(No Model.) 9 Sheets—Sheet 1.

J. R. ROWLAND & J. F. HELM.

CAN FILLING MACHINE.

No. 500,155. Patented June 27, 1893.

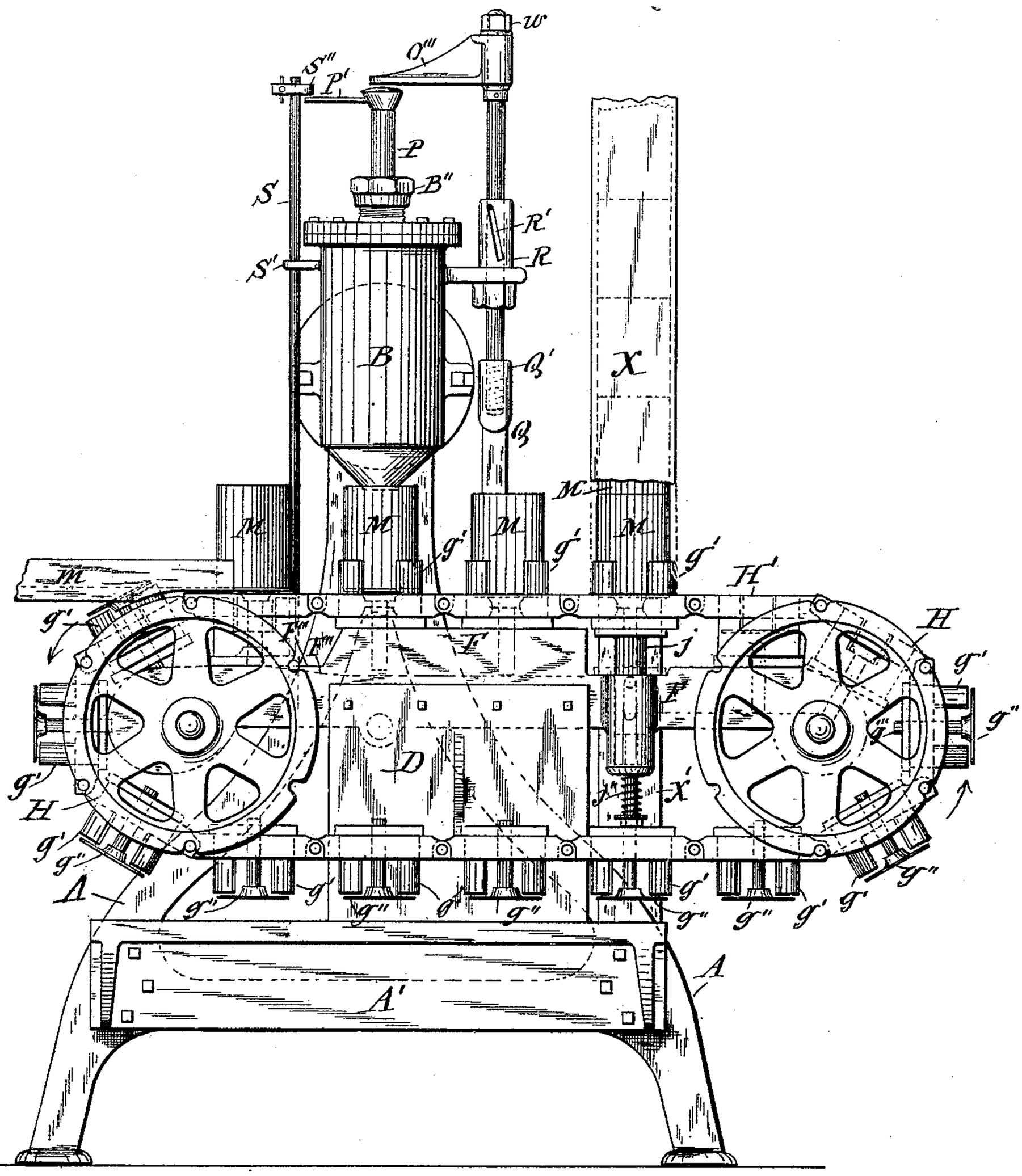


Fig. 1

WITNESSES:
J. J. Laasz
Mark W. Dewey

INVENTORS:
John R. Rowland
and John F. Helm
By Hardy Laas & Dodd
their ATTORNEYS.

(No Model.) 9 Sheets—Sheet 2.

J. R. ROWLAND & J. F. HELM.

CAN FILLING MACHINE.

No. 500,155. Patented June 27, 1893.

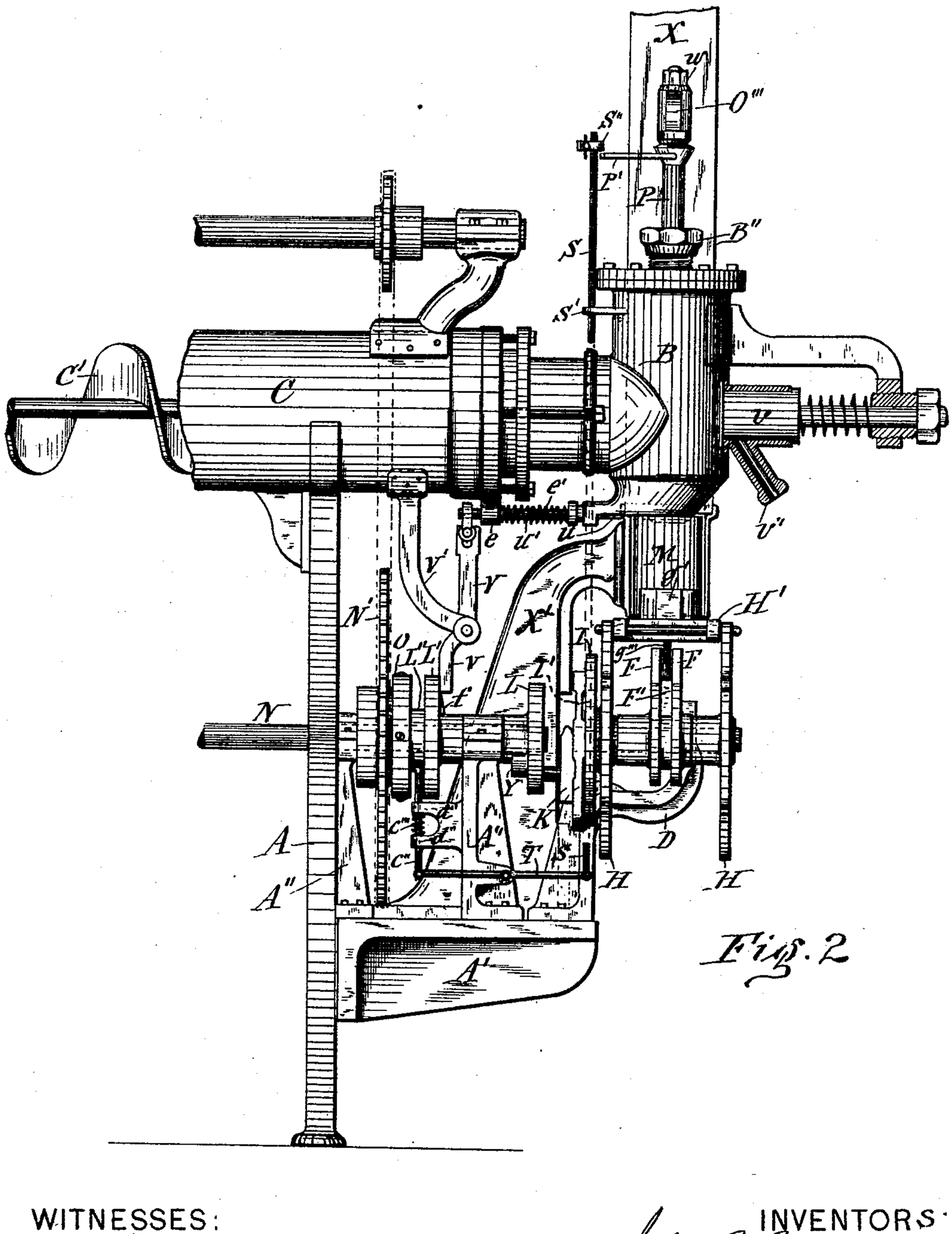


Fig. 2

WITNESSES:
J. J. Laasz
Mark W. Dewey

INVENTORS:
John R. Rowland
and John F. Helm
By Church, Laasz & Church
their ATTORNEYS

(No Model.) 9 Sheets—Sheet 3.

J. R. ROWLAND & J. F. HELM.

CAN FILLING MACHINE.

No. 500,155. Patented June 27, 1893.

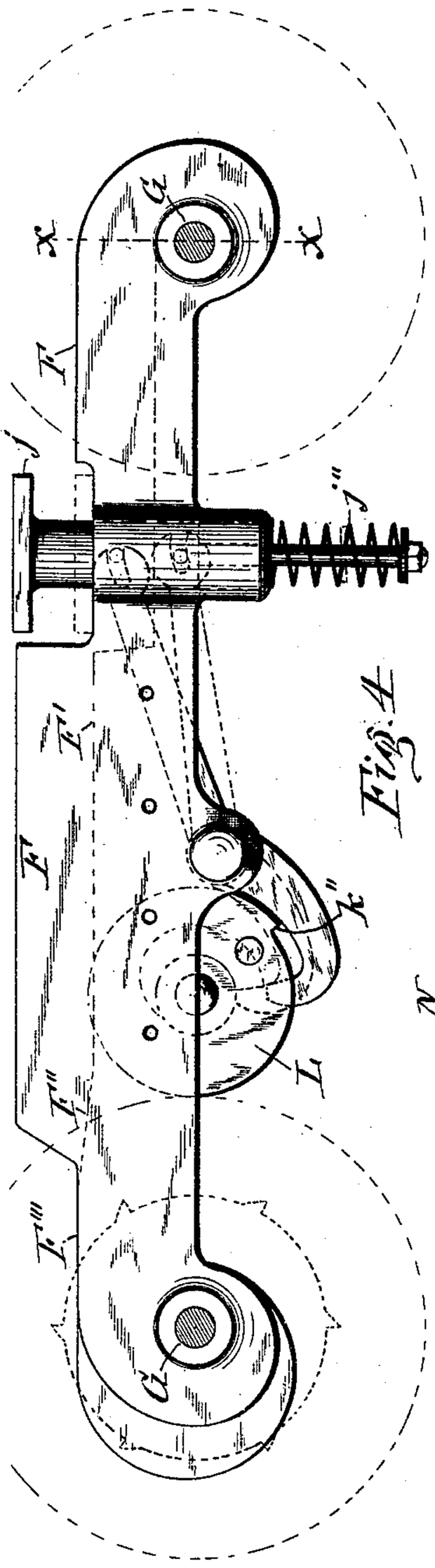


Fig. 4

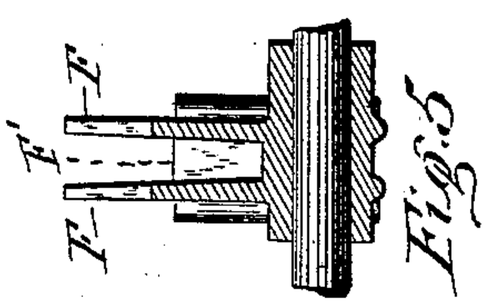


Fig. 5

Fig. 3

WITNESSES:

J. J. Laass

Mark W. Dewey

INVENTORS:

John R. Rowland

and John F. Helm

By Church, Laass & Church

their ATTORNEYS.

(No Model.) 9 Sheets—Sheet 4.

J. R. ROWLAND & J. F. HELM.

CAN FILLING MACHINE.

No. 500,155. Patented June 27, 1893.

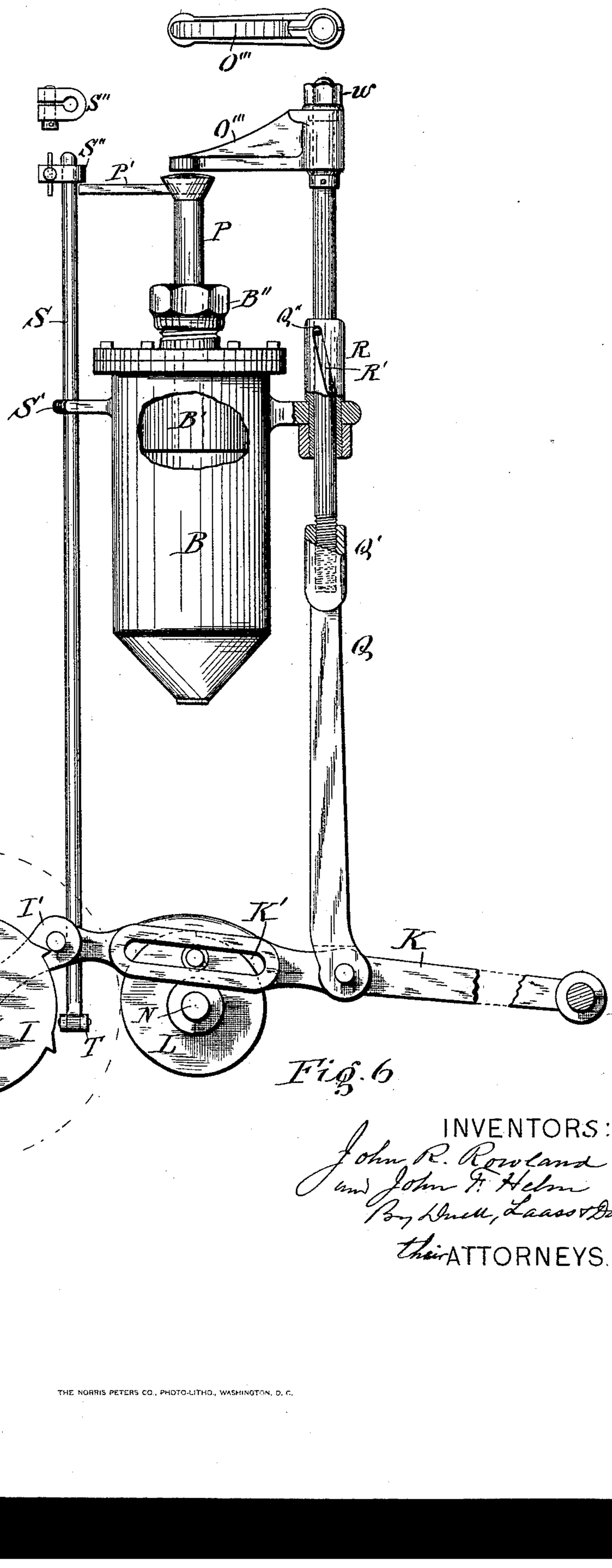


Fig. 6

WITNESSES:
J. J. Laass
Mark W. Dewey

INVENTORS:
John R. Rowland
and John F. Helm
By Duell, Laass & Dunn
their ATTORNEYS.

(No Model.) 9 Sheets—Sheet 5.

J. R. ROWLAND & J. F. HELM.

CAN FILLING MACHINE.

No. 500,155. Patented June 27, 1893.

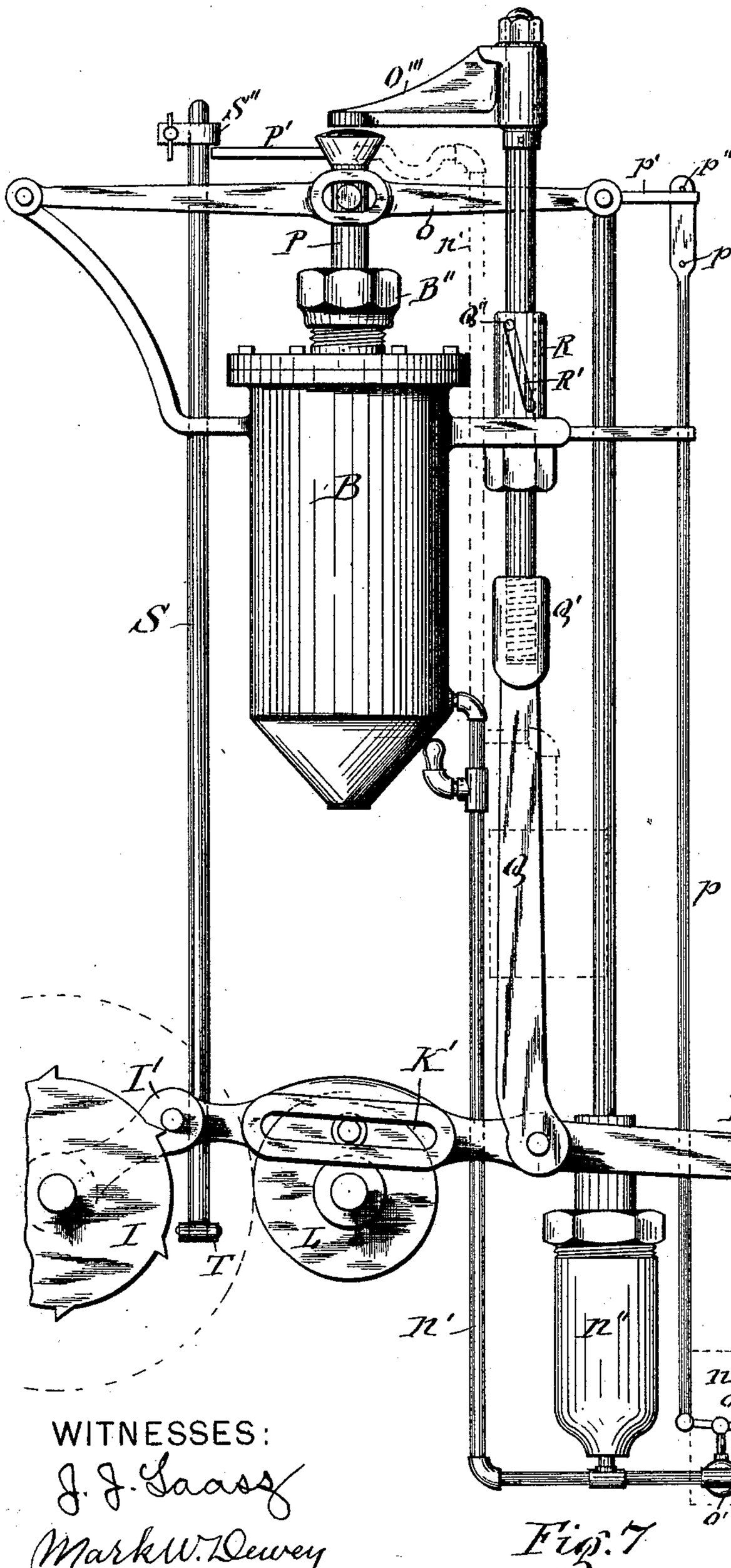


Fig. 7

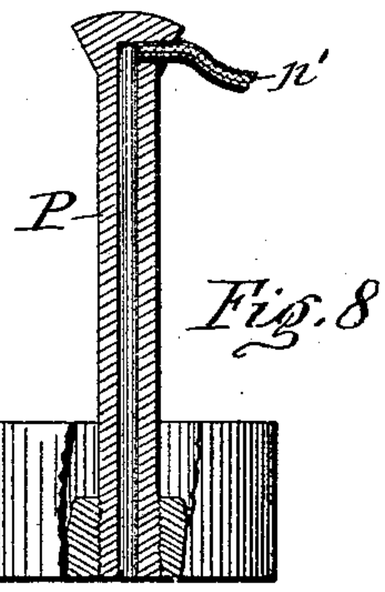


Fig. 8

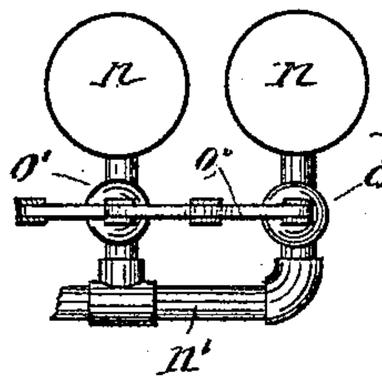


Fig. 9

WITNESSES:

J. J. Laass

Mark W. Dewey

INVENTORS:

John R. Rowland

and John F. Helm

By Duell, Laass & Duell

their ATTORNEYS.

(No Model.) 9 Sheets—Sheet 6.

J. R. ROWLAND & J. F. HELM.

CAN FILLING MACHINE.

No. 500,155. Patented June 27, 1893.

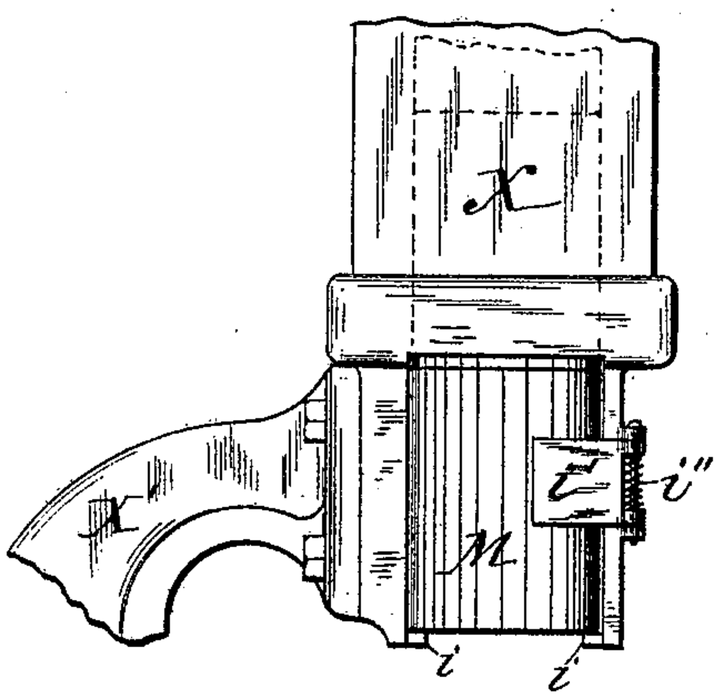


Fig. 11

Fig. 10

WITNESSES:
J. J. Saass
Mark W. Dewey

INVENTORS:
John R. Rowland
and John F. Helm
By Dodd, Lucas & Dodd
their ATTORNEYS.

(No Model.) 9 Sheets—Sheet 7.

J. R. ROWLAND & J. F. HELM.

CAN FILLING MACHINE.

No. 500,155. Patented June 27, 1893.

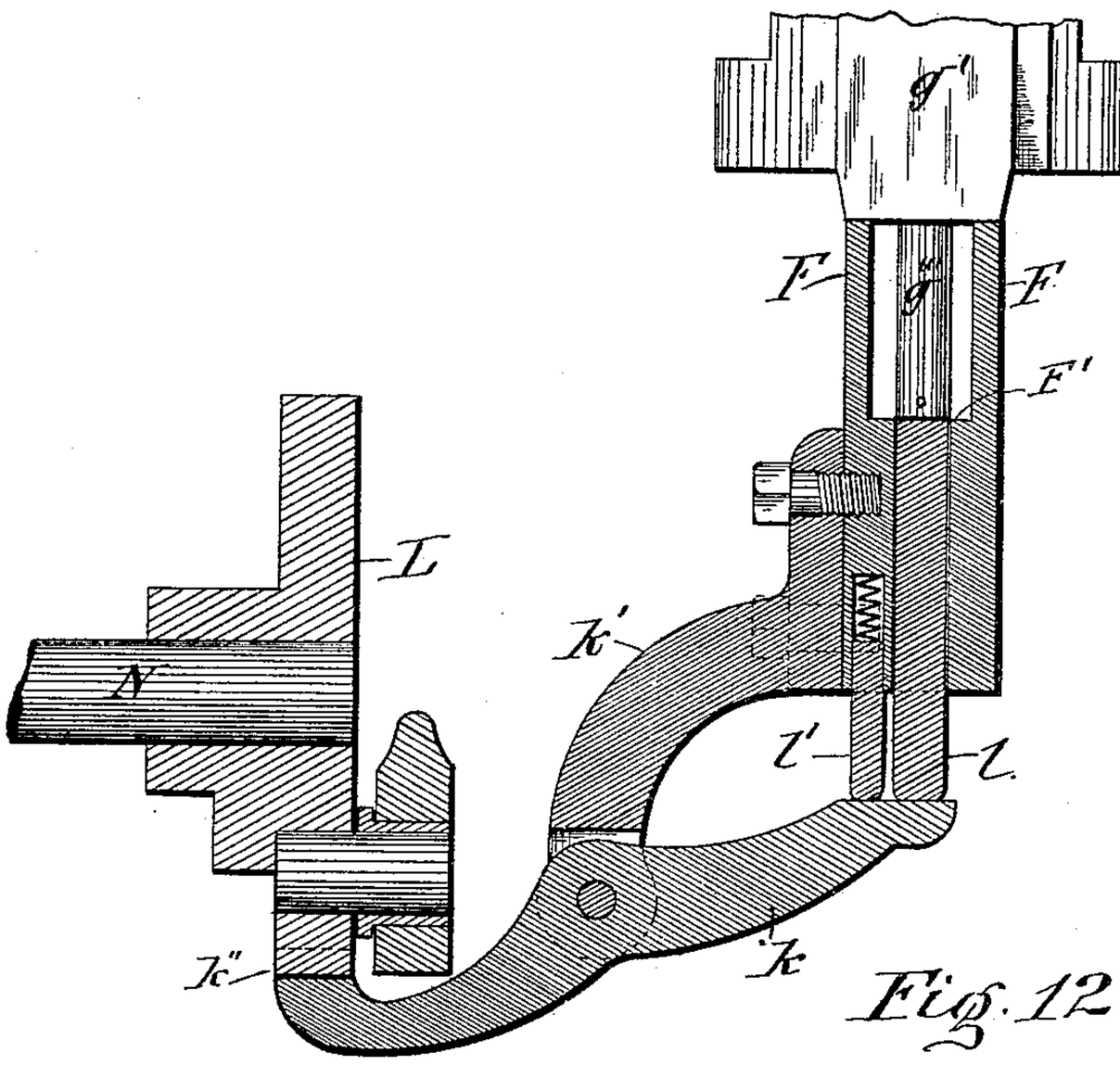


Fig. 12

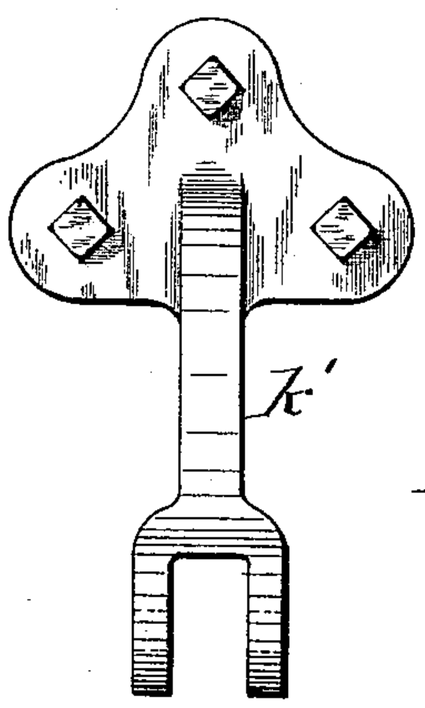


Fig. 14

Fig. 13

WITNESSES:
J. J. Laass
Mark W. Dewey

INVENTORS:
John R. Rowland
and John F. Helm
By Dewey Laass & Dewey
ATTORNEYS.

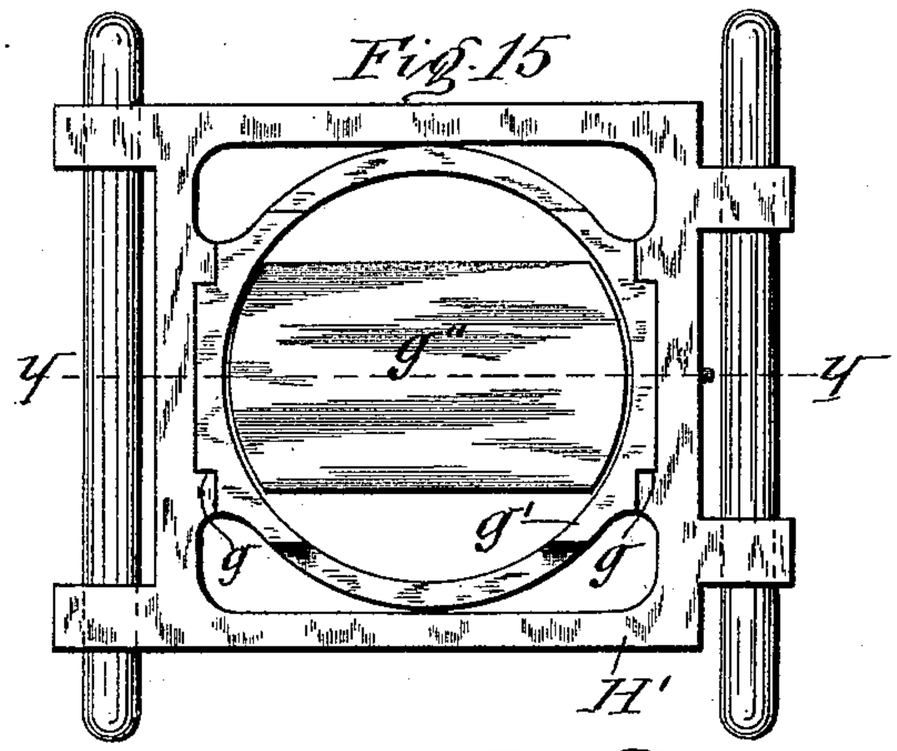
(No Model.) 9 Sheets—Sheet 8.

J. R. ROWLAND & J. F. HELM.

CAN FILLING MACHINE.

No. 500,155. Patented June 27, 1893.

Fig. 15



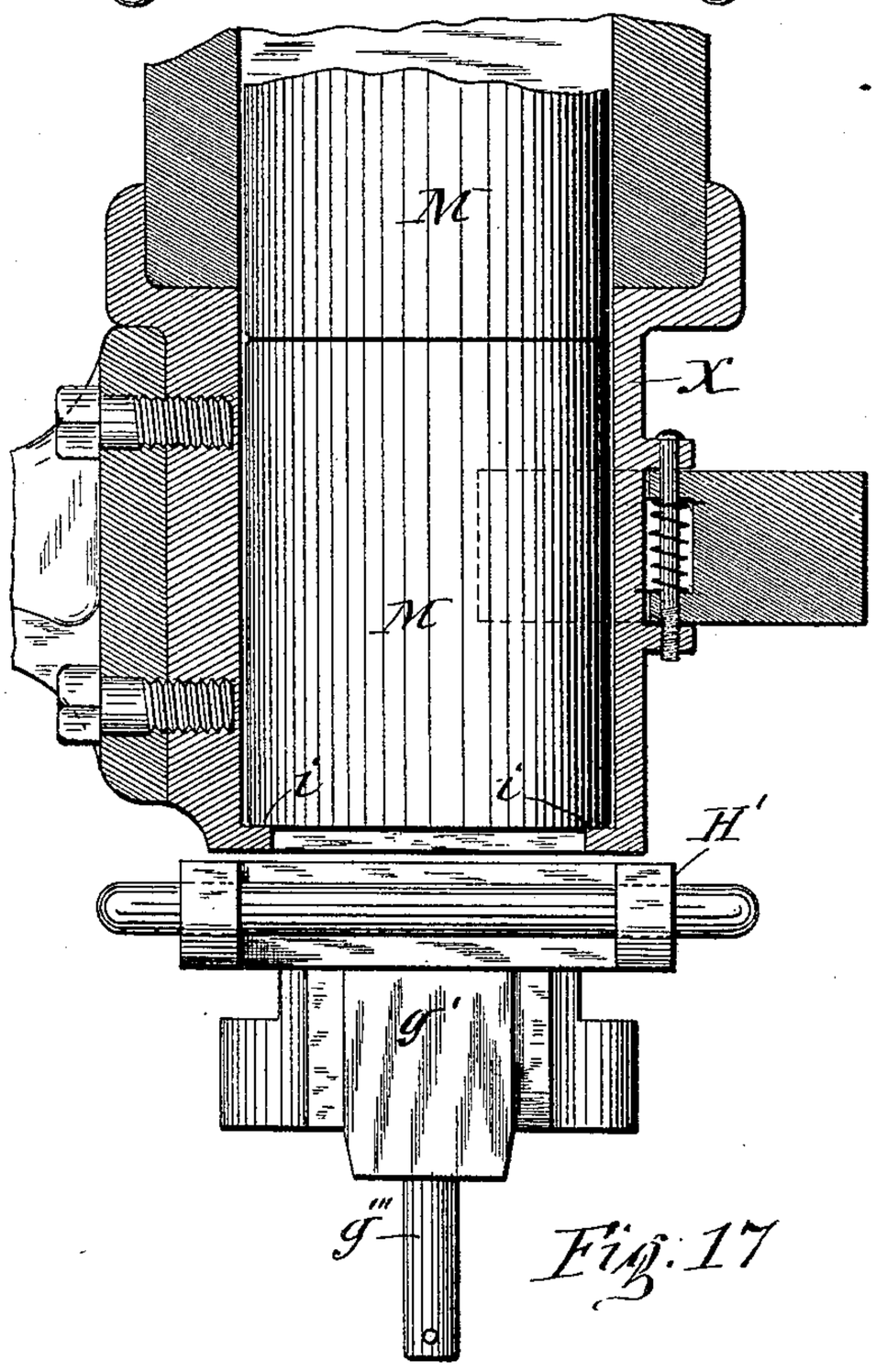
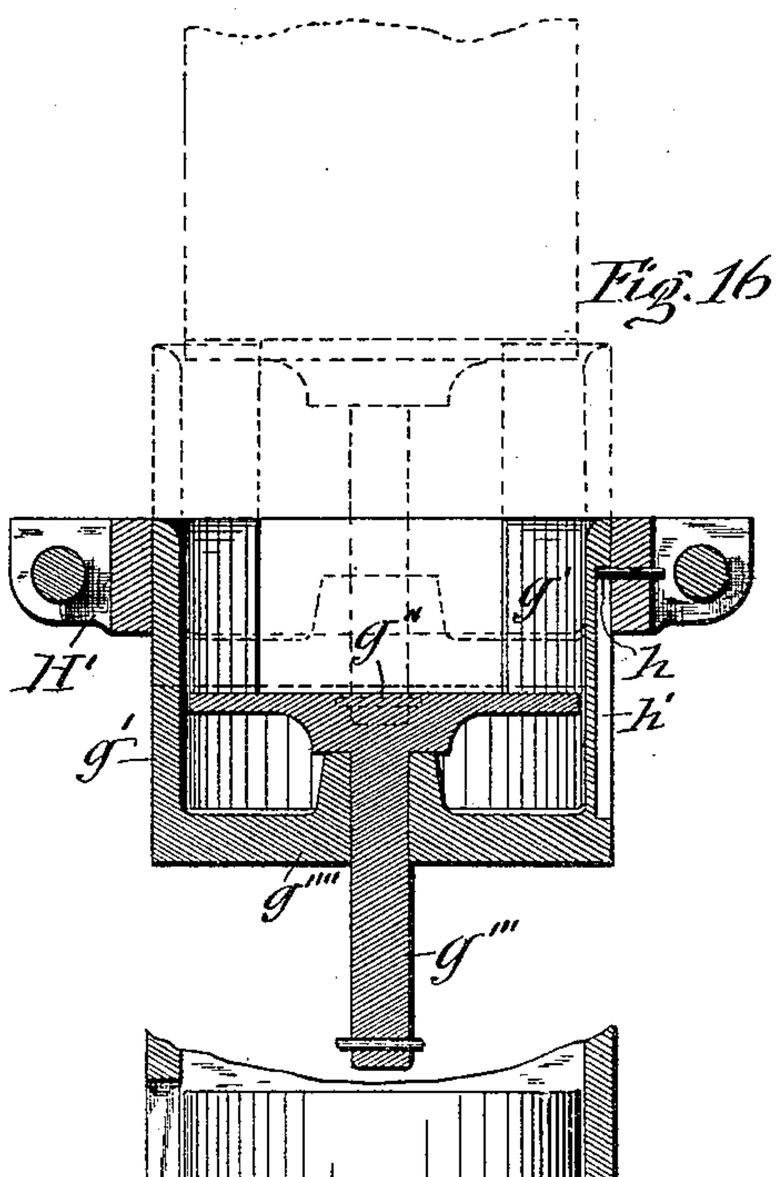


Fig. 17

Fig. 16



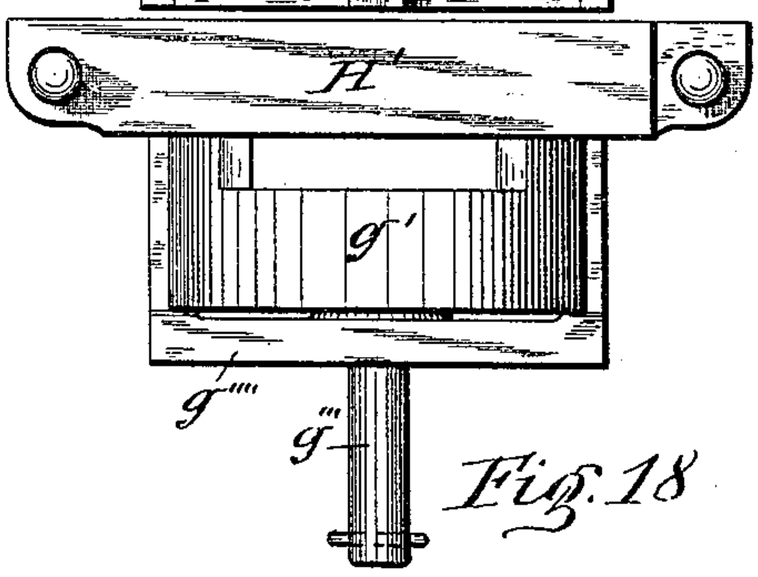


Fig. 18

WITNESSES:

J. J. Laass

Mark W. Dewey

INVENTORS:

John R. Rowland

and John F. Helm

By Church, Laass & Dewey.

Their ATTORNEYS.

(No Model.) 9 Sheets—Sheet 9.

J. R. ROWLAND & J. F. HELM.

CAN FILLING MACHINE.

No. 500,155. Patented June 27, 1893.

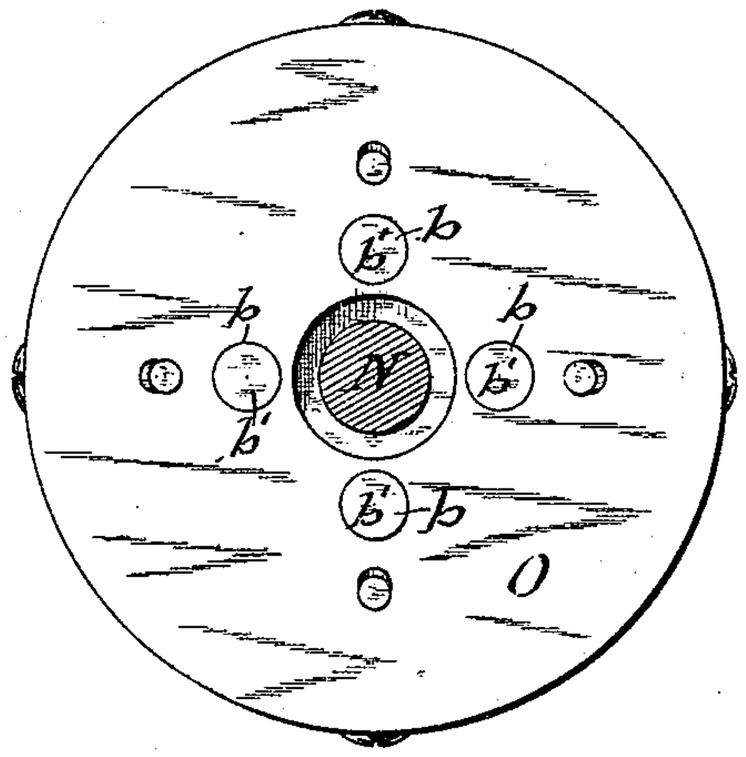


Fig. 20

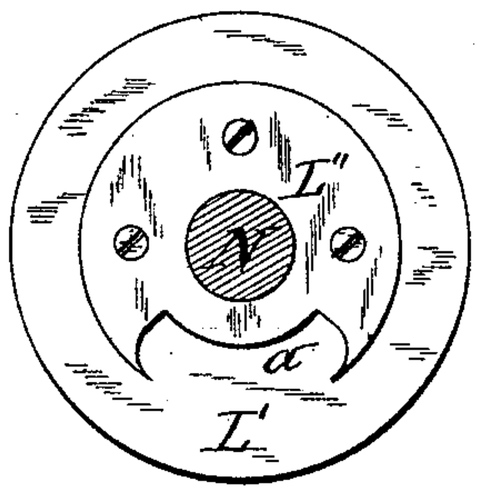


Fig. 21

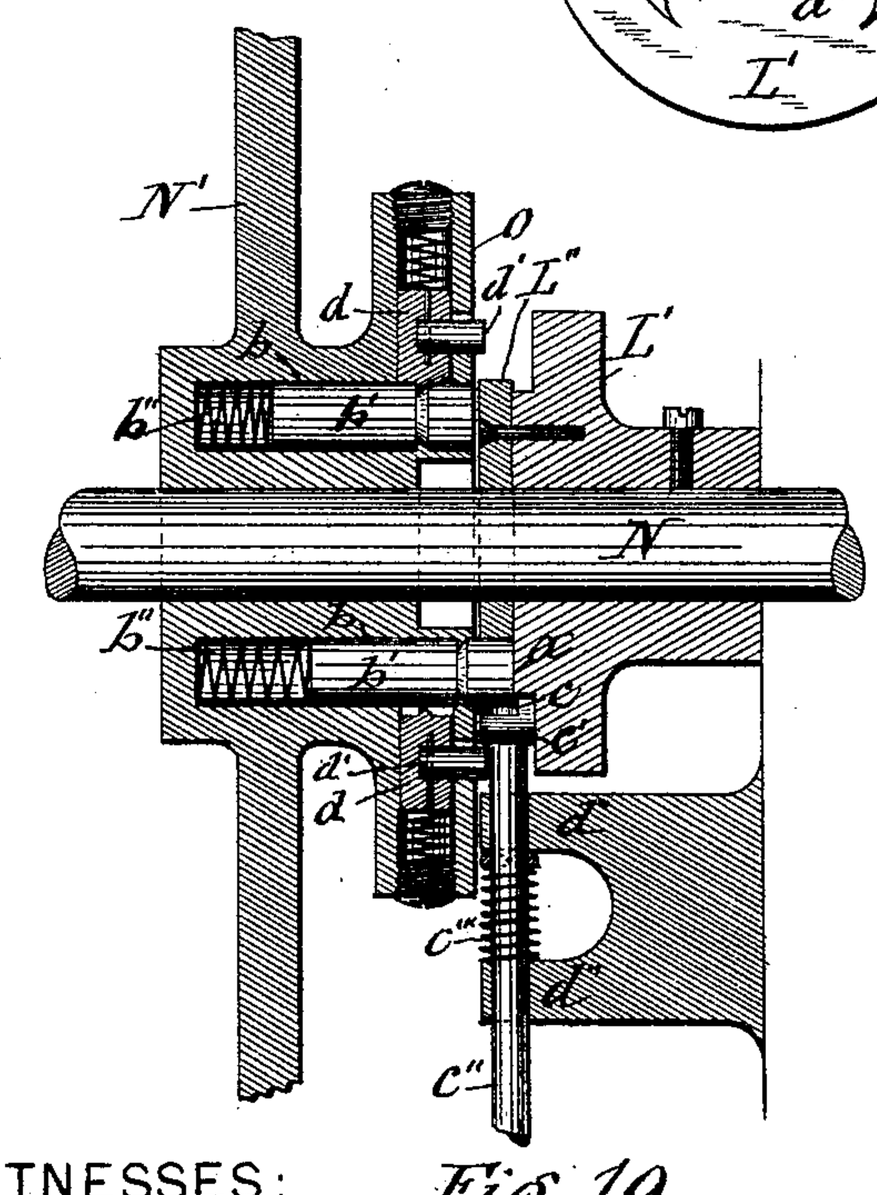


Fig. 19

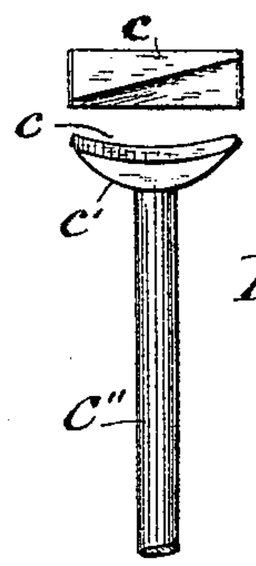


Fig. 22

WITNESSES:
J. J. Saass
Mark W. Dewey

INVENTORS:
John R. Rowland
and John F. Helm
By Dodd, Laass & Dodd
their ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN R. ROWLAND AND JOHN F. HELM, OF SYRACUSE, NEW YORK, ASSIGNORS TO THE HEMINGWAY MANUFACTURING COMPANY, OF SAME PLACE.

CAN-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 500,155, dated June 27, 1893.

Application filed June 11, 1892. Serial No. 436,344. (No model.)

To all whom it may concern:

Be it known that we, JOHN R. ROWLAND and JOHN F. HELM, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Can-Filling Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention consists in a novel organization of a machine the action of which is controlled automatically by the condition of the corn in process of being canned, and which machine embodies many features of novelty in the construction and combination of its component parts as hereinafter fully described and summed up in the claims.

In the annexed drawings Figure 1 is a side elevation of a canning machine embodying our invention. Fig. 2 is an end elevation of the same. Fig. 3 is an enlarged plan view chiefly of the frame and levers and mechanism connected directly to said levers. Fig. 4 is an enlarged detached side view of the tracks upon which the can holders ride. Fig. 5 is a transverse section on line *x*, *x*, in Fig. 4. Fig. 6 is an enlarged elevation of the filler and mechanism for operating the same, and showing also detached plan views of the arm which depresses the plunger of the filler, and the collar of the regulating rod. Fig. 7 illustrates the apparatus for automatically supplying the sirup to the corn. Fig. 8 is a longitudinal section of the plunger as constructed for conducting the sirup into the filler. Fig. 9 is an enlarged plan view of the receptacles of the sirup and their connection with the feed-pipe. Fig. 10 is an enlarged longitudinal section of the can-chute and the devices for removing the cans from the chute. Fig. 11 is a front view of the lower end of the can-chute. Fig. 12 is a vertical transverse section of the devices for lifting the can up to the filler. Figs. 13 and 14 are detail views of the lever of said lifting devices and of the bracket to which said lever is pivoted. Fig. 15 is a plan view of one of the links of the can-conveying chain, and can-holder connected thereto. Fig. 16 is a transverse section on line *y*, *y*, in Fig. 15. Fig. 17 is an enlarged vertical transverse section of the lower end portion of the can-chute and end view of one of the links of the can-conveying chain and can-holder connected thereto. Fig. 18 is a side view of the same. Fig. 19 is a horizontal section of the clutch. Figs. 20 and 21 are views of the opposing faces of the clutch; and Fig. 22 shows a side and an end view of the duplex cam used in connection with the clutch.

Similar letters of reference indicate corresponding parts.

A— represents the frame which supports one end of the cooking cylinder —C. Said cylinder is of the usual and well known construction and has the filler —B— attached to delivering end of the cylinder.

The usual spiral conveyer —C′— in the cooking cylinder carries the cooked corn to the filler —B— from whence it is forced into the cans as hereinafter described.

To the frame —A— is firmly attached a horizontal bracket —A′— on which are mounted the standards —A″—A″— provided with pillow-blocks in which the driving shaft —N— is supported. From the bracket —A′— also rises the brace —D—, to the upper end of which are rigidly secured the parallel double track —F—F— and intervening track —F′— consisting of beams constructed as hereinafter described and terminated with horizontal transverse journal-bearings —G— G— in which are mounted the shafts of sprocket wheels —H—H— arranged at opposite sides of the track beams and carrying a sprocket-chain —H′— which is of a peculiar construction as hereinafter described, to serve as a conveyer of the cans during the process of filling the same. The sprocket-wheels are rotated intermittently in the direction indicated by arrows in Fig. 1 of the drawings, and their motion is regulated and timed automatically in accordance with the time required to fill each can. This transmission of time-regulated motion is effected by the following mechanisms: To the shaft of one of the sprocket-wheels —H— is fastened a ratchet-wheel —I—, and on the same shaft is fulcrumed a rock-arm —I′— to one end of which is connected a pawl —I″— engaging the afore-

said ratchet-wheel. To the other end of the aforesaid rock-arm is connected one end of a lever —K—which is pivoted at the opposite end to the shaft of the second sprocket wheel —H. This lever receives an intermittent-oscillating motion in a vertical plane from a wheel —L— mounted rigidly on the horizontal driving shaft —N— and having a wrist-pin projecting from it and into a longitudinal slot —K'— in the lever —K. To the shaft —N— is also fastened a collar —L'— to the end face of which is secured a disk —L''— which is provided with a socket —*a*— in its face. Opposite this face of said disk is a collar —O— formed on the end of the hub of the driving wheel —N'— which is mounted loosely on the shaft —N. The collar —O— is provided with longitudinal channels —*b*— *b*— extending from the face of the collar partway toward the opposite end thereof as shown in Fig. 19 of the drawings. In the channels —*b*—*b*— are seated longitudinally movable clutch-bolts —*b'*—*b'*— backed by spiral springs —*b''*—*b''*— which force the bolts outward, said clutch-bolts being the same distance from the center of the shaft —N— as the socket —*a*—, and of a smaller diameter than said socket to allow said bolts to enter the socket when brought in range therewith, thus forming a clutch which compels the wheel —L— to rotate with the driving-wheel —N'. For throwing the said clutch out of engagement we employ a duplex cam —*c*—*c'*— formed on or affixed to the end of a rod —*c''*— which slides in stationary guides —*d*— disposed radially to the shaft —N. The side of the cam —*c*— facing toward the aforesaid shaft is curved concentric therewith, and the side of said cam adjacent to the collar —O— is beveled or wedge-shaped as shown in Fig. 19 of the drawings. The outer cam-face —*c'*— of the duplex cam is curved to a greater degree than the inner face of the cam —*c*— and forms a crescent therewith. By pushing the duplex cam radially inward the cam —*c*— is carried into the path of the outer ends of the bolts —*b'*—*b'*—, and in the rotation of the collar —O— the said beveled face of said cam bears on the end of the bolt —*b'*— in passing across it, and thereby pushes said bolt back into its seat in the collar —O. The disk —L''— is thus released from the clutch-bolts and therefore said disk and also the lever —K— are deprived of motive force and remain at rest. The clutch-bolt is retained in its retracted position by a spring-actuated catch-bolt —*d*— sliding in radial channels in the collar —O— and provided with a tooth by which it engages a groove or notch in the side of the clutch bolt —*b'*—. The catch-bolt —*d*— has a stud-pin or lug —*d'*— projecting laterally from it and, by drawing the duplex cam outward, the said lug is caused to come in contact with the outer curved face of the cam —*c'*— which pushes the catch-bolt out of engagement with the clutch-bolt, which is thus released and allowed to spring outward and into the socket —*a*— of the disk —L''— during the rotation of the collar —O. Said disk and wheel —L— are then compelled to rotate with the driving wheel —N'—, and consequently motion is transmitted to the sprocket-wheels —H—H— by the lever —K—, rock-arm —I'—, pawl —I''— and ratchet-wheel —I—hereinbefore described.

The clutch is automatically thrown out of engagement by mechanisms set in motion by the pressure of the corn contained in the filler —B— as hereinafter described, and is held normally in engagement by the duplex cam —*c*—*c'*— sustained normally in its extreme inward position by a suitable spring —*c'''*— preferably of the form of a spiral surrounding the rod —*c''*— and bearing with its outer end on one of the stationary guides of said rod, and with its inner end on a collar secured to the rod. The cam is thus in position to push the clutch-bolts back and thereby leave the lever —K— and sprocket-wheels —H—H— and their connections at rest. The filler —B— is provided in its interior with a follower —B'— to which is attached the upwardly extending plunger —P— which passes through a stuffing box —B''— connected to the cover of the filler.

To the lever —K— is connected a rod—Q— which extends upward along the side of the exterior of the filler and is composed of two parts joined end to end by a swivel —Q'— which in this case is represented in the form of a screw-threaded socket in the end of one section of the rod, and a screw-threaded portion on the adjacent end of the other section of the rod which is screwed loosely into the aforesaid socket. The upper section of the rod —Q— is cylindrical and passes through a cylindrical guide —R— secured to the side of the filler. This guide is provided with an oblique longitudinal slot —R'— and to the cylindrical section of the rod —Q— is affixed a lug —Q''— which projects into said slot, for the purpose hereinafter explained. To the upper end of the rod —Q— is secured a laterally extending arm —Q'''— the free end of which is adapted to bear upon the top of the plunger —P. When the lever —K— is oscillated as hereinbefore described the rod —Q— receives a longitudinal reciprocating motion and is at the same time partially rotated by the sliding of the lug —Q''— in the oblique slot —R'— of the guide —R—, and by this latter movement the arm —Q'''— is carried to and from its position over the top of the plunger. The slot —R'— is at such an angle in relation to the axis of the rod —Q— as to cause the arm —Q'''— to be swung to a position directly over the top of the plunger —P— when the rod —Q— is at its elevated position. In the downward movement of said rod the arm —Q'''— pushes down the plunger —P— and is gradually swung off from the plunger and releases the same from pressure when depressed to the predetermined degree. By means of said

plunger we automatically control and time the movement of the mechanism of the entire can-filling machine. For this purpose we affix to the plunger —P— a laterally extending arm —P′—, and along the side of the exterior of the filler —B— we place the vertical regulating rod —S— which slides in a guide —S′— projecting from the exterior of the filler. The upper end of said rod is provided with a shoulder or collar —S″— in such a position as to cause the arm —P′— to come in contact with the under side of the collar when the plunger —P— is near its elevated position, said regulating rod is thus drawn upward by the plunger in the last portion of the upward movement. The lower end of the rod —S— is connected to one end of a lever —T— which is pivoted intermediate of its length to one of the standards —A″. To the opposite end of said lever is connected the rod —*c*″— of the duplex cam —*c*—*c*′— which controls the action of the clutch by which the mechanism of the machine derives its motion from the main driving shaft —N— as hereinbefore described. In the upward draft of the regulating rod —S— by the plunger —P— the rod —*c*″— with the duplex cam —*c*—*c*′— is drawn down. This removes the beveled cam-face —*c*— from in front of the ends of the clutch-bolts —*b*′— and at the same time the curved cam-face —*c*— is brought to bear on the inner sides of the lugs —*d*′— of the catch-bolts —*d*— during the rotation of the collar —O— and thus one of the clutch-bolts is allowed to enter the socket —*a*— of the disk —L″— which then rotates with the driving shaft —N— and imparts motion to the mechanisms of the machine. Inasmuch as the clutch is held normally out of connection with the actuating mechanism of the machine the latter is held normally at rest.

In starting the machine the conveyer of the cooking-cylinder —C— forces the cooked corn into the filler —B—, the discharge opening of which is closed at that time, and, as the filler becomes charged with the corn, the follower of said filler is forced upward by the pressure of the corn underneath it. The plunger —P— moving with the follower causes the arm —P′— of the plunger to lift the regulating rod —S— when the filler is charged with the predetermined amount of corn. Said lifting of the rod —*s*— causes the before described duplex cam to release the clutch which then engages the disk —L″— and thereby sets the machine in motion and causes the lever —K— to depress the plunger and force the corn from the filler —B— out through the discharge opening thereof, which by that time is opened by automatically operated devices as hereinafter described.

It is found in practice that at different times of the canning season the corn varies in density or in the amount of milk contained therein and consequently requires different degrees of pressure to force the corn from the filler and properly fill the cans. For that reason we render the before described regulating mechanism adjustable to impart a greater or less pressure to the plunger —P. This we accomplish by connecting the collar —S″— to the rod —S— adjustable longitudinally in relation to the latter so as to allow said collar to be set at a greater or less elevation on the rod. The collar may be fastened in its adjusted position either by a set-screw passing transversely through the collar and bearing with its inner end on the side of the rod in the usual and well known manner, or by splitting the collar longitudinally and providing it with perforated ears for the reception of a bolt by which the collar is clamped onto the rod as represented in Fig. 6 of the drawings. By lowering the aforesaid collar on the rod —S— the clutch which controls the movement of the machine, is actuated by a shorter upward movement of the plunger and therefore the latter is permitted a shorter stroke, and the movement of the can filling machine is accelerated.

To the bottom of the filler —B— is connected a gate —U— which is movable across the discharge opening of the filler so as to open and close the same. This gate is operated automatically by means of a two-armed lever —V— pivoted to a suitable support, which in this case is of the form of a hanger —V′— attached to the cooking cylinder —C. One arm of said lever is connected to the gate by a rod —U′— which passes through a perforated ear —*e*— fixed to the cooking chamber. A spiral spring —*e*′— surrounding said rod between the said ear and gate and pressing with opposite ends against said ear and a shoulder on the gate forces said gate to its closed position and at the same time holds the other arm of the lever —V— in the path of the cam —*f*— on the collar —L′. The collar, when rotated, causes the cam —*f*— to actuate the lever —V— so as to draw the gate —U— into its open position. The cam —*f*— is in such a position as to cause the gate to be opened while the lever —K— depresses the plunger —P— by means of the rod —Q— and arm —Q‴— connected thereto.

The sprocket-chain or can-conveyer —H′— and can-holder are constructed as follows, to wit: The links of the said chain are each formed with vertical guides —*g*— in which slides the body of the can-holder —*g*′—, the vertical movement of which is limited by a suitable stop, such as a pin —*h*— passing horizontally through the link and projecting into a vertical groove —*h*′— in the side of the body of the can-holder as shown in Fig. 16 of the drawings. The body of said can-holder is of the form of a mutilated cup having only front and rear walls and the portions of its walls adjacent to the sides of the link cut away, and its bottom —*g*″— movable vertically and provided with a downwardly-extending stem —*g*‴— which passes through an eye in a cross-bar —*g*⁗— on the bottom of the body of the holder. X— represents the

can-chute sustained vertically over the conveyer or chain —H'— by an arm —X'— rising from the bracket —A'. This chute is provided with an opening in the rear for the passage of the can-holders —*g'*— the vertical walls of which are considerably lower than the height of the cans. The front of the chute —X— is provided with an opening of a sufficient height to allow the cans to pass forward from under the chute. The base of the can-chute is provided with shoulders —*i*—*i*— on opposite sides to support the tier of empty cans —M— in the chute above the passage of the can-holders —*g'*— carried on the conveyer or chain —H'— in the travel of the said can-holders toward the chute. Beneath the chain —H'— and axially in line with the can-chute is a vertically movable piston —*j*— provided with a central slot —*j'*— for the passage of the stem —*g'''*— of the can-holder carried along by the chain —H'. The bodies of the can-holders slide upon the tracks —F—F— while the vertically movable bottoms —*g''*— of said holders rest upon the cross-bar —*g''''*— and the stem —*g'''*— slides with its lower end upon the track —F'. The portions of the aforesaid tracks back of the can-chute are in planes sufficiently lower than the base of the can-chute to allow the can-holders to pass under the chute and upon the top of the piston —*j*— which is held normally in the same plane with the depressed portions of the tracks —F—F— by means of a suitable spring —*j''*— represented in the form of a spiral surrounding a downwardly-extending stem of the piston and bearing with opposite ends respectively on the under side of the tracks and top of a collar attached to the lower end of the stem. A rock-shaft —J—disposed at right angles to the tracks —F— is mounted in suitable bearings on the said tracks and on one of the standards —A''— and has extending laterally from it two arms —J'— —J'', one of which is connected with a lug projecting from the side of the piston—*j*—, and the other arm rides upon a cam —Y— secured to the side of the wheel —L— and thus rotating synchronously with the same. The rotation of said cam imparts an oscillatory motion to the arms —J'—J''— and causes the piston —*j*— to be lifted from the tracks —F—F. The body of the can-holder —*g'*— riding on said piston is thereby elevated sufficiently to take hold of the bottom portion of the can resting on the shoulder —*i*—*i*— on the bottom of the can-chute. The portions of the tracks —F—F— in front of said chute are in the same plane with the top of the elevated piston to allow the can-holder to slide horizontally from the top of the piston onto the aforesaid tracks. The can received in the holder —*g'*— is carried out from under the can-chute by the travel of the chain —H'—, and the tier of cans left in the chute drop onto the shoulders —*i*—*i*— which support said cans in position to allow the lowest of said cans to be removed by the succeeding holder —*g'*— as before described. In order to guard against the tilting of the lower can in its descent in the chute we pivot to the side of the chute a wing —*i'*— which is sustained normally across the front opening of the chute by a spring —*i''*. The chain —H'— with its can-holders —*g'*— carry the cans from the chute —X— to the filler —B— which is supported at a proper elevation to allow the cans to pass under the discharge opening of the filler. The motion of the mechanisms of the machine is so regulated and timed as to hold the chain —H'— temporarily at rest when one of the cans is brought to a position in which the opening in the top of the can registers with the discharge-opening of the filler. To lift the can so as to cause the discharge spout of the filler to enter and fit tightly in the opening in the top of the can during the process of filling the same we employ a lever —*k*— which is pivoted intermediate of its length to a suitable support, such as a bracket —*k'*— attached to the track —F— as shown in Fig. 12 of the drawings. One end of the lever —*k*— bears on the periphery of the wheel —L— a portion of which is formed eccentric, the eccentricity being sufficient to cause the lever to lift the can the required distance as aforesaid and terminates abruptly as shown at —*k''*— in Fig. 4 of the drawings so as to allow the can-holder to drop quickly at the proper time. The opposite end of the lever —*k*— is extended under the tracks —F —F— and supports a push-pin —*l*— sliding vertically in a channel extending through the central track —F'— as illustrated in Fig. 12 of the drawings. In another vertical channel in the bottom of one of the tracks —F— slides a pin —*l'*— backed by a spring which causes said pin to press down the subjacent end of the lever and thus maintain the opposite end of said lever in contact with the periphery of the wheel —L—. The lever receives thereby a slight intermittent oscillatory motion which causes the push-pin —*l*— to push up the vertically movable bottom of the can-holder by means of the stem —*g'''*—. The can resting on said bottom is thus pushed up so as to cause the discharge-spout of the filler to fit tightly in the opening in the top of the can. Inasmuch as the aforesaid eccentric is on the wheel —L— it obviously operates synchronously with said wheel. Simultaneously with the lifting of the can as aforesaid, the wrist-pin on the revolving wheel —L— carries down the lever —K— which moves the lever —I'— so as to release the ratchet-wheel —I— and thus the conveyer or chain —H'— is deprived of motion and the cans remain at rest while the lever —K— draws down the rod —Q— which by means of the arm —Q'''— depresses the plunger —P— and thereby forces the corn from the filler into the can. By the time the can is filled the eccentric portion of the wheel —L— moves away from the lever —*k*— which then allows the filled can to descend suffi-

ciently to pass forward from under the filler in which direction it is carried by the chain —H'— which is set in motion at the proper time by the mechanisms hereinbefore described. From thence on the central track —F'— is made ascending as indicated by the dotted lines —F''— and the tracks —F—F— are formed with the depression —F'''— as shown in Figs. 1 and 4 of the drawings. The stem —*g'''*— of the can-holder sliding with its end on the said ascending track causes the bottom —*g''*— of the can-holder to be lifted while the body of said holder drops onto the depressed portion of the tracks —F—F—. By this operation the can is released from the holder and delivered onto the table —*m*.

In connection with the described automatic can-filling machine, we prefer to employ an automatic siruping apparatus for adding the requisite amount of sirup to the corn in process of being canned. This part of our invention is illustrated in Fig. 7 of the drawings, in which —*n*—*n*— represent receptacles of sirup of different strengths. Each of said receptacles is connected by a separate pipe to a pipe —*n'*— which communicates with either the interior of the filler or the can in transit to the filler. To the pipe —*n'*— is connected the pump —*n''*—, the plunger-rod of which is connected to the end of a lever —*o*— which extends across the plunger —P— of the filler and is pivotally connected thereto and has its opposite end pivoted to a bracket attached to the filler or to some other suitable support. The pump is thus operated by the plunger —P— of the filler. The pipe —*n'*— may be connected either to the lower portion of the filler as shown by full lines, or to the plunger —P— as represented by dotted lines, in which latter case the pipe —*n'*— must be made flexible and a channel must be formed vertically through the plunger and follower, as shown in Fig. 8 of the drawings, to allow the sirup to descend into the filler. To vary the supply of sirup of different strengths automatically and in accordance with requirements of the condition of the corn under treatment, we connect a separate valve —*o'*— to each of the pipes by which the receptacles —*n*—*n*— are connected to the pipes —*n'*—, and connect to the two valve-stems a lever —*o''*— pivoted to a post between said stems and extending beyond one of the stems. To the said extension of the lever —*o''*— is connected a vertical rod —*p*—, the upper end of which passes loosely through an arm —*p'*— extending from the lever —*o*. Above and below the said arm are pins —*p''*—*p''*— projecting from the sides of the rod —*p*— and engaged by the arm during the oscillation of the lever —*o*. The valves —*o'*—*o'*— are thus regulated by the thrust of the plunger —P— which actuates the lever —*o*. The pins —*p''*—*p''*— are a proper distance apart to afford a limited lost motion to the rod —*p*— and cause the valve of the weak sirup-receptacle to be opened when the plunger —P— is lifted to a certain degree by old corn forced into the filler, which corn requires a greater amount of sirup than new and milky corn.

We do not wish to be limited to the specific construction of the clutch by which the mechanism of the canning machine is thrown in and out of gear with the driving-shaft —N— as hereinbefore described as it is obvious that other well known forms of clutches can be made to serve the same purpose. It is also that the detail construction of the machine is susceptible of many modifications without departing from the spirit of our invention.

To guard against excessive pressure of steam on the corn delivered from the cooking cylinder to the filler, we attach to the latter a safety-valve —*v*— of any suitable and well known construction, and preferably provide said safety-valve with a spout —*v'*— for the escape of the steam, and inasmuch as more or less of the liquid is liable to escape with the steam, a hose or pipe may be extended from the spout —*v'*— to the usual hopper on the receiving end of the cooking-cylinder, or other suitable receptacle.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A can-filling machine having its actuating mechanism provided with a clutch for throwing said machine in and out of gear, and the plunger of the filler free to be lifted by the pressure of the substance entering the filler, a regulating rod actuated by said plunger in the upward movement thereof and automatically controlling the aforesaid clutch as set forth.

2. A canning machine comprising a cylinder receiving under pressure the substance to be canned and provided with a gate for controlling the egress from said cylinder, a plunger in said cylinder having an upward movement independent of the actuating mechanism of the machine and actuated in said direction by the pressure of the substance entering the aforesaid cylinder, and an arm in the path of the plunger and receiving downward motion from the actuating mechanism of the machine to depress said plunger as set forth.

3. A canning machine comprising a cylinder receiving under pressure the substance to be canned and provided with a gate for controlling the egress from said cylinder, a plunger in said cylinder, and detached from the actuating mechanism of the machine and receiving its upward movement by the pressure of the substance entering the cylinder, a vertically movable rod actuated by the aforesaid mechanism, and an arm on said rod movable to and from the path of the plunger as set forth.

4. A canning machine comprising a cylinder receiving under pressure the substance to be canned, and provided with a gate controlling the egress from said cylinder, a plunger

in the cylinder detached from the actuating mechanism of the machine and forced outward by the pressure of the substance entering the cylinder, a longitudinally movable rod parallel with the plunger, an arm on said rod movable to and from the path of the plunger, mechanism transmitting motion from the driving shaft to the aforesaid gate and rod and simultaneously opening the gate and depressing the rod, a clutch adapted to throw said mechanism in and out of gear, and a rod controlling the clutch and actuated by the plunger, as set forth.

5. In combination with the filler, an endless conveyer passing under said filler, vertically movable can-holders carried by said conveyer, tracks having portions of their lengths in different elevations and supporting the can-holders, a piston lifting the cans from the lower to the higher portions of the track, and mechanism transmitting motion from one and the same driving shaft to said conveyer and piston and actuating the same alternately and intermittently as set forth.

6. In combination with the filler, an endless conveyer passing under the filler, vertically movable can-holders carried by said conveyer, a can-chute over the conveyer at the rear of the filler, tracks supporting the can-holders and having the portion under the can-chute in a lower plane than the portion under the filler, a piston under the can-chute for lifting thereto the can-holders, and a lever operating said piston as set forth.

7. In combination with the filler, and cooker forcing the corn into said filler, the plunger being free to be raised by the pressure of the corn entering the filler, and mechanism forcing said plunger into the filler, a clutch for throwing said mechanism in and out of gear, a longitudinally movable vertical rod actuating said clutch, a collar attached to said rod longitudinally adjustable, and an arm extending from the plunger and engaging the collar, the adjustability of which permits the motion of the machine to be regulated according to the condition of the substance to be canned as set forth.

8. In combination with the filler and its discharge gate, the plunger having a free outward movement received from the substance entering the filler, actuating mechanism depressing the plunger, a clutch for throwing said mechanism in and out of gear, a lever connected to the gate and actuated by the aforesaid mechanism, and a regulating rod actuated by the plunger in its upward movement and automatically throwing the clutch in gear as set forth.

9. A canning machine comprising a driving shaft, and filler and a can-conveyer both actuated by said driving shaft intermittently and alternately by intervening mechanism, a clutch for throwing said mechanism in and out of gear, and a longitudinally movable rod receiving motion from the plunger during its ascent and automatically throwing the clutch in gear, as set forth.

10. In combination with the filler and can-chute, tracks under said parts and having depressions respectively under the can-chute and beyond the filler, sprocket-wheels pivoted to the ends of the tracks, a sprocket-chain running on said wheels, and provided with vertical guides, can-holders sliding in said guides and riding on the aforesaid tracks, and a vertically moving piston under the can-chute and lifting the can-holders to said chute as set forth.

11. In combination with the filler, stationary tracks under said filler, the can-holder riding on said tracks and provided with a vertically movable bottom carrying the can, a vertically movable push-pin under said bottom, and a lever lifting said push-pin, as set forth.

12. In combination with the filler, a parallel double track under the filler and formed with a depression beyond the same, a third track in a lower plane than the double track and ascending beyond the filler, a can receiving table at the end of said ascending track, a conveyer passing under the filler, can-holders carried by said conveyer and riding on the double track and having their bottoms movable outwardly independent of the bodies of the holders, and stems extending downward from said bottoms and riding on the third track, as and for the purpose set forth.

13. In combination with the filler, an endless conveyer passing under said filler and vertically movable can-holder on said conveyer, the can-chute disposed directly over said conveyer and provided with a can-exit at the side facing the filler, and with a lower entrance for the can-holders at the opposite side, and shoulders above the said entrance for supporting the cans in the chute, above the aforesaid entrance a vertically movable piston under the conveyer and axially in line with the can-chute, and a lever actuating said piston to lift the can-holder and cause the same to drag the can directly from the chute, substantially as described and shown.

14. In combination with the filler and conveyer passing under said filler, a can-chute directly over said conveyer and provided with passages diametrically opposite each other, and can-holders on said conveyer dragging the cans directly from under the chute as set forth.

15. In combination with the filler and can-chute, an endless conveyer passing under said filler and chute, tracks under the conveyer and formed with depressions under the can-chute, vertically movable can-holders carried by said conveyer and riding on the tracks and provided with independently vertically movable bottoms, a piston under the can-chute to lift the can-holders from the depressed portions of the tracks to the can-chute and to the elevated portions of the tracks, a

push-pin under the filler for lifting the bottom of the can holder and thereby raise the can to the discharge spout of the filler, and a lever actuating said piston and push-pin substantially as set forth and shown.

16. In combination with the filler and can-chute, a sprocket-chain passing under said filler and chute, a double track under said chain and formed with a depression under the can-chute, a central track in a plane below the double track and formed ascending beyond the filler, vertically movable can-holders mounted on said chain and riding on the double track and provided with a bottom arranged movable vertically on the body of the can-holder, a stem extending downward from said bottom and riding on the central track, a piston under the can-chute lifting the body of the can-chute and provided with a groove for the reception of the aforesaid stem, a lever actuating said piston, a push-pin under the filler pressing upward the stem of the can-holder-bottom to lift the can to the filler, and a table for receiving the filled cans at the elevated end of the central track, substantially as described and shown.

17. In combination with the conveyer or chain, and can-holders carried by said conveyer or chain, the can-chute formed with a can exit in its front and a lower entrance for the can-holders in its rear and with shoulders above said entrance for supporting the cans in the chute, and a spring-actuated wing held normally across the can-exit of the chute to guide the descending bottom can as set forth.

18. In combination with the driving shaft, filler, conveyer under said filler, tracks under said conveyer, and can-holders carried by the conveyer and provided with vertically movable bottoms, stems extending downward from said bottoms, a vertical push-pin under the tracks and axially in line with the filler, an eccentric receiving rotary motion from the driving shaft, and a lever actuated by said eccentric and lifting the aforesaid push-pin substantially as and for the purpose set forth.

19. In combination with the driving shaft, can-chute, conveyer under said chute, tracks under the conveyer and formed with a depression under the can-chute, and vertically movable can holders carried by the conveyer, a vertically movable piston under the conveyer and axially in line with the can-chute, a spring depressing the piston, a cam rotated by the driving shaft, and a lever actuated by said cam and forcing up the aforesaid piston as set forth.

20. In combination with the driving-shaft, filler, sprocket-wheels at opposite ends of the machine, a sprocket-chain running on said wheels, can-holders on said chain, and a push-pin for lifting the can to the filler, a ratchet-wheel fixed to the shaft of one of the sprocket-wheels, a pawl engaging said ratchet-wheel, a lever actuating said pawl, a lever actuating the aforesaid push-pin, a wheel receiving rotary motion from the driving shaft and imparting oscillatory motion to the pawl-actuating lever, an eccentric moving synchronously with said wheel, and a lever transmitting motion from said eccentric to the aforesaid push-pin as set forth.

21. In combination with the driving shaft, and filler, sprocket-wheels at opposite ends of the machine, a can-conveying chain mounted on said wheels, a ratchet-wheel fixed to the shaft of one of said sprocket-wheels, a rock-arm mounted on said latter shaft, a pawl connected to one end of the rock-arm and engaging the ratchet-wheel, an oscillatory lever actuating said rock-arm, a rod connected to said lever, and a plunger connected to the follower of the filler and depressed by the aforesaid rod during the release of the pawl from the aforesaid ratchet-wheel, as set forth and shown.

22. In combination with the driving shaft and filler, sprocket-wheels at opposite ends of the machine, a sprocket-chain mounted on said wheels, can-holders carried by said chain and provided with vertically movable bottoms upon which the cans rest, a vertical push-pin under the conveyer axially in line with the filler, a ratchet fixed to the shaft of one of the sprocket-wheels, a rock-arm mounted on said shaft, a wheel and eccentric receiving rotary motion from the driving shaft, a lever transmitting motion from the eccentric to the push-pin, a lever receiving oscillatory motion from the aforesaid wheel, a rod connected to said lever, and a plunger connected to the follower of the filler and depressed by said rod, all combined to receive motion from one and the same driving shaft and to be actuated intermittently and in the order herein specified.

23. In combination with the filler, a reciprocating rod extending vertically along the side of the filler and swiveled intermediate its length, a guide disposed diagonally with reference to the axis of the rod and imparting rotary motion to the upper part of said rod during the vertical movement thereof, a plunger connected to the follower of the filler, and an arm extending from the upper end of the rod and swung thereby to and from over the top of the plunger as set forth.

24. In combination with the filler having its plunger extending above the top of the filler, a vertically reciprocating rod swiveled intermediate its length, a guide secured to the side of the filler and provided with a longitudinal oblique slot, the upper part of the aforesaid rod passing through said guide and provided with a lug sliding in the oblique slot, and an arm extending laterally from the upper end of said rod and swung thereby to and from over the plunger of the filler, substantially as described and shown.

25. In combination with the filler, and its plunger, sirup-receptacles connected to a discharge pipe for supplying the sirup to the corn to be canned, separate valves connected to said receptacles, a lever connecting said

valves, a pump connected to the aforesaid pipe, a lever actuated by the plunger of the filler, the pump-plunger connected to the latter lever, and a rod connecting said lever with the valve-lever and movable longitudinally on the former and provided with stops above and below the same and regulating the valves, substantially as described and shown.

In testimony whereof we have hereunto signed our names this 1st day of June, 1892.

JOHN R. ROWLAND. [L. S.]
JOHN F. HELM. [L. S.]

Witnesses:
MARK W. DEWEY,
E. LAASS.