(No Model.) 4 Sheets—Sheet 1.

W. B. PAGE.

CAN FILLING MACHINE.

No. 549,251. Patented Nov. 5, 1895.

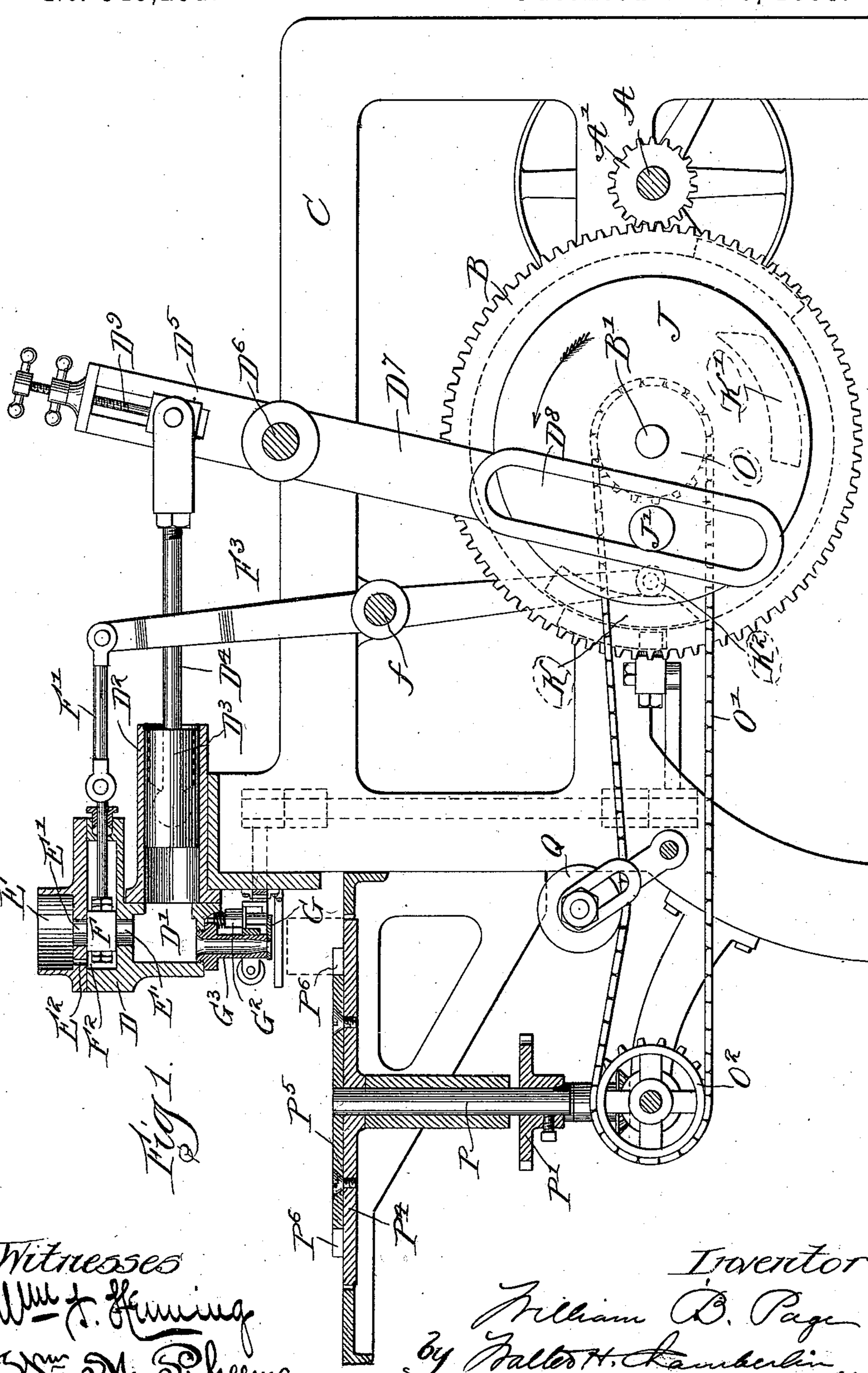

Fig. 1.

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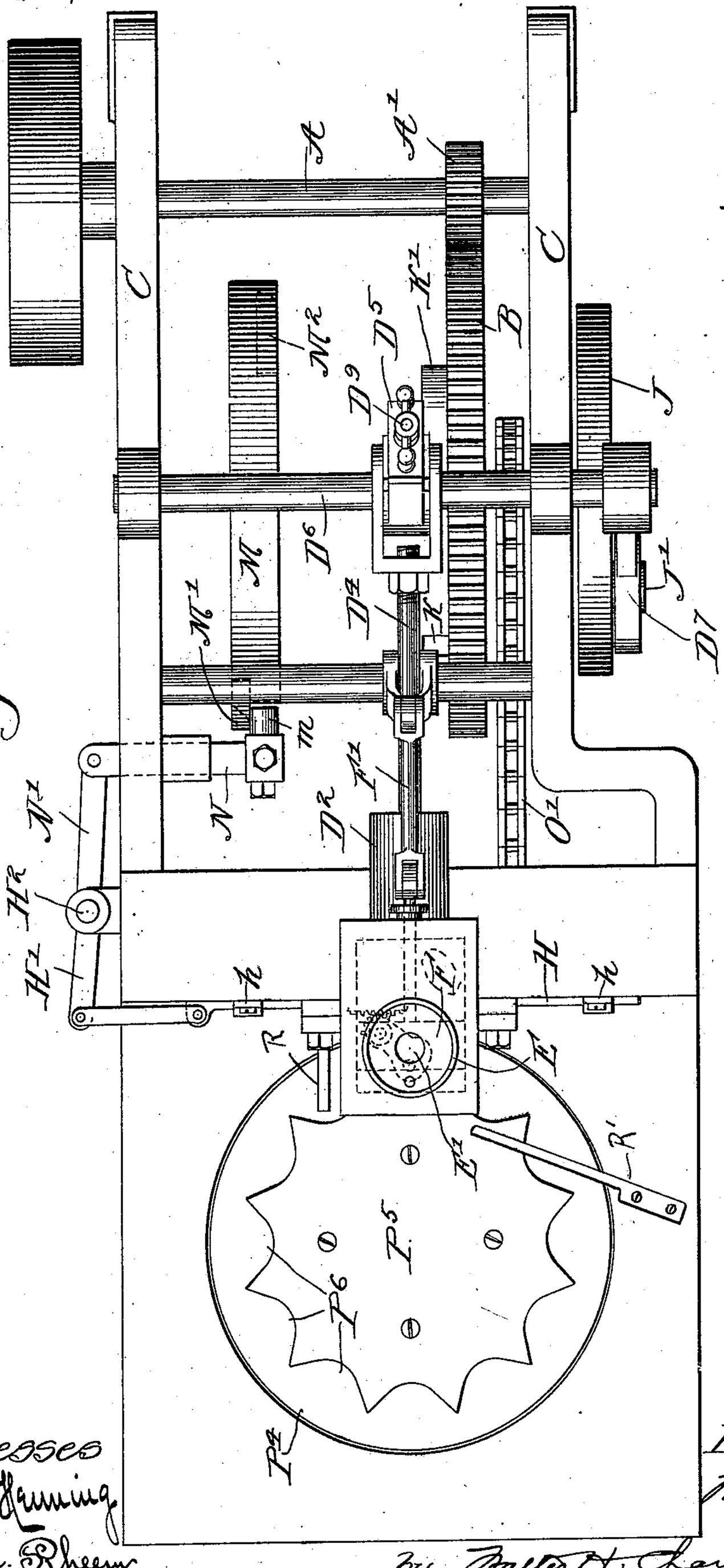

Fig. 2

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CAN FILLING MACHINE.

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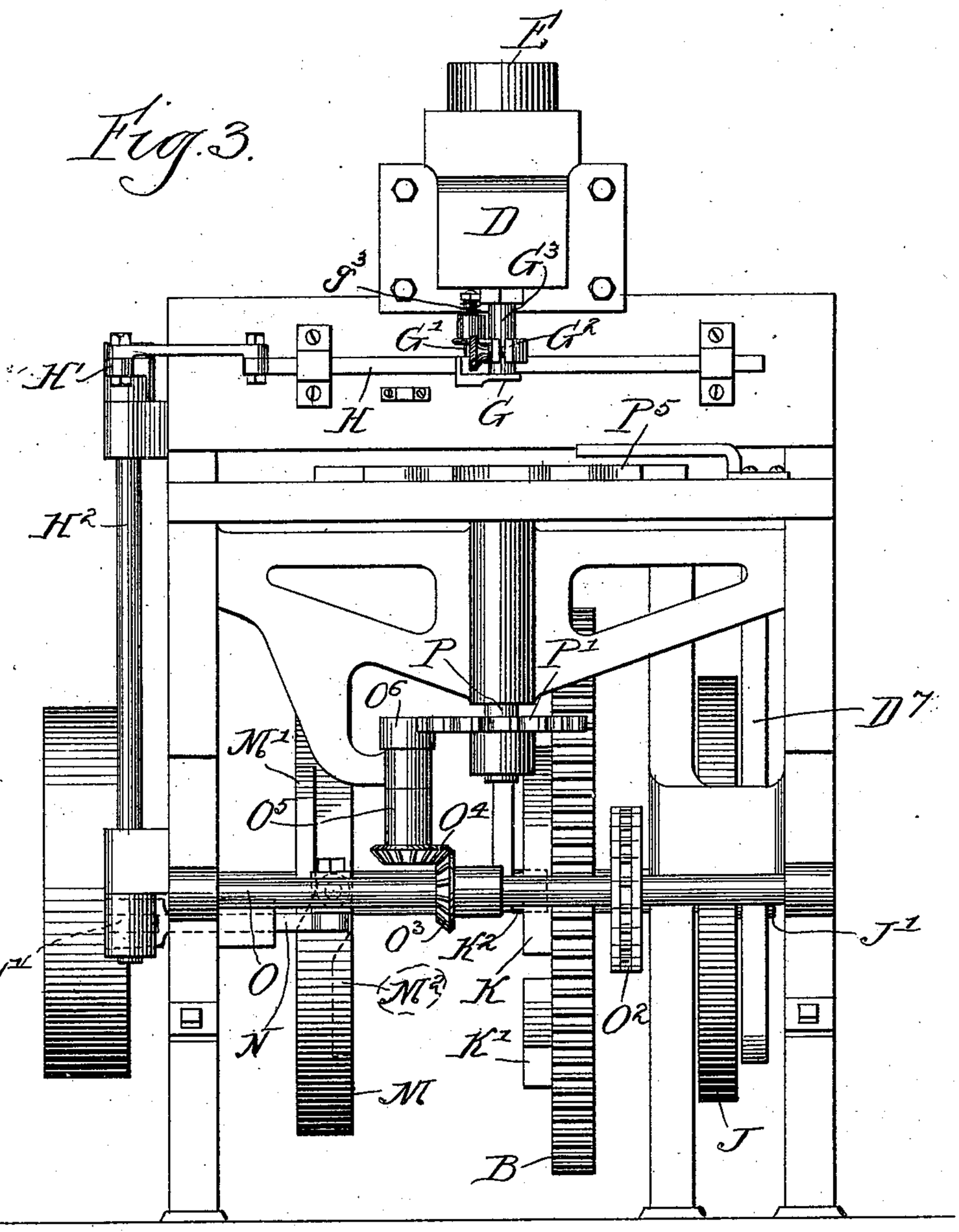
Fig. 3.



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CAN FILLING MACHINE.

No. 549,251. Patented Nov. 5, 1895.

Fig. 4.

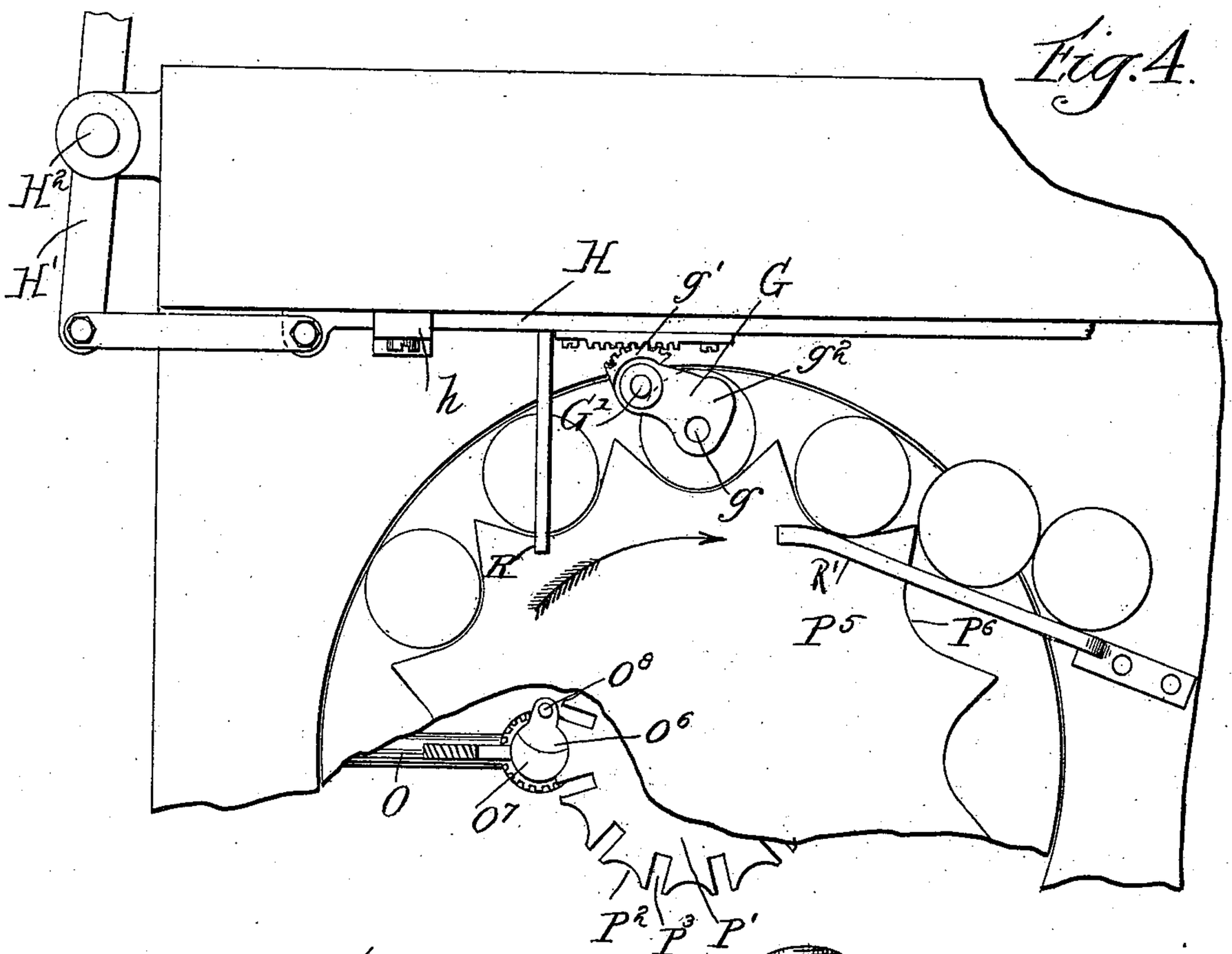


Fig. 5.

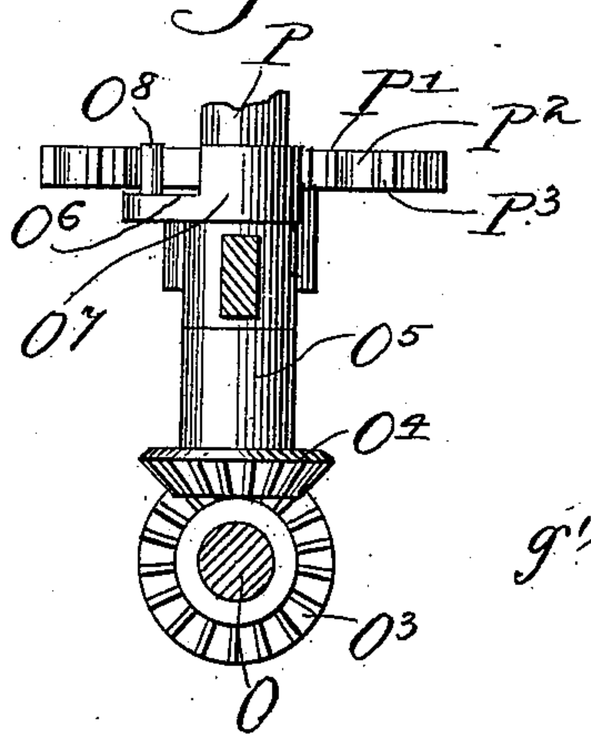
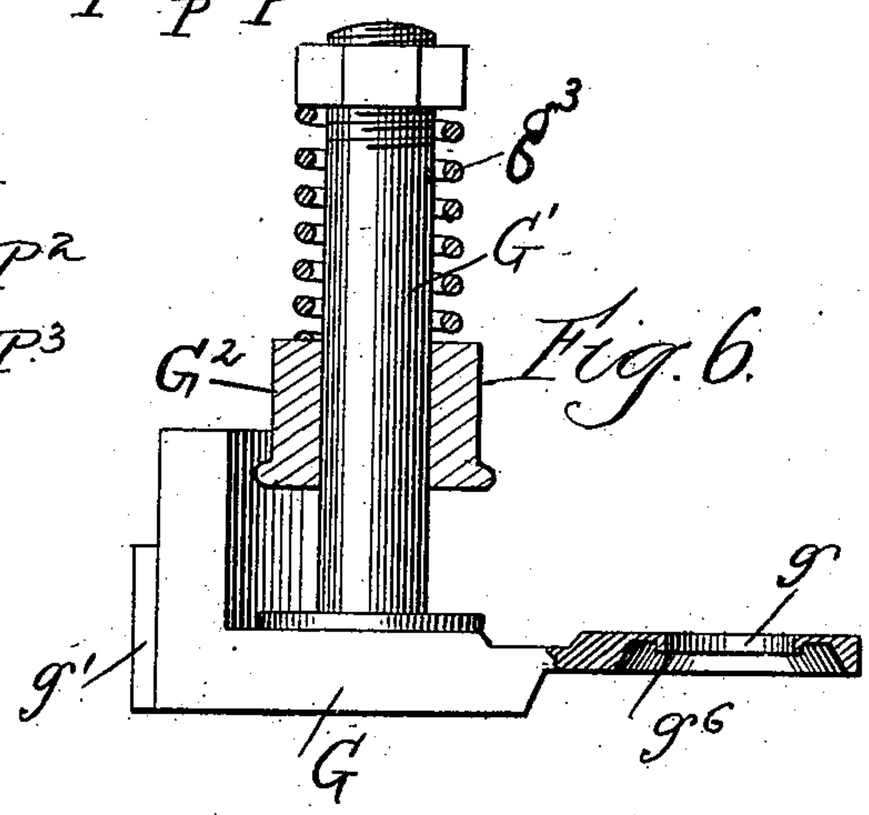


Fig. 6.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM B. PAGE, OF DIXON, ILLINOIS.

CAN-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 549,251, dated November 5, 1895.

Application filed July 1, 1895. Serial No. 554,517. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. PAGE, a citizen of the United States, residing at Dixon, county of Lee, State of Illinois, have invented a certain new and useful Improvement in Can-Filling Machines; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

Heretofore in the use of can-filling machinery some of the difficulties encountered have been as follows: The lower cut-off would not effectually prevent drops from falling on the sides of the can, particularly where a thick substance, such as condensed milk, was being operated upon. Again, difficulty has been experienced to so construct the measuring-receptacle that it would not leak. By a combination of devices and appliances my present invention overcomes these various difficulties and many others and produces a machine which is smooth, simple, and effective in its operation.

In the drawings, Figure 1 is a side elevation, with parts in section, of my machine. Fig. 2 is a plan view of the same. Fig. 3 is a front elevation; Fig. 4, a plan view of a portion, showing the table on which the cans are placed. Fig. 5 is a detail showing in elevation the table-revolving mechanism. Fig. 6 is a detail in elevation of the lower cut-off.

In carrying out the invention, A represents the drive-shaft of the machine, which may be driven from any suitable source of power. Located thereon is a pinion A′, which meshes with the gear B on the parallel counter-shaft B′.

C is the main frame of the machine.

D is a head supported by the machine-frame, having a hollow chamber D′, forming the measuring-receptacle.

D^2 is a cylinder, one end communicating with said receptacle D′, and D^3 is a piston-head working in said cylinder, a pitman D^4 being engaged to said piston-head D^3 and the pitman pivoted to the upper end of the lever D^5, the latter being operated as hereinafter described.

E represents the tube or pipe communicating with the supply of material upon which the machine is operating.

The first application of my present machine was for the purpose of filling cans with condensed milk, and I will therefore, for the sake of illustration, speak of milk as the substance placed in the cans by the machine.

Communicating from the pipe E to the receptacle or chamber D′ is a passage E′, and F is what may be termed the "cut-off valve" for opening and closing said passage E′.

F′ is the pitman for said valve, the said pitman being pivoted to the lever F^3, which is tilted or operated as hereinafter described.

G is what I may term the "lower cut-off." It is a small arm or lever (see Fig. 6) provided with an orifice *g* and provided with the pin G′, the latter being supported by the socket or clamp G^2, said clamp G^2 being engaged to the nozzle G^3, and said nozzle G^3 engaged by screw-threads or otherwise with the main head D. In order that the portion G^2 may have a proper bearing against the nozzle, I provide on the upper end of the pin G′ the lock or bearing nut and an intermediate spring g^3, which bears against the supporting-clamp G^2, and thus keeps the cut-off against the end of the nozzle by a constant spring-pressure.

The cut-off G is provided with a segment *g′*, which meshes with the rack-bar H, the latter sliding in the bearings *h* and connected with the arm H′ on the vertical shaft H^2, said shaft H^2 being operated, as will be hereinafter described, so that a partial revolution of the shaft H^2 operates through the bar H and segment *g′* to tilt the cut-off G and throw the orifice *g* under or away from the nozzle, as will be hereinafter more fully described.

On the counter-shaft B′ is a disk J, having on its face a pin or roller J′. The lever D^5 is fixed to another counter-shaft D^6, and extending from this counter-shaft is the fixed lever D^7, which has on its lower end the slotted bearing D^8, which embraces the pin J′. It will be observed that the slot D^8 in the arm or lever is somewhat larger than the diameter of the pin, for a purpose to be hereinafter more fully described. On the face of the gear B are two cams K K′. The lever F^3 (pivoted at *f* to the main frame) has its lower end adjacent to the path of said cams K K′. A roller K^2 on said lower end of the arm F^2, directly

in the path of said cams, is struck by them, and this tilts the arm. The roller is thrown in one direction by the cam K and then back again by the cam K′. On the counter-shaft B′ is another disk M, on the periphery of which are two cams M′ M². A bar N, sliding horizontally in suitable bearings on the frame, has a roller *m*, which terminates in the path of and is struck by the cams M′ M², the cam M′ causing the roller to move the bar horizontally in one direction and the cam M² to return it. This bar N is pivoted to an arm N′ on the lower end of the vertical shaft H², so that a horizontal movement of the bar N partially revolves the shaft H², and, as above described, this operates the lower cut-off. We thus see that when the main shaft is revolved the counter-shaft B′ will through the gear B also be revolved. A revolution of this counter-shaft revolves the disk J, which in turn tilts the lever D⁵, and the main piston D³ is thus operated. The revolution of the gear B causes its cams K K′ to tilt the arm F², and this operates, as above described, to move the upper cut-off piston F back and forth to open and cut off the supply of milk to the receptacle D′. The revolution of the disk M acts through the cams M′ M² to move the sliding bar N, and the movement of the latter operates the lower cut-off G. On the shaft B′ is also a sprocket-wheel O, provided with a sprocket-chain O′, which runs to the forward part of the machine, where there is another counter-shaft with a sprocket-wheel O². On this shaft is a beveled gear O³, which meshes with the beveled gear O⁴ on the vertical shaft O⁵. On the upper end of this shaft O⁵ is a plate O⁶, of peculiar shape, a portion, as shown in Fig. 4, being crescent or moon shaped, as at O⁷, with a pin O⁸ in the concave side. Adjacent to the shaft O⁵ is another vertical shaft P, on the upper end of which is a table that carries the cans to be filled.

On the lower end of the shaft P is a plate P′, having on its periphery a series of rounded indentations P² and a series of deeper indentations P³, the shallow and deep indentations alternating with each other, as shown in Fig. 4. The plate P′ and the plate O⁶ are placed in such relation with each other that a revolution of the shaft O⁵ and plate O⁶ will cause the pin O⁸ to engage in the deep indentations P³ and revolve the plate P′ and as soon as the plate P′ has been moved the proper distance the rounded or crescent portion O⁷ will engage in the shallow indentation P² and prevent a further movement of the plate P′ until the pin has made another revolution and engaged in the next deep indentation. It will thus be seen that the table P⁴ on the upper end of the shaft P is always moved just sufficiently to carry the next can under the nozzle, and it is then held against further motion by the portion O⁷ riding in the shallow indentation P² until the filling apparatus has completed its work.

The general operation of the machine is as follows: A quantity of milk is placed in a suitable receptacle above the machine, the pipe E leading therefrom down to the hollow head or measuring-receptacle D′. The machine is shown with the upper cut-off cutting off the supply, the filling or main piston about to move forward, and the lower cut-off with the orifice *g* under the nozzle. It will be observed, as mentioned above, that the bearing-slot D⁸ on the lower end of the arm D⁵ is larger than the pin J′, which it engages, so that, while the disk J revolves continuously, there is a lost motion for the pin J′ at each half-revolution of the disk—that is, the arm D⁵ remains stationary while the pin is traveling across the slot D⁸. During this pause in the motion of the main piston D³ the cut-offs operate. The cams are so arranged that as the piston D³ moves backward and reaches the backward end of its stroke the cam K moves the piston F forward and cuts off the supply from the pipe E. The instant the upper piston has cut off the supply above, the cam M′ moves the lower cut-off so that the hole *g* is underneath the nozzle. This action of the two cut-offs, one cutting off above and the other opening up below, takes places while the main piston D³ is stationary because of the lost motion above mentioned. The piston is now moved forward by the pin J′ and forces the milk in the receptacle D′ down into the can below. As the piston reaches the forward end of its stroke there is again a cessation of its movement for an instant, and during that time the cam M² operates the lower cut-off to move the portion *g*² under the nozzle, and thus cut off the supply, and immediately this is completed the cam K′ operates to open the upper cut-off, so that the backward movement or retraction of the piston D³ draws down a supply of milk from the pipe E. The parts are so timed that as soon as the lower cut-off has shut off the supply of milk to the can the pin O⁸ engages in the slot P³ and revolves the table sufficiently to bring the next succeeding can under the nozzle and the operation is completed. In practice it has been found that frequently a small amount of milk will accumulate on the lower cut-off, and at each succeeding cut off of the supply a little more would be added, until a drop was formed sufficient to drop down very often as the can was leaving its position under the nozzle, and the drop would strike the side or top of the can outside the opening. This entails more or less labor in cleaning the cans and is to be avoided. To accomplish this, I provide the lower face of the cut-off adjacent to the opening with a projection *g*⁶. (See Fig. 6.) This projection may be either simply a pin or it may be an annular ridge or an elongated ridge. Its office is to engage and hold adjacent to the opening any milk that may leave the main stream, so that when the cut-off is again thrown the stream of milk will pick up the drop that was left behind by the previous

operation and carry it into the can; or, in other words, this projection, being adjacent to the opening, stops any milk from leaving the stream and getting away from the opening so that it cannot be picked up by the next stream.

E^2 is a hole leading from the way or cylinder F^2, in which the piston F works, up to the pipe E. Its office is as follows: When the piston comes forward and passes the opening or passage E′, the space in advance of the piston will be filled with milk, and there being no outlet for this milk and the pressure on it being enormous it would be either forced out through the seams between the plates of the head or else the piston would be stopped in its movement. To obviate this, the hole E^2 is provided, so that as the piston comes forward it will simply press the milk in advance of it back up into the receptacle E. It is of course obvious that the various parts could be made adjustable. For instance, the point of engagement between the pitman D^4 and the upper end of the arm or lever D^5 could be made adjustable—as, for instance, by the screw D^9—for the purpose of adjusting the length of the stroke of the piston D^3, and thus graduating the amount of milk that could enter the receptacle D′. So, also, the cams for operating the cut-offs could be engaged to their respective disks by slotted engagement, so that they might be adjusted to regulate the times of operations of the cut-offs. So, also, by making the plate or table P^4 with a removable upper table P^5, having rounded recesses P^6 on the periphery, the machine could be altered to fit various-sized cans by simply removing this top plate and substituting another with smaller or larger recesses, as the case may be.

Q is a tightening-pulley for insuring the steady motion of the sprocket-chain, and thus regulating the motion of the table.

R is a guard located immediately above the tops of the cans on the table and is to prevent a can that has not been placed squarely on the table and is tilted up, so that its edge is higher than should be, from striking against and breaking the nozzle G^3.

R′ is a guard-arm attached to the stationary portion of the table and projecting from the revolving table at such a height as to engage the filled cans as the table revolves and switch them off from the revolving table onto the stationary table, where they may be removed by the operator.

It is obvious that while in the above-described machine I have shown only sufficient apparatus to fill but a single can at a time, yet I might employ a number of tables and measuring-receptacles D′, and, in fact, multiply all of the mechanisms indefinitely. So, also, there might be two or three measuring-receptacles formed in the same head, the cut-offs and pistons whereof might be operated by a single set of driving mechanism, and instead of removing the revolving table the space of one can at each operation it might be made to move to bring two cans simultaneously under two sets of nozzles. In other words, the parts might be easily duplicated and the capacity of the machine thus multiplied indefinitely without departing from the spirit of my invention.

What I claim is—

1. In a can filling machine the combination with a stationary receptacle having a passage leading from a source of supply and a discharge nozzle of a piston for drawing the substance operated upon into the receptacle and forcing it out thereof, cut offs and means for operating the same located on each side of the receptacle to govern the admission to and the exit from the receptacle and a can carrier for carrying the cans successively beneath the discharge from the receptacle, substantially as described.

2. In a can filling machine the combination of a stationary measuring receptacle, cut offs and means for operating the same for regulating the admission to and exit from said receptacle and a piston for drawing the substance into and forcing it out of the receptacle, said piston engaged with the power mechanism by intermittently operating mechanism, substantially as described.

3. In a can filling machine the combination with a stationary measuring receptacle and cut offs and means for operating the same for regulating the admission to and exit from said receptacle of the piston for drawing the substance into and forcing it out from the receptacle, said piston engaged with the power mechanism by an enlarged or slotted engagement whereby at regular intervals the piston is stationary while the power mechanism is continuous in its motion, substantially as described.

4. In a can filling machine the combination with the measuring receptacle and cut offs of the piston for drawing the substance into and forcing it out from the receptacle, said piston engaged to a lever having a slotted end and a revolving disk driven by the power mechanism having a pin working in said slotted end, the slot in the lever being larger than the diameter of the pin, substantially as described.

5. The combination of the power mechanism, a measuring receptacle, a piston for drawing the substance into and forcing it out from the receptacle, intermittent connecting mechanism between the piston and the power mechanism and cut offs for regulating the admission to and discharge from the measuring receptacle, said cut offs connected with the power mechanism by intermittently operating mechanism substantially as described.

6. The combination of a measuring receptacle, cut offs on each side of the said receptacle, a piston for filling and emptying said receptacle, a tilting arm or lever to the upper end of which the filling piston is connected, a tilting arm or lever to which the upper cut off is connected and a sliding arm or lever to

which the lower cut off is connected, a disk on a driving shaft having a pin which engages an enlarged slot in the piston lever and thereby intermittently tilts the same, and cams on disks on said shaft to intermittently shift the upper cut off lever and the lower cut off arm or lever, substantially as described.

7. In a can filling machine the combination with a shaft as at B′ of a revolving table, intermittently operating mechanism between said table and shaft, a measuring receptacle, having a discharge nozzle above the table, a cut off above said receptacle, intermittently operating mechanism between said cut off and the driving shaft B′ a lower cut off, connected by intermittently operating mechanism with the drive shaft, and a filling and discharge piston connected by intermittently operating mechanism with the drive shaft, substantially as described.

8. In a can filling machine the combination with the shaft as at B′ of the revolving table, intermittently operating mechanism between said table and shaft, a measuring receptacle having a discharge nozzle above the table, a cut off above said receptacle, intermittently operating mechanism between said cut off and the driving shaft B′ and lower cut off connected by intermittently operating mechanism with the drive shaft, and a filling and discharge piston connected by intermittently operating mechanism with the drive shaft, said mechanism so timed that as the filling and discharge piston reaches its backward movement the upper cut off will close the inlet within the lower cut off, open the outlet and then the piston move forward to discharge, substantially as described.

9. The combination with the discharge nozzle of a cut off lever pivoted adjacent to the discharge nozzle on a vertical pivot, said lever operated by a rack bar and segment, substantially as described.

10. In a can filling machine the combination with the discharge nozzle and a lever having on one end a segment meshing with a reciprocating rack bar and having on the other end an imperforate portion and an orifice, and a projection on the under side of said cut off adjacent to the orifice, substantially as described.

11. In a can filling machine the combination with the discharge nozzle and a lever having on one end a segment meshing with a reciprocating rack bar and having on the other end an imperforate portion and an orifice and an elongated projection on the under side of said cut off adjacent to the orifice, substantially as described.

12. In a can filling machine the combination with the measuring receptacle, the supply pipe leading in the said measuring receptacle, and the cut off for cutting off admission to the receptacle of a passage leading from a point in advance of the cut off back to the supply pipe, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

WILLIAM B. PAGE.

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