cylinder, and a suction-pipe, 15, connected with said pump. The piston-rod 16 of this pump is turned back upon itself outside of the pump and extended back outside of the pump-cylinder, passing loosely through a hole in the fork 17 of the oscillating lever-frame K, which actuates the can-pusher so that an outward movement of the lever-frame effects an inward stroke of the plunger. A fast collar, 18, at the outer end of said rod connects it with said fork, and an adjustable collar, 19, serves to regulate the length of stroke of the pump, and consequently the quantity of liquid discharged into a can. The rod is graduated to indicate the ounces or fractions of ounces of liquid which will be discharged into the can at each stroke of the piston when the adjustable collar is fixed at a given point.

It has been found necessary or desirable to the proper washing, capping, and sealing of the cans after being filled that the contents thereof at the mouth of the can be below the top of the can, and hence the material has been crowded down by hand or with a hand-tool after filling.

This machine is provided with an attachment, which acts automatically to press down the contents of the can at its mouth after the can is filled. The lever 20, slotted at both ends, is pivoted at 21 to a lug, 22, of the curved brace A^4 of the frame. The inner end of this lever is connected to the same pin u^2 of the can-lifter which operates the can-clamp, and its outer end is connected to the lower end of a rod, 23, which slides vertically in supports 24, attached to the horizontal can-channel D. The upper end of this rod is bent at a right angle, and carries a depending tapering punch, 25. A hole is made in the top of the horizontal can-channel D, below this punch, so arranged that the hole and the punch are exactly over the center of the second can, in advance of the nozzle when in operation. When a can is raised by the can-lifter into contact with the nozzle to be filled, the inner end of the lever 20 is raised, the rod 23 drawn down by the outer end of said lever, and the punch 25 depressed, passing through the hole in the top of the can-channel and into the second can in advance of the nozzle. When the can at the nozzle is lowered therefrom, the motion of the lever 20 is reversed and the punch raised. As thus arranged, the movement of the punch occurs while the line of cans is stationary. The forward movement of the cans under the action of the can-pusher takes place while the punch is at its highest point. The length of stroke of the punch is about twice that of the can-lifter, the fulcrum of the lever being properly adjusted to secure this end. The punch nearly fills the hole or mouth in the top of the can and pushes down the material therein so as to effectually avoid interference thereof with the washing, capping, and sealing operations to which the cans are subsequently subjected.

It often happens in packing corn that stray kernels are pulled from the nozzle in the passage of the cans and drop upon the top thereof, and are either wasted or cause inconvenience by being deposited in the casing of my can-washing machine patented to me by Letters Patent No. 282,434. To avoid this the horizontal can-channel D is provided immediately in front of the nozzle-plate with a flexible scraper, 26, which extends across the can-channel D and projects a little below the plane of the can-tops. As the cans are pushed through the channel, this scraper sweeps off the corn or other material from the tops thereof, and it falls into the spout D, and may be caught and saved. This scraper may be composed of sheet-rubber, secured by a piece of sheet metal and by means of screws to one of the flanges of the top of the can-channel.

I claim as my invention and desire to secure by Letters Patent—

1. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, a rotary segmental plunger within said cylinder, and a rotary segmental follower, also within said cylinder.

2. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, and an oscillating segmental follower within said cylinder.

3. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, an oscillating segmental follower within said cylinder, and a can-feeder for supplying the cans in succession to the filling-cylinder.

4. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental

plunger within said cylinder, an oscillating segmental follower within said cylinder, and a material-feeder for feeding the material to be canned to the filling-cylinder.

5. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, an oscillating segmental follower within said cylinder, a can-feeder for supplying the cans in succession to the nozzle of the filling-cylinder, and a material-feeder for feeding the material to be canned to the filling-cylinder.

6. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, an oscillating segmental follower within said cylinder, and a liquid-feeder for supplying a regulated quantity of sweetened or salted water or other suitable liquid to each can.

7. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, an oscillating segmental follower within said cylinder, a can-feeder for supplying the cans in succession to the filling-cylinder, and a liquid-feeder for supplying a regulated quantity of sweetened or salted water or other suitable liquid to each can.

8. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, an oscillating segmental follower within said cylinder, a can-feeder for supplying cans in succession to the filling-cylinder, a material-feeder for feeding the material to be canned to the filling-cylinder, and a liquid-feeder for supplying a regulated quantity of sweetened or salted water or other suitable liquid to each can.

9. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, an oscillating segmental follower within said cylinder, a horizontal can-channel, and a horizontally-reciprocating can-pusher.

10. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, an oscillating segmental follower within said cylinder, a horizontal can-channel, a vertical can-channel, and a horizontally reciprocating can-pusher.

11. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, an oscillating segmental follower within said cylinder, a horizontal can-channel, a horizontally-reciprocating can-pusher, and a vertically-reciprocating can-lifter.

12. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, an oscillating segmental follower within said cylinder, a horizontal can-channel, a vertical can-channel, a horizontally-reciprocating can-pusher, and a vertically-reciprocating can-lifter.

13. In a can-filling machine, the combination, substantially as set forth, of a can-filler, a vertically-reciprocating can-lifter, and a can-clamp.

14. In a can-filling machine, the combination, substantially as set forth, of a can-filler, a horizontal can-channel, a horizontally-reciprocating can-pusher, a vertically-reciprocating can-lifter, and a can-clamp.

15. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, an oscillating segmental follower within said cylinder, a horizontal can-channel, a horizontally-reciprocating can-pusher, a vertically-reciprocating can-lifter, and a can-clamp.

16. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, an oscillating segmental follower within said cylinder, and a hopper above said cylinder.

17. The combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, an oscillating segmental follower within said cylinder, a hopper above said cylinder, and a reciprocating stamper within said hopper.

18. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, an oscillating segmental follower within said cylinder, a hopper above said cylinder, and a reciprocating stamper within said hopper, provided with hinged wings which open automatically as the stamper is depressed and close as it is raised.

19. The combination, with the hopper of a can-filling machine, of a stamper consisting of arms provided with wings which open automatically as the stamper is depressed and close as it is raised, substantially as set forth.

20. The combination, with a can-filling machine, of a vertically-reciprocating punch for pressing down the material in the can after the filling thereof, substantially as set forth.

21. In a can-filling machine, the combination, substantially as set forth, of a horizontal can-channel, a horizontally-reciprocating can-

pusher, and a vertically-reciprocating punch for pressing down the material in the can after the filling thereof.

22. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, an oscillating segmental follower within said cylinder, a horizontal can-channel, a horizontally-reciprocating can-pusher, and a vertically-reciprocating punch for pressing down the material in the can after the filling thereof.

23. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, an oscillating segmental follower within said cylinder, a can-feeder for supplying cans in succession to the filling-cylinder, a material-feeder for feeding the material to the can from the filling cylinder, a liquid-feeder for supplying a regulated quantity of sweetened or salted water or other suitable liquid to each can, and a vertically-reciprocating punch for pressing down the material in the can after the filling thereof.

24. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, and an oscillating segmental follower within said cylinder, the face of the follower being beveled, substantially as set forth.

25. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, and an oscillating segmental follower within said cylinder, operated by frictional connection with the plunger-shaft.

26. In a can-filling machine, the combination, substantially as set forth, of the filling-cylinder provided with receiving and discharge openings, an oscillating segmental plunger within said cylinder, an oscillating segmental follower within said cylinder, the independent shafts to which said plunger and follower are respectively attached, the segmental gears for actuating the plunger-shaft, the friction-arm on said plunger-shaft, the hooked arm on said follower-shaft, the pin attached to said friction-arm for operating said hooked arm, and suitable stops to arrest the movement of said arms.

27. In a can-filling machine, a horizontal can-channel, through which the cans are fed, closed at its top, sides, and bottom, substantially as set forth.

28. In a can-filling machine, a horizontal can-channel, through which the cans are fed, provided with a flexible scraper for sweeping the tops of the cans after the filling thereof, substantially as set forth.

29. In a can-filling machine, a horizontal can-channel, through which the cans are fed, provided with a grated opening in its bottom past the filling device, and a spout for conducting off the overflow of juice, substantially as set forth.

30. In a can-filling machine, the combination of a vertical can-channel through which the cans fall, and a horizontal can-channel provided with a rubber mat at its connection with the vertical can-channel to receive the shock of the falling column of cans, substantially as set forth.

31. In a can-filling machine of the character described, the combination, substantially as set forth, of the can-lifter provided with a slot and lugs at its lower end, a shaft passing through the slot of said lifter and serving to guide said lifter, and a cam on said shaft, adapted to rotate between said lugs for raising and lowering said lifter.

32. In a can-filling machine of the character described, the combination of a can-clamp consisting of a vertically-sliding rod provided with a clamp at one end and a slot at the other end, a rising and falling pin projecting through said slots, and a spring connected at one end to said rod and at the other end to said pin, substantially as set forth.

33. In a can-filling machine of the character described, the combination of the horizontal can-channel, the vertically-reciprocating can-lifter, the vertically-sliding rod, the punch attached to said rod for pressing down the material filled into the can, and the lever and pin connecting said rod with the can-lifter, substantially as set forth.

34. In a can-filling machine of the character described, the combination of the oscillating lever-frame K, provided with the arms K′, K², and 17, the horizontal can-channel D, the actuating-rod J, connected to said arm K′, the can-pusher connected to said arm K², and the pump 13, the piston-rod 16 of which is connected to said arm 17, substantially as described.

35. In a can-filling machine of the character described, the combination, substantially as set forth, of the filling-cylinder E, the oscillating segmental plunger N within said cylinder, the oscillating segmental follower O within said cylinder, the mechanism, substantially as described, connecting said plunger and follower, for actuating the latter, the segmental gear P on the plunger-shaft, the segmental gear Q, meshing with said gear P and provided with the extension-arm Q², the crank-wheel I, and the rod R, connecting said crank-wheel with said extension-arm.

36. In a can-filling machine of the character described, the combination, substantially as set forth, of the filling-cylinder E, the oscillating segmental plunger N within said cylinder, the oscillating segmental follower O within said cylinder, the mechanism, substantially as described, connecting said plunger and follower,

for actuating the latter, the segmental gear P on the plunger-shaft, the segmental gear Q, meshing with said gear P and provided with the extension-arm Q^2, the crank-wheel I, the arm R′, adjustable on the arm Q^2, and the connecting-rod R.

37. In a can-filling machine of the character described, the combination, substantially as set forth, of the shaft *n*, provided with the toothed crank-wheel H, the pinion H′, and cam M, the shaft *o*, provided with the toothed crank-wheel I and with the double cam 12, the can-channel D, the can-pusher K^3, the lever K, the rod J, connecting said lever with the wheel H, the can-lifter L, actuated by said cam M, the filling-cylinder E, the plunger and follower within said cylinder, mechanism, substantially as described, connecting said plunger and follower, the segmental gear P, the segmental gear Q, provided with the arm Q^2, the rod R, connecting said arm with the crank-wheel I, the hopper above said cylinder, the oscillating stamper T, and the rod 9, provided with the pin 11, and connecting the arm 8 of said stamper with said double cam.

38. In a can-filling machine of the character described, the combination, substantially as set forth, of the shaft *n*, provided with the toothed crank-wheel H, the pinion H′, and cam M, the shaft *o*, provided with the toothed crank-wheel I, and with the double cam 12, the can-channel D, the can-pusher K^3, the lever-frame K, the rod J, connecting said lever-frame with the wheel H, the can-lifter L, actuated by said cam M, the filling-cylinder E, the plunger and follower within said cylinder, mechanism, substantially as described, connecting said plunger and follower, the segmental gear P, the segmental gear Q, provided with the arm Q^2, the rod R, connecting said arm with the crank-wheel I, the hopper above said cylinder, the oscillating stamper T, the rod 9, provided with the pin 11, and connecting the arm 8 of said stamper with said double cam, and the pump 13, the piston-rod 16 of which is connected to said lever-frame K.

39. In a can-filling machine of the character described, the combination, substantially as set forth, of the shaft *n*, provided with the toothed crank-wheel H, the pinion H′, and cam M, the shaft *o*, provided with the toothed crank-wheel I and with the double cam 12, the can-channel D, the can-pusher K^3, the lever-frame K, the rod J, connecting said lever-frame with the wheel H, the can-lifter L, actuated by said cam M, the filling-cylinder E, the plunger and follower within said cylinder, mechanism, substantially as described, connecting said plunger and follower, the segmental gear P, the segmental gear Q, provided with the arm Q^2, the rod R, connecting said arm with the crank-wheel I, the hopper above said cylinder, the oscillating stamper T, the rod 9, provided with the pin 11, and connecting the arm 8 of said stamper with said double cam, the pump 13, the piston-rod 16 of which is connected to said lever-frame K, the pin u^2 on the can-lifter, and the clamp *u*.

40. In a can-filling machine of the character described, the combination, substantially as set forth, of the shaft *n*, provided with the toothed crank-wheel H, the pinion H′, and cam M, the shaft *o*, provided with the toothed crank-wheel I and with the double cam 12, the can-channel D, the can-pusher K^3, the lever-frame K, the rod J, connecting said lever-frame with the wheel H, the can-lifter L, actuated by said cam M, the filling-cylinder E, the plunger and follower within said cylinder, mechanism, substantially as described, connecting said plunger and follower, the segmental gear P, the segmental gear Q, provided with the arm Q^2, the rod R, connecting said arm with the crank-wheel I, the hopper above said cylinder, the oscillating stamper T, the rod 9, provided with the pin 11 and connecting the arm 8 of said stamper with said double cam, the pump 13, the piston-rod 16 of which is connected to said lever-frame K, the sliding rod 23, provided with the punch 25, and the lever 20, connecting said rod with the pin u^2 on the can-lifter.

41. In a can-filling machine of the character described, the combination, substantially as set forth, of the shaft *n*, provided with the toothed crank-wheel H, the pinion H′, and cam M, the shaft *o*, provided with the toothed crank-wheel I and with the double cam 12, the can-channel D, the can-pusher K^3, the lever-frame K, the rod J, connecting said lever-frame with the wheel H, the can-lifter L, actuated by said cam M, the filling-cylinder E, the plunger and follower within said cylinder, mechanism, substantially as described, connecting said plunger and follower, the segmental gear P, the segmental gear Q, provided with the arm Q^2, the rod R, connecting said arm with the crank-wheel I, the hopper above said cylinder, the oscillating stamper T, the rod 9, provided with the pin 11 and connecting the arm 8 of said stamper with said double cam, the pump 13, the piston-rod 16 of which is connected to said lever-frame K, the pin u^2 on the can-lifter, the clamp *u*, the sliding rod 23, provided with the punch 25, and the lever 20, connecting said rod with the pin u^2 on the can-lifter.

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