

(No Model.)

4 Sheets—Sheet 1.

C. E. BARBER.
CAN FILLING MACHINE.

No. 581,388.

Patented Apr. 27, 1897.

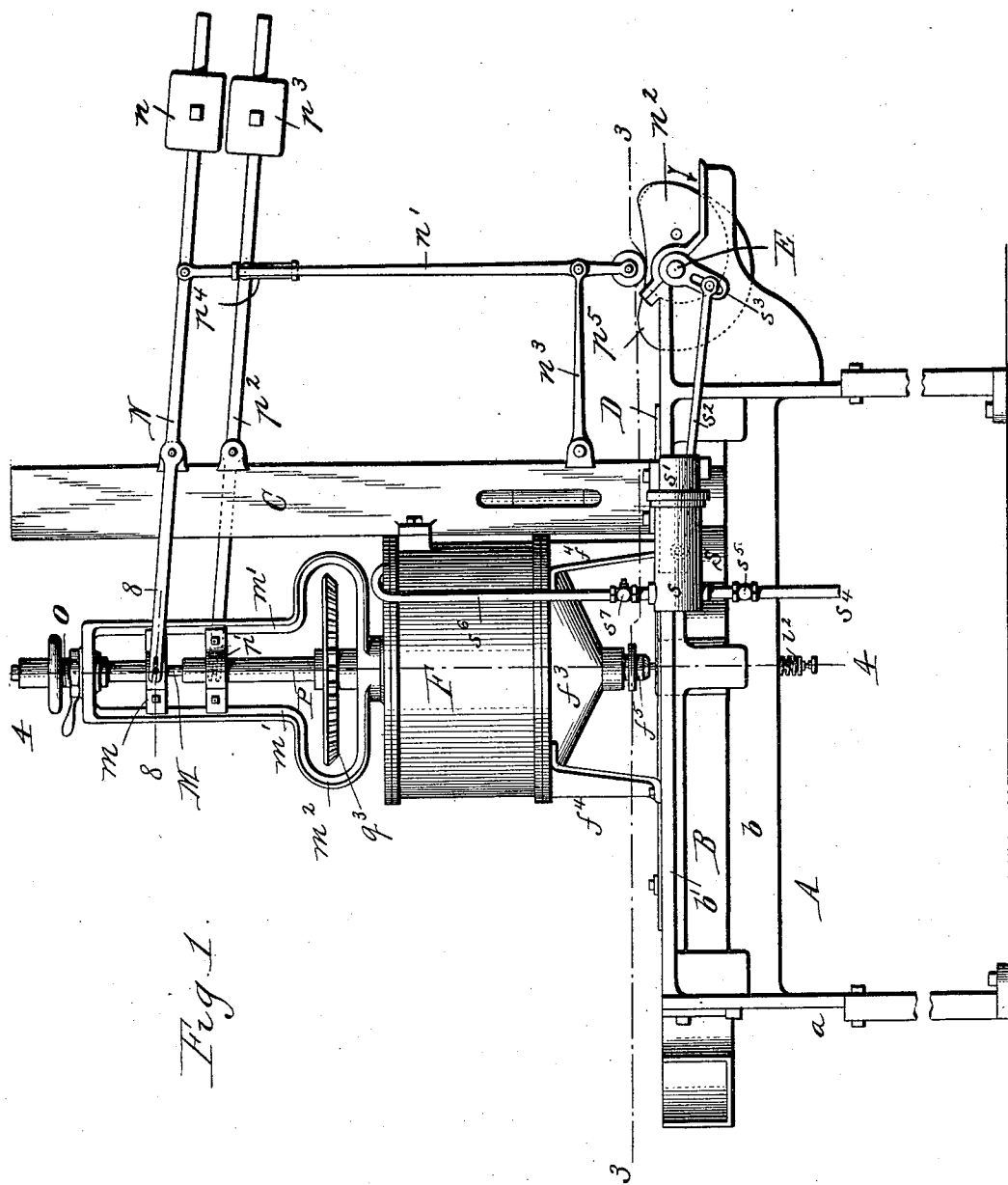


Fig. 1.

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Chas. E. Barber INVENTOR.

By Wilhelm H. Bomer

ATTORNEYS.

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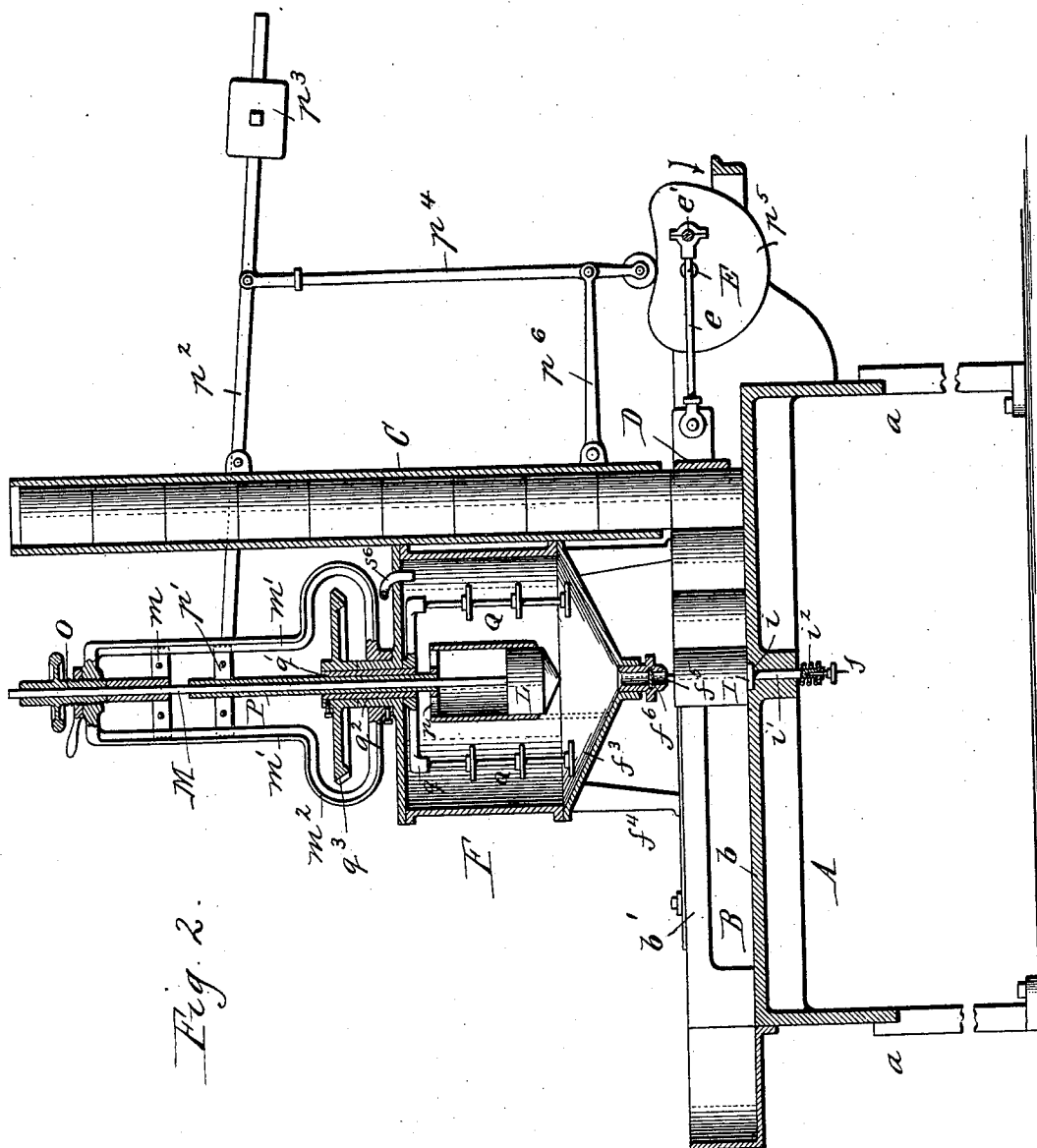


Fig. 2.

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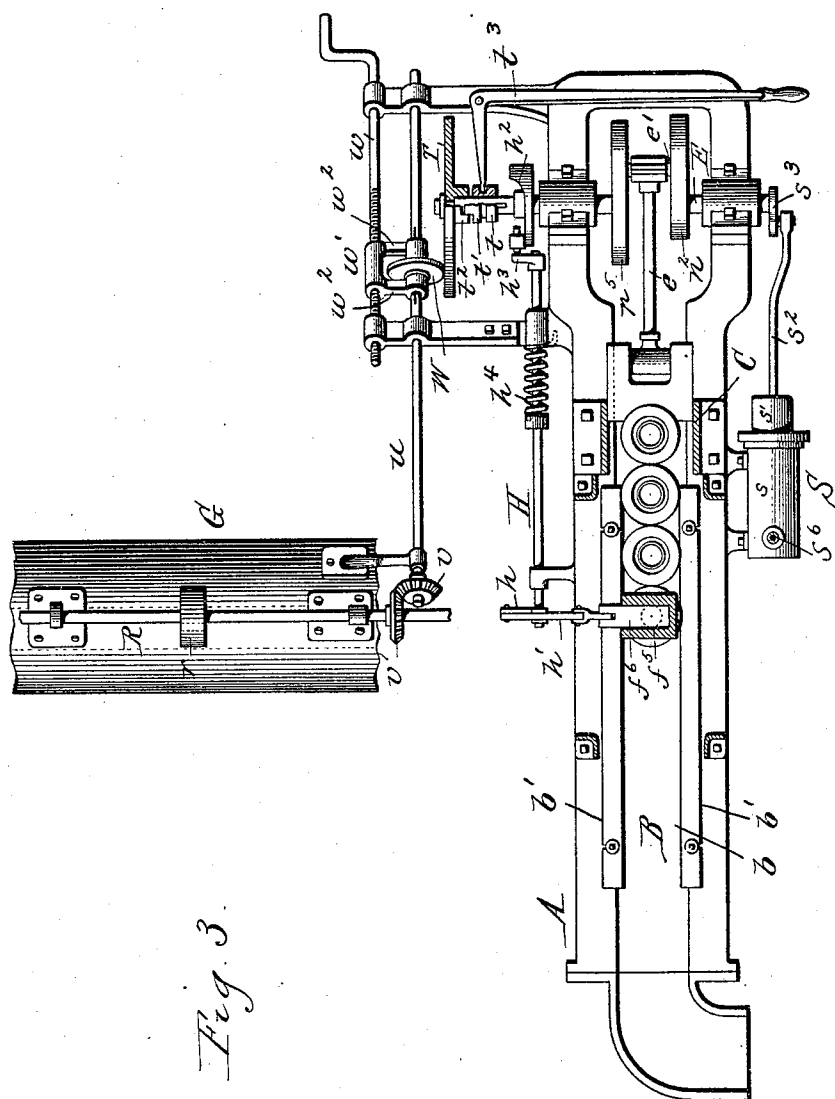
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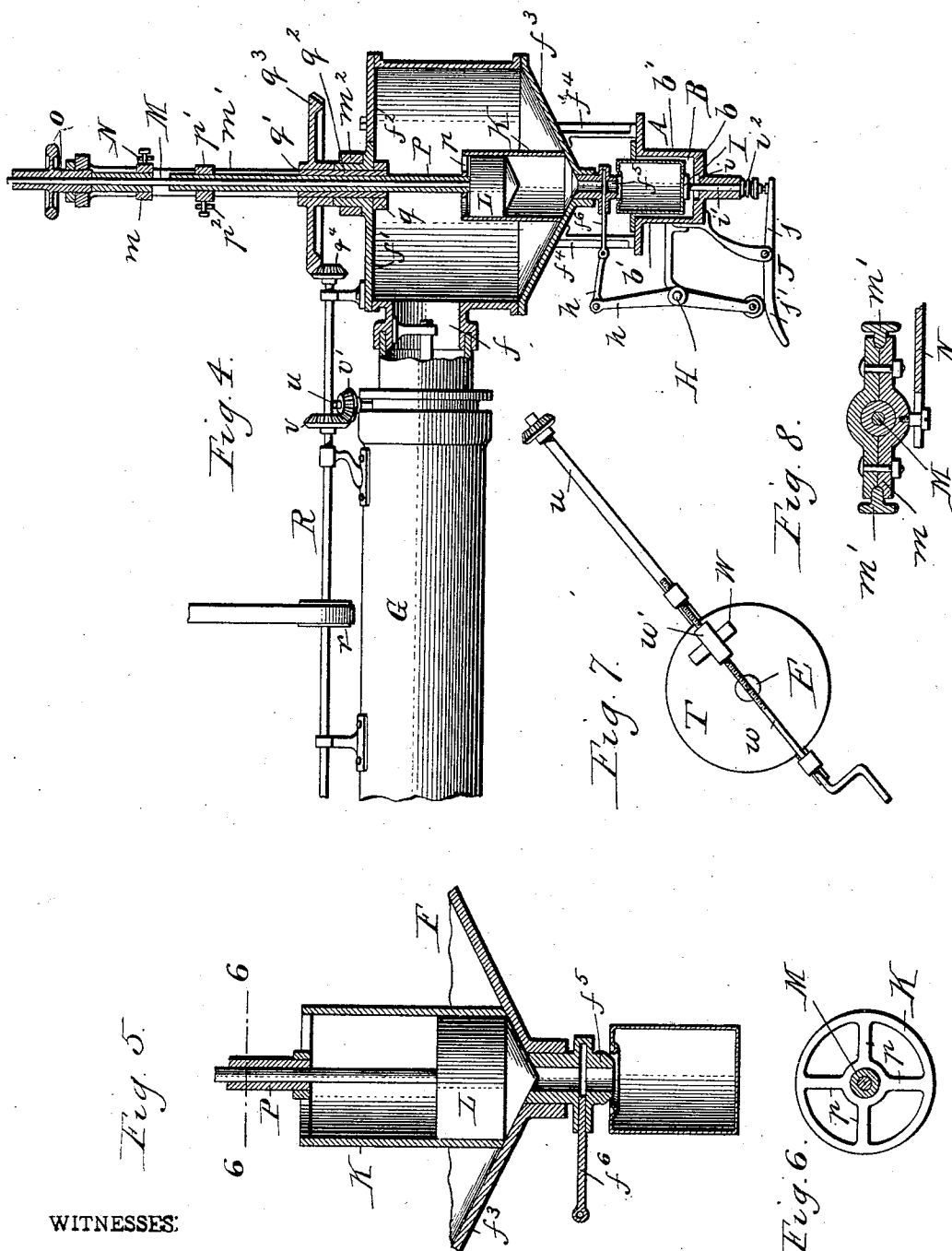
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4 Sheets—Sheet 4.

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UNITED STATES PATENT OFFICE.

CHARLES E. BARBER, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE
HEMINGWAY MANUFACTURING COMPANY, OF SAME PLACE.

CAN-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 581,388, dated April 27, 1897.

Application filed January 4, 1896. Serial No. 574,324. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. BARBER, a citizen of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have invented new and useful Improvements in Can-Filling Machines, of which the following is a specification.

This invention relates to can-filling machines whereby cans are automatically filled with the material to be packed or preserved—for instance, green corn, peas, &c.

The object of my invention is the production of a simple and efficient machine for this purpose by which a definite and uniform quantity of material is fed into each can.

My invention has the further object to improve the driving mechanism so as to permit of readily varying the speed of the can-filling machine from time to time as may be necessary to adjust its action to that of the cooking-machine, from which the material is delivered to the filling-machine.

In the accompanying drawings, consisting of four sheets, Figure 1 is a front elevation of my improved can-filling machine. Fig. 2 is a longitudinal sectional elevation thereof, taken centrally through the machine and showing the measuring-cylinder and plunger elevated. Fig. 3 is a horizontal section thereof in line 3 3, Fig. 1. Fig. 4 is a vertical transverse section in line 4 4, Fig. 1, showing the measuring-cylinder depressed. Fig. 5 is a fragmentary sectional elevation, on an enlarged scale, of the lower portion of the feed-hopper, measuring-cylinder, plunger, and adjacent parts, showing the cylinder and plunger both depressed. Fig. 6 is a horizontal section in line 6 6, Fig. 5. Fig. 7 is a fragmentary rear elevation of the driving mechanism, showing the means for changing the speed of the can-filling machine. Fig. 8 is a horizontal section, on an enlarged scale, in line 8 8, Fig. 1.

Like letters of reference refer to like parts in the several figures.

A represents the frame of the can-filling machine, which is provided near its ends with supporting-legs *a a*. The upper portion of the frame is provided with a horizontal can guide or channel B, extending lengthwise of the machine and composed, essentially, of a

bottom or table *b* and two side rails *b'*, arranged above the bottom and on opposite sides thereof. C represents the usual vertical can-magazine, which is arranged with its open lower end over the front portion of the can-guide and from which the empty cans are delivered successively to the can-guide. D represents the horizontal reciprocating can-carrier, which is guided in the front portion of the can-guide and whereby the cans, after they drop from the magazine into the can-guide, are moved toward the filling apparatus. This carrier is actuated from the filler-shaft E, journaled in bearings on the front end of the frame, by a pitman *e*, connecting the can-carrier with a crank *e'* on this shaft. All of these parts may be of any ordinary or suitable construction.

F represents a feed hopper or receiver which receives the material to be packed and from which the material is delivered into the cans. This receiver is arranged over the can-guide in rear of the can-magazine and is preferably cylindrical. The material to be canned may be placed into the feed-hopper in any suitable manner, but is preferably supplied from a cooking apparatus G, of any suitable construction, having its discharge-spout connected with an inlet-spout *f* on the rear side of the feed-hopper. This hopper is preferably provided with a cover *f'*, having a removable section *f''*, by which access can be had to the interior of the hopper.

*f*³ represents the conical bottom of the hopper, and *f*⁴ the legs by which the hopper is supported on the rails of the can-guides. The bottom of the feed-hopper is provided with a discharge-nozzle *f*⁵, which is arranged over the path of the cans in line with the openings thereof and which is opened and closed by a transversely-sliding valve *f*⁶, arranged in the nozzle, Figs. 2, 3, 4, and 5.

H represents a rock-shaft whereby the nozzle-valve is opened and closed and which is journaled lengthwise in bearings on the rear side of the main frame. This rock-shaft is provided with an upper rock-arm *h*, which is connected with the valve by a link *h'*. The rock-shaft is rocked in one direction by a cam *h*², mounted on the filler-shaft and engaging with a rock-arm *h*³ on the rock-shaft, and in

the opposite direction by a spring h^4 , secured with its ends to the main frame and the rock-shaft. Any other suitable mechanism for operating this valve may, however, be substituted, if desired.

I represents a lifting plate or device whereby each can when it arrives with its opening underneath the nozzle of the feed-hopper is elevated so that the nozzle projects into the can during the operation of filling, after which the can is again lowered upon the bottom of the can-guide. This plate is arranged in a socket i in the bottom of the can-guide and is secured to the upper end of the guide-rod i' . The lifting-plate is yieldingly held in a depressed position by a spring i^2 and is elevated by means of a rock-lever J, bearing with its front arm j against an adjusting-screw in the lower end of the guide-rod and with its rear arm j' against the lower arm h of the rock-lever, as represented in Fig. 4. After the filled can has been lowered it is pushed forward by the next following empty can, which latter takes its place under the nozzle in a well-known manner.

K represents a vertical measuring shell or cylinder whereby the quantity of material which is to be delivered into each can is measured and separated from the body of the material contained in the hopper. This cylinder is arranged centrally in the feed-hopper, so as to be separated from the side wall of the receiver by an intervening space which is free to be occupied by the material to be packed and has a vertically-reciprocating movement toward and from the bottom of the feed-hopper. Upon elevating the measuring-cylinder the material in the hopper fills the space below the cylinder, and upon subsequently depressing the cylinder until it bears against the bottom of the hopper the cylinder separates a cylindrical portion of the material from the remaining material in the hopper and incloses the same.

L represents a plunger which is arranged within the measuring-cylinder and whereby the material confined by the latter is forced out through the discharge-nozzle and into the can underneath the same. The lower face of this plunger is preferably conical to fit the conical bottom of the hopper, thereby displacing practically all of the material which is confined by the cylinder upon forcing the plunger against the bottom of the hopper.

Preparatory to filling a can the cylinder and plunger are both elevated, as represented in Fig. 2, and the material fills the space below the same. During the descent of the cylinder the plunger remains in its elevated position until the cylinder reaches the end of its downward movement, as represented in Fig. 4. The cylinder remains in this depressed position until the plunger during its subsequent downward movement has reached the end of its stroke, as represented in Fig. 5. When the plunger has finished its downward movement, the plunger and cylinder are ele-

vated simultaneously to their highest position, where they remain at rest a sufficient period to permit the material to again fill the space formed in the lower portion of the feed-hopper by the ascent of the cylinder and plunger. The valve in the nozzle remains shut during the time that the cylinder descends and opens at the beginning of the downward movement of the plunger. When the latter has reached the end of its downward movement, the valve closes and remains in this position during the upward movement of the cylinder and plunger. The cylinder is open at its upper end, whereby the cylinder is permitted to move freely downward over the plunger without being cushioned, which otherwise would occur if the upper end of the cylinder were closed. The open upper end of the cylinder also permits any material which may leak past the plunger during its descent to return from the top of the cylinder into the feed-hopper. As the filling apparatus is wholly inclosed by the feed-hopper any leakage which may take place between the hopper and the lower edge of the cylinder or between the cylinder and plunger is not as objectionable as it would be if it occurred outside of the feed-hopper.

The measuring-cylinder and plunger are actuated by the following mechanism:

M represents a vertical reciprocating plunger-rod carrying the plunger at its lower end and provided near its upper end with a cross-head m . The latter is guided on vertical ways m' , formed on a yoke m^2 , secured to the top of the feed-hopper.

N represents an upper rock-lever pivoted on the front side of the can-magazine and loosely connected with its inner arm to the cross-head of the reciprocating rod and provided at its outer arm with a weight n , which tends to normally raise the plunger.

n' is a vertical actuating-rod connected at its upper end with the outer arm of the upper rock-lever and provided at its lower end with a roller which bears against a cam n^2 . This cam is secured to the filler-shaft E, and upon turning the cam in the direction of the arrow, Fig. 1, when the parts are in the position shown in this figure the plunger is depressed. The lower end of the actuating-rod n' is held in its operative position by a steadying-link n^3 , which connects said rod with the can-magazine.

O represents an adjustable stop whereby the upward movement of the plunger may be varied to regulate the quantity of material which the measuring-cylinder can receive below the plunger and which is forced by the plunger into each can. This stop preferably consists of an externally-screw-threaded sleeve surrounding the plunger-rod above its cross-head and engaging in a screw-threaded opening in the upper portion of the yoke. The plunger is always moved downward to the same place by the cam n^2 , and its upward movement is arrested by the cross-head of

the plunger striking this adjustable sleeve. When it is desired to reduce the quantity of material which is discharged into each can, the sleeve is lowered so as to reduce the extent of the upward movement of the plunger, thereby reducing the space between the under side of the plunger and the bottom of the feed-hopper, whereby a smaller amount of material is received by the measuring-cylinder and subsequently discharged by the plunger. When it is desired to increase the volume of each discharge, the sleeve is raised so as to permit the plunger to be lifted to a higher point, thereby permitting more material to enter the cylinder below the plunger. By this means the quantity of material which is discharged into each can can be accurately regulated.

P represents a supporting-sleeve surrounding the plunger-rod M and connected at its lower end with the upper end of the measuring-cylinder by arms p . The upper end of the sleeve is provided with a cross-head p' , which is guided on the ways of the yoke m . p^2 is a lower rock-lever pivoted on the rear side of the can-magazine and connected at its inner end with the cross-head of the supporting-sleeve and provided at its outer end with a weight p^3 for holding the measuring-cylinder normally in an elevated position.

p^4 is a vertical actuating-rod connected at its upper end with the outer arm of the lower rock-lever and provided at its lower end with a roller which bears against a cam p^5 . The latter is secured to the filler-shaft E, and upon turning the same in the direction of the arrow, Fig. 2, when the parts are in the position shown in this figure, the measuring-cylinder is depressed.

p^6 is a link which steadies the lower portion of the rod p^4 .

Q represents rotating stirrers arranged in the feed-hopper around the measuring-cylinder and connected at their upper ends by a cross-bar q , which latter is secured to the lower end of a tubular shaft q' . This shaft surrounds the supporting-sleeve and is journaled in a bearing q^2 , formed in the top of the feed-hopper. The upper end of the tubular shaft projects above the top of the feed-hopper and is provided with a gear-wheel q^3 , which meshes with a pinion q^4 , as shown in Fig. 4. This pinion is arranged on the end of the main driving-shaft R, which latter is arranged lengthwise over the cooking apparatus G and driven by a belt passing around a pulley r on the main shaft.

S represents a syrup-pump whereby a preserving-syrup of any suitable kind is delivered into the body of the material in the feed-hopper. The cylinder s of this pump is secured to the front side of the main frame, and its plunger s' is connected by a pitman s^2 with a crank-arm s^3 on the front end of the filler-shaft E. s^4 is the suction-pipe of the pump, which is provided with a check-valve s^5 , and s^6 is the discharge-pipe of the pump, which is

provided with a check-valve s^7 and terminates in the upper portion of the feed-hopper, as represented in Figs. 1 and 2.

In order to enable the measuring-cylinder to always cut off or separate a full charge of material from the batch in the feed-hopper, the latter must be kept full enough to keep the space below the cylinder completely filled. Otherwise the measuring-cylinder would be partly empty, thereby producing short-weight cans.

When the filling-machine receives the material directly from a continuous corn-cooking apparatus, as illustrated in the drawings, it is necessary to regulate the speed of the filling mechanism so as to conform to the discharge of the material from the cooker. This discharge is not constant, but varies from time to time during the operation of the apparatus from variations in the feeding and other causes, and it is therefore necessary that means should be provided by which the attendant can increase or reduce the speed of the filling mechanism in such a way that the material in the hopper is maintained practically at the same level under the varying supply coming from the cooking apparatus. The filling mechanism is for this purpose driven from the shaft of the cooking apparatus by a variable-speed gear which connects the shaft of the cooking apparatus with the filler-shaft and which is constructed as follows:

T represents a friction wheel or disk mounted loosely on the rear end of the filler-shaft and capable of being connected with or disconnected from said shaft by a clutch-collar t , which is keyed to the said shaft and provided with lugs t' , adapted to be engaged with or disengaged from similar lugs t^2 on the hub of the friction-wheel by sliding the clutch-collar lengthwise on the shaft. The clutch-collar is operated by a hand-lever t^3 , pivoted on the main frame, as shown in Fig. 3.

u represents an inclined intermediate shaft extending diametrically across the rear face of the friction-wheel and journaled in bearings on the main frame. This shaft is driven from the main shaft of the cooking apparatus by a pair of bevel gear-wheels $v v'$, as shown in Fig. 3.

W represents a friction-roller bearing with its periphery against the rear face of the friction-wheel and keyed to the inclined shaft, so that the motion of this shaft is transmitted to the friction-wheel. This roller is capable of adjustment toward or from the center of the friction-wheel, and by so adjusting the roller the speed of the friction-wheel is increased or decreased.

w is a screw-shaft whereby the friction-roller is adjusted on the face of the friction-wheel and which is journaled in bearings on the main frame and held against lengthwise movement therein.

w' is a screw-nut arranged on the screw-shaft and provided with two arms w^2 , which embrace the inclined shaft on opposite sides

of the friction-roller. Upon turning the screw-shaft by the crank at one end thereof the screw-nut is moved lengthwise on the screw-shaft and the friction-roller is shifted
 5 radially on the face of the friction-wheel, thereby changing the speed of the latter. If little material is supplied to the filling apparatus, the speed of the latter is reduced, and if the supply of material is abundant the
 10 speed of the filling apparatus is increased, thereby enabling the level of material in the feed-hopper to be maintained at the proper height.

The mechanisms herein described and
 15 shown for operating the measuring-cylinder and plunger and for operating the filling apparatus from the cooking apparatus are the best known to me, but it is obvious that either mechanism may be modified in many respects
 20 without departing from my invention.

I claim as my invention—

1. In a can-filling machine, the combination with a receiver which is adapted to contain the material to be packed and which has
 25 a discharge-nozzle in its bottom and a valve controlling said nozzle, of a vertically-movable measuring-shell arranged within said receiver and adapted to close upon the bottom thereof around said nozzle, a plunger arranged within said shell, means whereby said
 30 measuring-shell is first raised and then lowered upon said bottom while said valve is closed, and means whereby said plunger is lowered after said valve has been opened,
 35 substantially as set forth.

2. The combination with a receiver which is adapted to contain the material to be packed and which has a discharge-nozzle in its bottom and valve controlling said nozzle, of a
 40 vertically-movable measuring-shell arranged within said receiver around said nozzle, means whereby said shell is raised and lowered while said valve is closed, a plunger arranged within said shell, means whereby said plunger
 45 is lowered after said valve has been opened, and a rotating stirrer arranged within said receiver outside of said measuring-shell, substantially as set forth.

3. The combination with a receiver adapted to receive the material to be packed and having a discharge for said material in its bottom and a yoke mounted on said receiver, of a measuring shell or cylinder arranged
 50 within the receiver, a plunger arranged within the shell or cylinder, a reciprocating plunger-rod supporting the plunger at its lower end and provided near its upper end with a cross-head which is guided on the yoke, a screw-threaded adjusting-sleeve surrounding the
 55 plunger-rod above said cross-head and adapted to regulate the upward movement of the plunger, a reciprocating supporting-sleeve surrounding the plunger-rod and connected

with its lower end to the measuring shell or cylinder, and cams whereby the plunger-rod and supporting-sleeve are operated substantially as set forth.

4. The combination with a receiver adapted to receive the material to be packed and having a discharge for said material in its bottom and a bearing in its top, of a tubular shaft journaled in said bearing and provided at its lower end with stirrers arranged within said receiver, a reciprocating supporting-sleeve arranged in the tubular shaft and provided at its lower end with a measuring shell or cylinder arranged within the receiver, a reciprocating plunger-rod arranged in said supporting-sleeve and provided at its lower end with a plunger arranged within said measuring shell or cylinder, and means for operating said shaft, sleeve and rod, substantially as set forth.

5. The combination with a receiver which is adapted to receive the material to be packed and which has in its bottom a discharge-nozzle and a valve controlling said nozzle, of a can-guide provided with a lifting device whereby the cans are elevated to said discharge-nozzle, a horizontal rock-lever having its front arm engaging with said lifting device, an upright rock-lever having its lower arm engaging with the rear arm of said horizontal rock-lever and its upper arm engaging with said valve, and means for rocking said upright lever, substantially as set forth.

6. The combination with a can-filling machine having a shaft from which the filling mechanism is actuated, and the driving-shaft of a cooking apparatus which delivers the material to the filling-machine, of a variable-speed gear which connects the shaft of the cooking apparatus with the filler-shaft and whereby the speed of the filling mechanism can be increased or reduced, substantially as set forth.

7. The combination with a can-filling machine having a shaft from which the filling mechanism is actuated and the driving-shaft of a cooking apparatus which delivers the material to the filling-machine, of a friction-wheel mounted on said filler-shaft, an intermediate shaft geared with the cooker-shaft and extending diametrically across the face of the friction-wheel, a friction-roller mounted on said intermediate shaft and engaging with the face of the friction-wheel, and an adjusting-screw and screw-nut connected with said friction-roller, substantially as set forth.

Witness my hand this 23d day of December, 1895.

CHARLES E. BARBER.

Witnesses:

J. WILLIAM WILSON,
 LEWIS P. SMITH.