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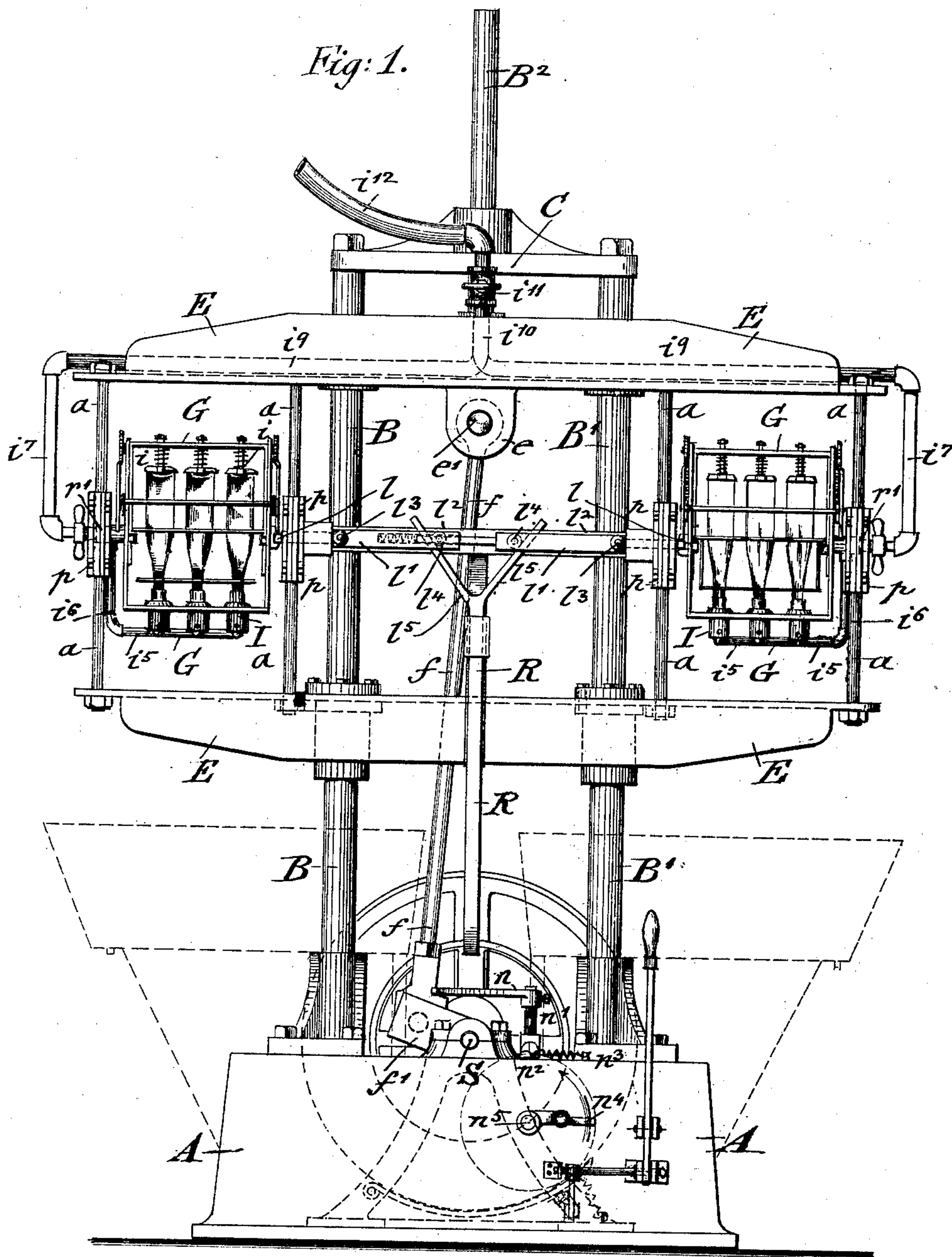
Patented Dec. 23, 1902.

A. PERTHOLD.
BOTTLE WASHING MACHINE.

(Application filed May 5, 1902.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES:

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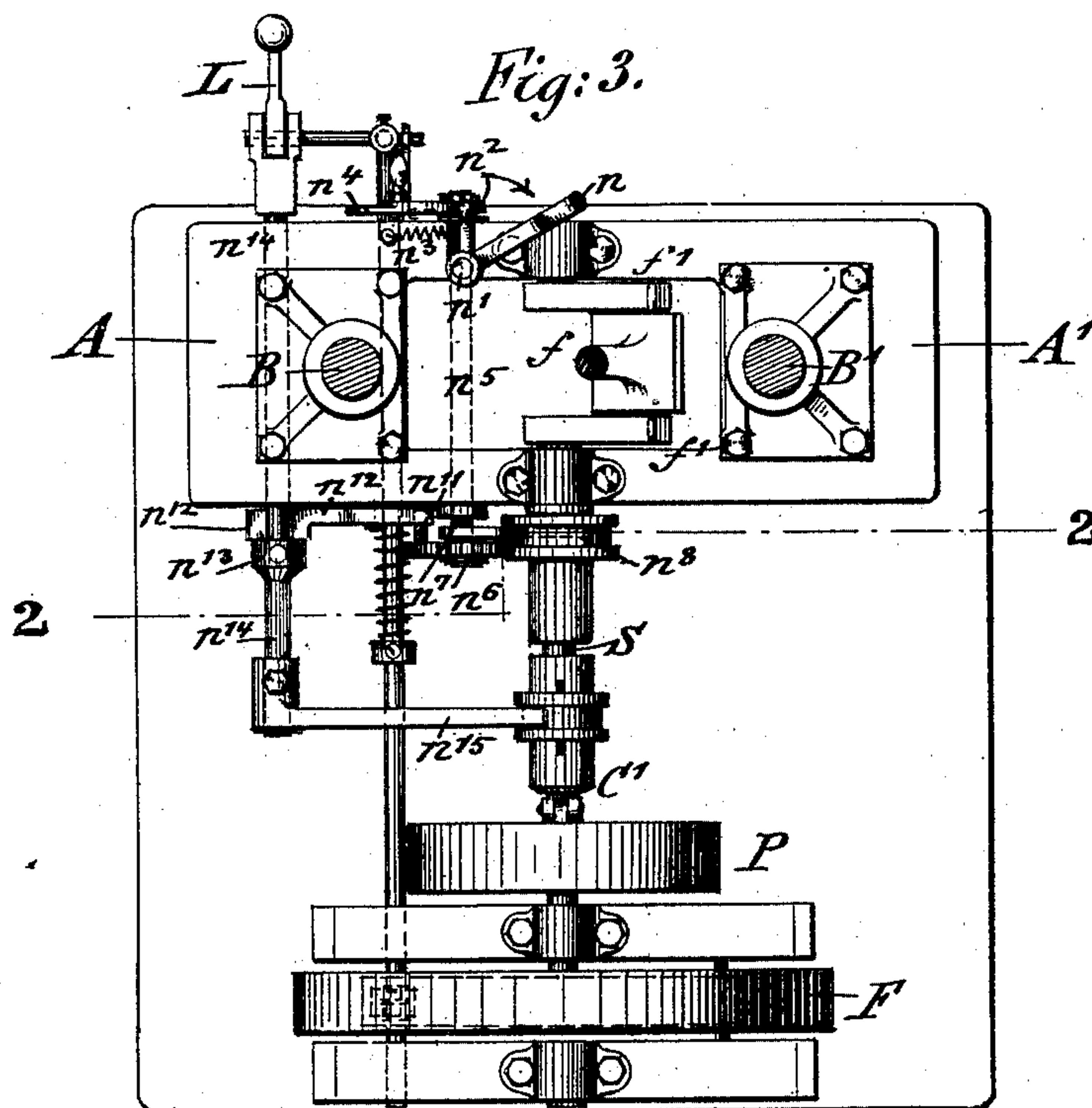
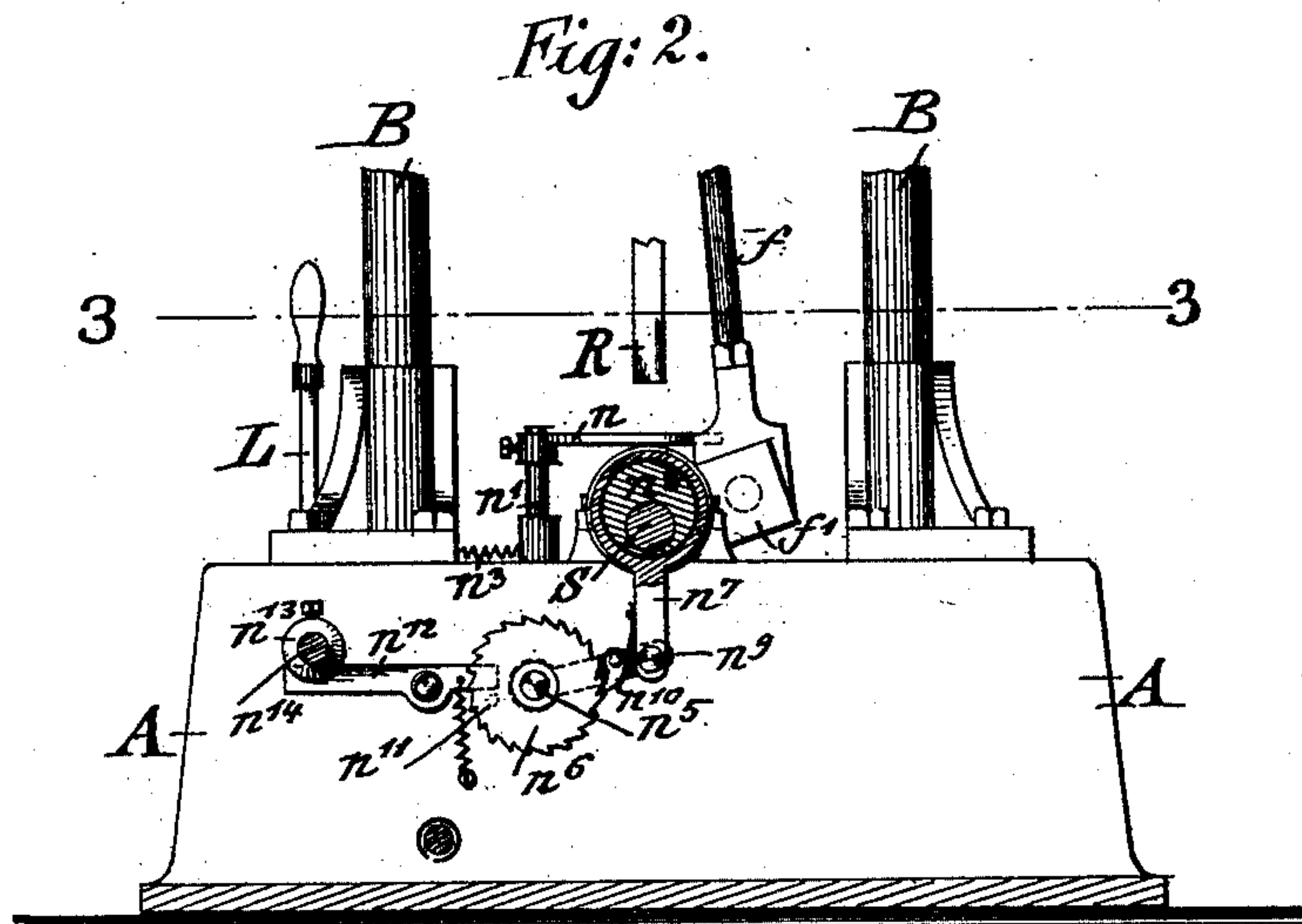
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(No Model.)

4 Sheets—Sheet 2.



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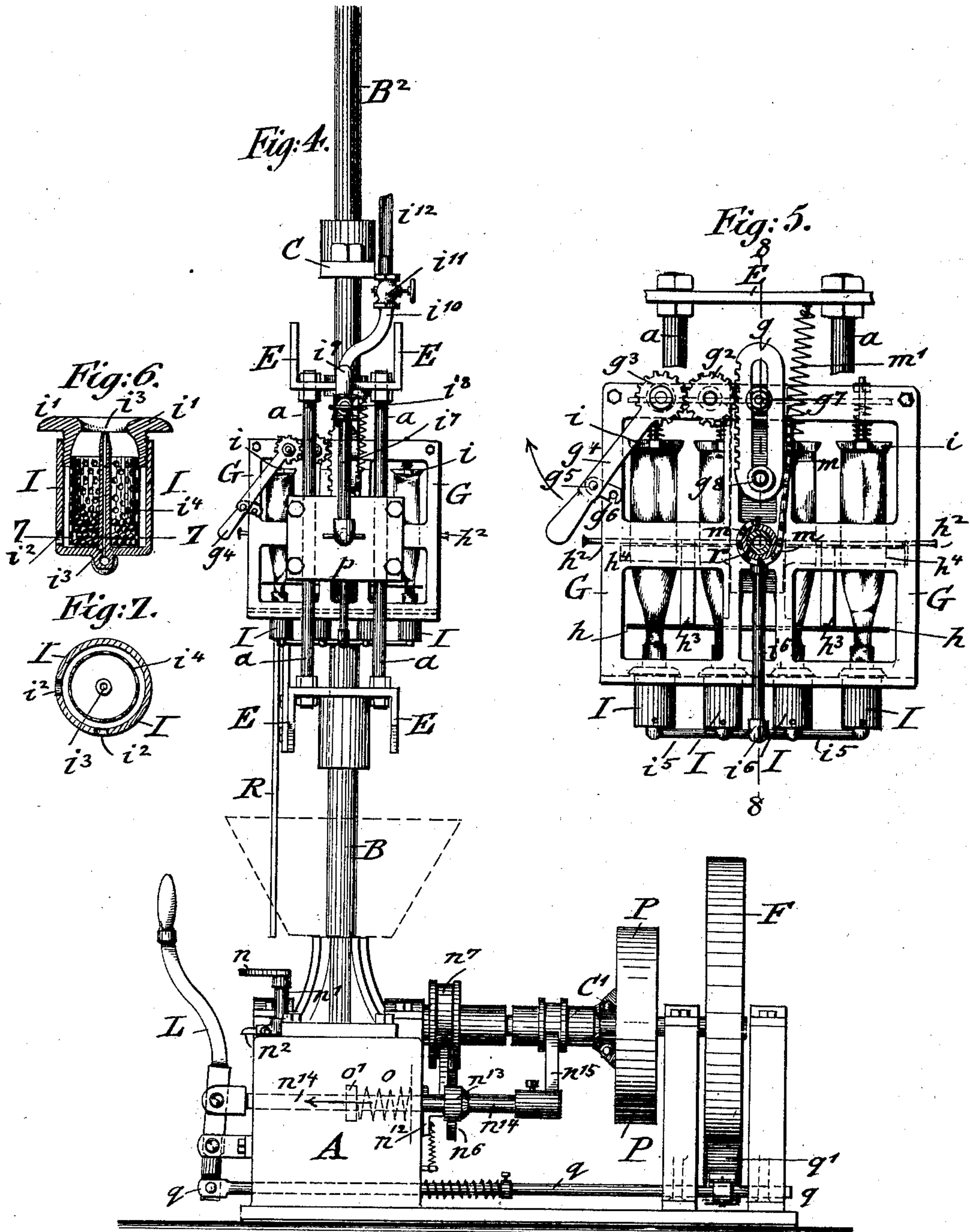
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4 Sheets—Sheet 3.



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4 Sheets—Sheet 4.

Fig: 8.

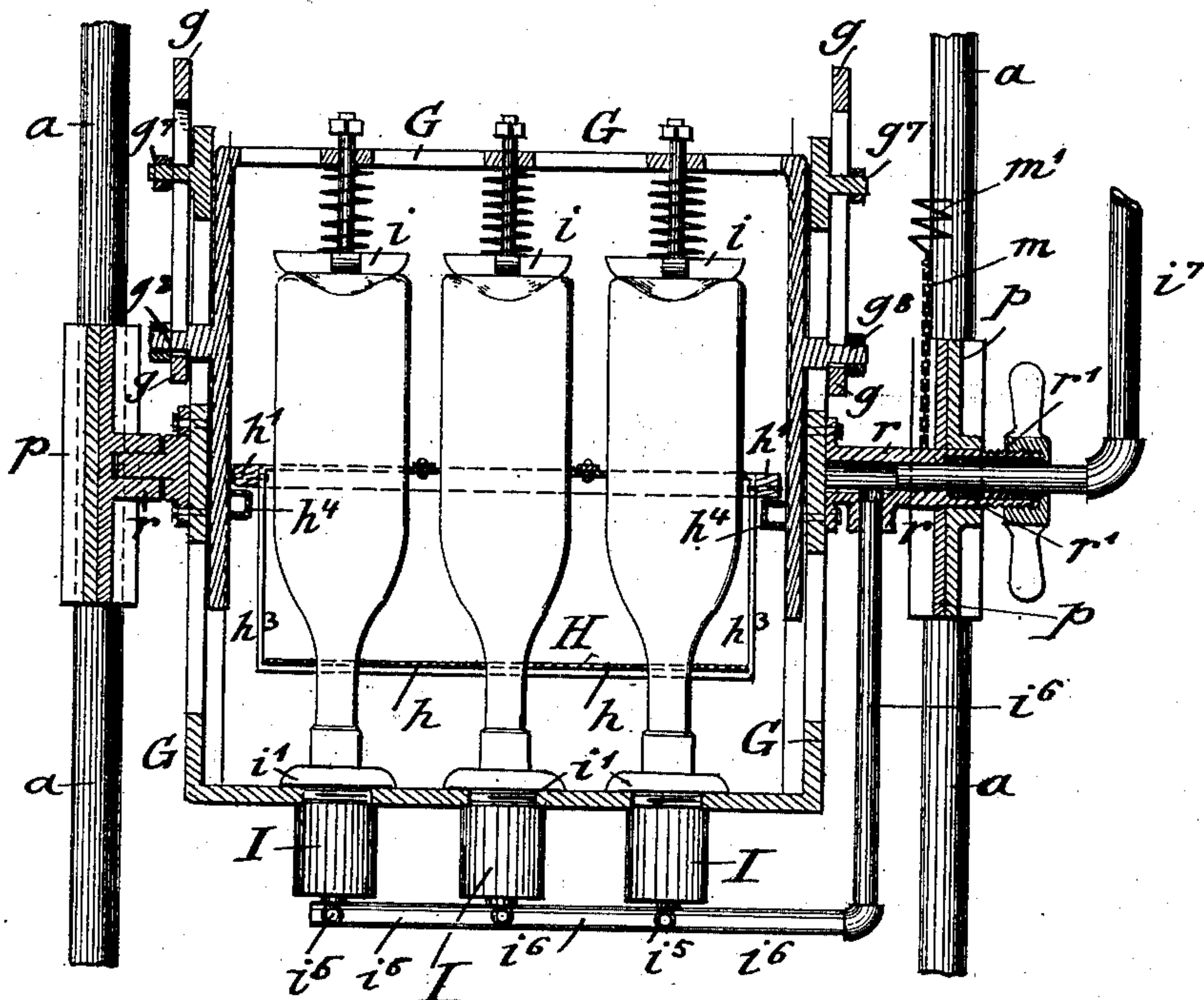
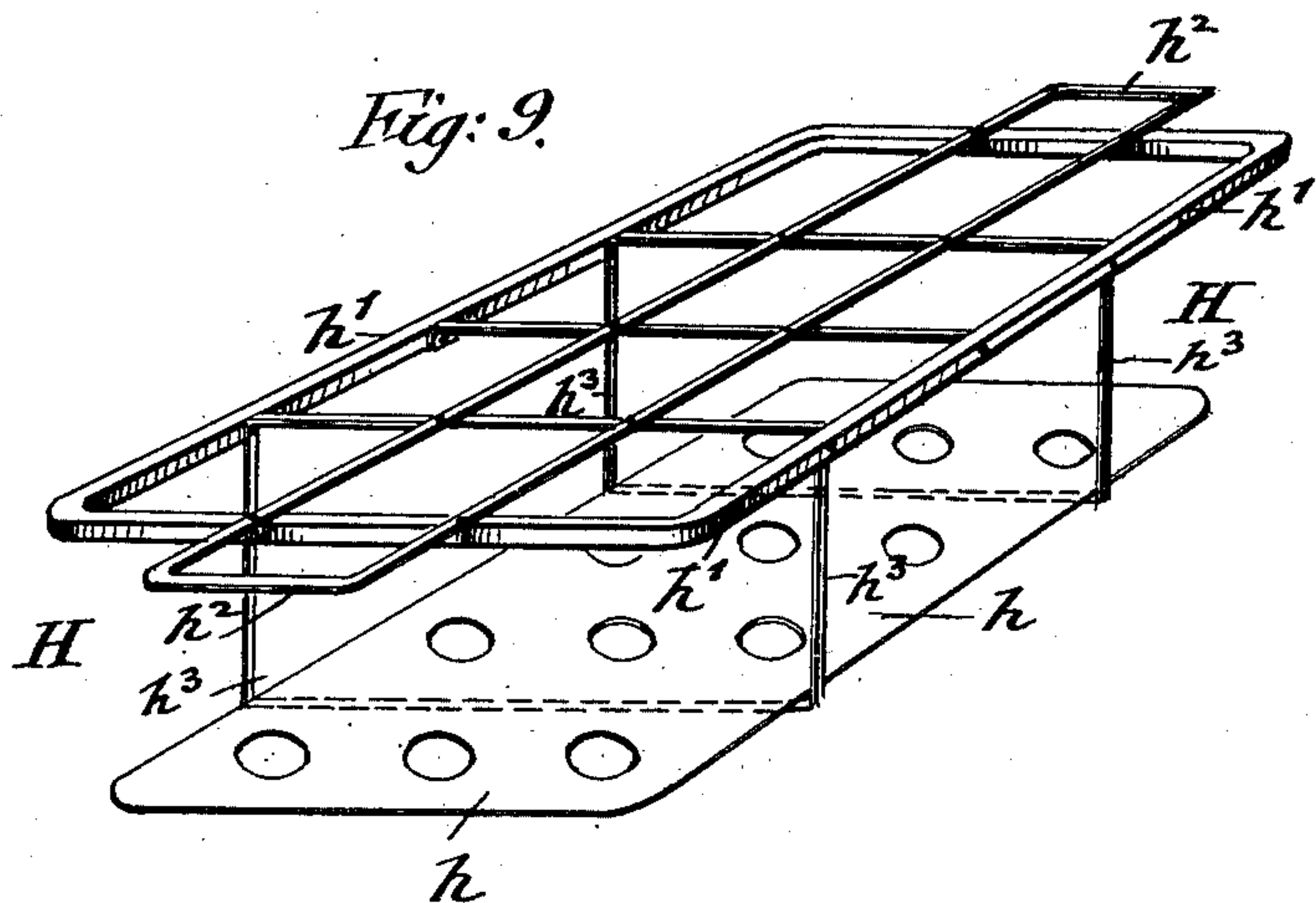


Fig: 9.



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UNITED STATES PATENT OFFICE.

ANDREW PERTHOLD, OF NEW YORK, N. Y.

BOTTLE-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 716,644, dated December 23, 1902.

Application filed May 5, 1902. Serial No. 106,081. (No model.)

To all whom it may concern:

Be it known that I, ANDREW PERTHOLD, a citizen of the United States, residing in New York, borough of Manhattan, and State of New York, have invented certain new and useful Improvements in Bottle-Washing Machines, of which the following is a specification.

This invention relates to bottle-washing machines of that class in which a vertically-reciprocating frame carrying bottle-holding frames provided with means for holding the bottles, shot-supplying cylinders, and nozzles for supplying water is reciprocated so as to produce the cleaning of the interior of the bottles by the action of the shot in connection with the water supplied to the interior of the bottles; and the invention relates more specifically to certain improvements in the Letters Patent for bottle-washing machines which were heretofore granted to me under date of April 24, 1900, No. 648,217, said improvements being designed with the view of producing the automatic reversal of the bottle-holding frames after a predetermined number of reciprocations had been imparted to the same, so as to reverse the position of the bottles, after which they are again reciprocated for a predetermined number of times, when the machine is finally stopped; and for this purpose the invention consists of a bottle-washing machine which comprises bottle-holding frames that are reciprocated with the main frame of the machine for a certain number of times, automatically-operated mechanism by which the bottle-holding frames are reversed, so as to place the bottles in inverted position for subjecting them to an additional number of reciprocations, and mechanism for automatically interrupting and arresting the reciprocating motion of the main frame and bottle-holding frames when the washing of the bottles is completed.

The invention consists, further, of certain details in the construction of the mechanism for locking the bottles, with their crates, to the bottle-holding frames, in the mechanism for unshipping said bottle-holding frames at the proper time, so as to permit the automatic reversing of the same, and, lastly, in certain additional details of construction, which will

be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 is a front elevation of my improved bottle-washing machine. Fig. 2 is a rear elevation of the lower part of the same, partly in section, on line 2 2, Fig. 3. Fig. 3 is a plan view of Fig. 2, partly in horizontal section on line 3 3, Fig. 2. Fig. 4 is a side elevation of my improved bottle-washing machine. Fig. 5 is a side elevation of one of the bottle-holding frames, drawn on a larger scale, showing the mechanism for locking the crate and the reversing mechanism of the frames, the latter being partly in section. Figs. 6 and 7 are respectively a detail vertical transverse section and a horizontal section on line 7 7, Fig. 6, of the shot-cylinders, shown as detached from the machine. Fig. 8 is a vertical section on line 8 8, Fig. 5; and Fig. 9 is a perspective view of one of the bottle-crates.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the base of the bottle-washing machine. The base A is provided with upright columns B B', which are connected at their upper ends by a transverse yoke-piece C, that is firmly attached by fastening-screws to the upper ends of the columns B B'. On the columns B B' is guided a transverse main frame, which consists of two horizontal double-webbed beams E E, of U-shaped cross-section, that are connected by upright brace-rods *a*. The lower beam is provided with longer sleeves for sliding on the upright columns B B', while the upper beam is provided with shorter sleeves for the same purpose. The upper beam E carries at its center portion a shorter column B², which extends upwardly through a sleeve at the center of the yoke-piece C, so that the main frame E E is guided on the upright columns B B' and by the column B² in the yoke-piece C. By the arrangement described a vertically-sliding motion can be imparted to the main frame E E on the columns B B' and the yoke-piece C. The upper beam E is provided at its under side with center lugs *e*, which are parallel with each other and which serve to receive the wrist-pin *e'* of a connecting-rod *f*, that is driven by a double

crank f' on the driving-shaft S. The driving-shaft S turns in suitable bearings on the base A and receives rotary motion by a belt-and-pulley transmission from an overhead power-shaft, so as to impart reciprocating motion to the main frame E E, a properly-counter-balanced fly-wheel F on the driving-shaft serving to steady the reciprocating motion of the main frame E E.

10 To the center portions of the upright brace-rods a are bolted bracket-plates p , which are provided with gudgeons r , on which two bottle-holding frames G are pivotally mounted, one at each end of the main frame E E, as shown in Fig. 1. Each bottle-holding frame G is formed of two U-shaped sections, of which the inner one is guided and capable of adjustment within the other by means of slotted slide-plates g , that are arranged on the side walls of the outer frame-section, said slotted slide-plates being toothed at one of their sides, so as to mesh with intermediate pinions g^2 , which again mesh with pinions g^3 on the ends of lever g^4 , that are connected by pivoted and recessed latches g^5 with fixed pins g^6 when the inner or clamping frame-section is applied to the bottles, as shown in Fig. 5. The slotted slide-plates g are guided on headed bolts g^7 on the side walls of the outer frame-section and connected by headed bolts g^8 with the inner or clamping frame-section, so that when the levers g^4 are turned in the direction of the arrow, Fig. 5, the slotted slide-plates at both sides of the outer frame-section are raised, and thereby the inner or clamping frame-section lifted in the outer frame-section; but when the levers g^4 are turned in downward direction the slide-plates g are moved in downward direction, together with the inner frame-section, the latter following the motion of the slide-plates by gravity.

The bottles are placed in suitable crates H, which are formed of a lower perforated plate h , of sheet metal of suitable strength, an upper frame h' of cross-straps, having handles h^2 at the ends, and upright straps h^3 , as shown in Fig. 9. The bottles to be washed are inserted in inverted position, with mouths downward, into the crates, and then lifted, with the crates, into the bottle-holding frames, so as to rest by the reinforced sides of the upper frames h' on sides rails h^4 at the interior of the inner or clamping frame-section, so as to be clamped into position by the outer and inner sections of the bottle-holding frames. For this purpose the bottom of the outer frame-section is provided with stationary shot-cylinders I, the construction of which is clearly shown in Figs. 6 and 7, as many shot-cylinders being arranged in the outer frame-section as there are bottles supported in the crate, so that the mouth of every bottle is supported in the mouth of a shot-cylinder. The inner or clamping frame-section is provided with a corresponding number of spring-actuated bottle-clamping fingers i , which press on the bottoms of the bottles, so as to hold them

firmly in position in the crates and bottle-holding frames. Each shot-cylinder I is provided with a seat i' , which is screwed into the mouth of the shot-cylinder, the latter being provided with apertures i^2 near its bottom, through which the water can escape into suitable collecting-troughs, (shown in dotted lines in Figs. 1 and 4,) and at the interior with a central nozzle i^3 , that extends through the bottom of the shot-cylinders in upward direction into the bottle-seat, while a perforated sheet-metal cylinder i^4 is supported in the shot-cylinders, said cylinders serving for retaining the shot so as to prevent its escape through the side openings in the shot-cylinders during the shaking action to which they are subjected.

The shot-cylinders I are supported in openings in the bottoms of the outer sections of the bottle-holding frames and are securely held therein by tightly screwing the rimmed seats i' onto the upper ends of the shot-cylinders H, as shown in Fig. 8. The central supply-nozzles i^3 are connected at the bottoms of the shot-cylinders by branch pipes i^5 with a central supply-pipe i^6 , said supply-pipe extending in upward direction along the outside of the bottle-holding frame G to the low gudgeon r and through a stuffing-box r' to the outside of the plates p , as shown in Fig. 8. The pipe i^6 is then connected with a water-supply pipe i^7 , provided with a stop-cock i^8 , a pipe i^9 on the upper beam E, and a central upright pipe i^{10} , provided with a main stop-cock i^{11} , and a flexible hose i^{12} with a suitable source of water-supply under pressure, so that when the stop-cocks are opened a steady supply of water is conducted through the main and branch pipes to the nozzles of the shot-cylinders and ejected from the same under pressure into the interior of the bottles supported in the bottle-holding frames.

The joint action of the shot that is moved up and down in the bottles by the reciprocation of the bottle-holding frames, together with the action of the water, produces the cleansing of the bottles in a quick and effective manner after the same have been subjected to the reciprocating action of the main frame for a certain length of time.

The bottle-holding frames are prevented from turning on their gudgeons r by means of locking-latches l , which enter into recesses of the inner gudgeons r , as shown in Fig. 1. The latches l are guided by guide-pieces l' on transverse guides l^2 , that are supported on the inner plates p of the rods a . The guide-pieces l' are provided with handles l^3 for permitting the manual actuation of the latches in locking the bottle-holding frames to or unlocking them from the main frame E. The sliding guide-pieces l' are provided at their opposite ends with antifriction-rollers l^4 , which are engaged by the inclined arms l^5 of a vertically-guided unshipping-rod R, which is clearly shown in Figs. 1 and 4. This unshipping-rod serves, in connection with suit-

able mechanism arranged on the base A of the machine, for automatically reversing the position of the bottle-holding frames after the bottles have been subjected to a predetermined number of reciprocations. For accomplishing this without jar the gudgeons of each bottle-holding frame are connected by chains m and strong helical springs m' with the upper beam E, while the lower ends of the chains are passed around the hollow gudgeons and attached thereto, as shown in Fig. 5.

On the base A is arranged below the unshipping-rod R an arm n , which is applied to an upright shaft n' , that turns in suitable bearings of the base, said upright shaft being provided with a forwardly-extending toe n^2 , which is connected by a helical spring n^3 with the base, as shown in Figs. 1 and 3. The toe n^2 is engaged intermittently when a certain number of reciprocations have been imparted to the main frame E E by a rotary arm n^4 , that is keyed to a shaft n^5 . The shaft n^5 extends transversely through the base A and carries at its opposite end a ratchet-wheel n^6 , to which a step-by-step motion is transmitted by means of a lever-arm n^7 , strapped to an eccentric n^8 on the driving-shaft S, and an oscillating arm n^9 , which is pivoted to the shaft n^5 of the ratchet-wheel n^6 and provided with a pivoted and spring-actuated pawl n^{10} , which engages the teeth of the ratchet-wheel and moves the same for the distance of one tooth at each rotation of the driving-shaft S. A pin n^{11} on the ratchet-wheel n^6 serves to engage the shorter arm of a fulcrumed and spring-actuated lever n^{12} after a predetermined number of rotations of the shaft and reciprocations of the main frame have been made. The longer arm of the fulcrumed lever n^{12} releases a collar n^{13} on a spring-actuated slide-rod n^{14} , which is guided transversely in the base A and provided at one end with a forked arm n^{15} , that engages the clutch C' of the driving-pulley P and that is connected on the other end with a fulcrumed hand-lever L. The slide-rod n^{14} is shifted by the spring o in the direction of the arrow shown in Fig. 4, so as to unship the clutch C', the spring being interposed between the wall of the base and a collar o' on the slide-rod n^{14} , as shown in Fig. 4. The hand-lever L is connected below its fulcrum to a guided and spring-actuated rod q , which carries at its opposite end a brake-shoe q' below the fly-wheel F, so as to apply the shoe and produce the gradual stopping of the machine as soon as the clutch C' is unshipped from the driving-pulley P. The fulcrumed lever n^{12} is acted upon by a helical spring so as to be turned into normal position as soon as the slide-rod n^{14} is shifted by the lever L and the clutch C' applied to the driving-pulley P for starting the machine.

The teeth of the ratchet-wheel n^6 are so proportioned that after one-half rotation of the same the arm n^4 on the opposite end of

its shaft engages the toe n^2 and moves the horizontal arm n into the path of the unshipping-rod R, so as to produce thereby the upward shifting of the unshipping-rod R and the withdrawal of the latches l from the gudgeons of the bottle-holding frames G, so that the spring-actuated chains of the same swing the frames through an angle of one hundred and eighty degrees, and thereby reverse the bottles, so that the shot-cylinders and nozzles are placed in a directly-opposite position to their former position. The bottle-holding frames are then relocked by the latches l and again subjected to reciprocating motion until the second half of the ratchet-wheel is turned, after which the pin n^{11} on the same actuates the fulcrumed lever n^{12} , unships the clutch from the driving-pulley, and applies simultaneously the brake to the fly-wheel, so that the motion of the machine is interrupted and the same quickly brought to rest by the automatic brake device.

My improved bottle-washing machine is operated as follows: The bottles to be cleansed are placed head downward into the crates and two crates at a time inserted into the machine, one into each bottle-holding frame. Before the crates are inserted the inner or clamping frame-section is raised by the lever-operated slide-plates, so as to permit the removal of the crate with the cleansed bottles and the insertion of the crate with the bottles to be cleansed. The clamping-frame is then lowered, so that the bottles are firmly clamped between the seats of the shot-cylinders and the clamping-fingers of the clamping-section of the bottle-holding frame. The water is then turned on, the machine started by operating the lever L, so that the clutch is applied to the driving-pulley, the brake-shoe released, and the machine set in motion. By the action of the driving-shaft and the intermediate mechanism a vertically-reciprocating motion is imparted to the main frame and to the bottle-holding frames, which have been turned on their axes so that the shot-cylinders are at the upper ends of the bottle-holding frames. By the manual turning motion imparted to the bottle-holding frames the springs of the reversing-chains are set to tension, so that when a predetermined number of reciprocations has been given to the main frame the unshipping mechanism is operated and the latches are withdrawn from the bottle-holding frames, so as to permit their turning through an angle of one hundred and eighty degrees under the influence of the reversing mechanisms, so that the shot-cylinders are brought to the lower part of the frames. The reversing motion is assisted by the weight of the shot in the shot-cylinders. The latches then lock the frames, and the reciprocating motion is continued until another predetermined number of reciprocations is imparted to the bottles, after which the clutch is automatically unshipped from the driving-

pulley in the manner before described, the brake applied, and the machine brought gradually to rest, so as to permit the removal of the cleaned bottles and the reinsertion of the next set of bottles to be cleaned, when the operation before described is repeated, and so on.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a bottle-washing machine, the combination, with vertical guides and a main frame moving along said guides, of mechanism for imparting vertically-reciprocating motion to said main frame, bottle-holding frames carried by said main frame and rotatable on their horizontal axes, means for clamping the bottles in said frames, mechanism for releasing at intervals said bottle-holding frames, mechanism for automatically reversing said bottle-holding frames on their axes upon releasing said frames, and mechanism for arresting the motion of the main frame when a predetermined number of reciprocations have been accomplished, substantially as set forth.

2. In a bottle-washing machine, the combination, with vertical guides and a vertically-reciprocating main frame working along said guides, of bottle-holding frames carried by said main frame and rotatable on their horizontal axes, latch devices for locking said bottle-holding frames, mechanism for withdrawing said latches after a predetermined number of reciprocations have been imparted to said main frame, mechanism for reversing said bottle-holding frames, and mechanism for automatically arresting the motion of the main frame after another predetermined number of reciprocations have been imparted to the same, substantially as set forth.

3. In a bottle-washing machine, the combination, with vertical guides, of a vertically-movable main frame on said guides, bottle-holding frames carried by said main frame and rotatable on horizontal axes, shot-cylinders supported in said bottle-holding frames, seats on said cylinders for receiving the mouths of the bottles, a clamping-frame provided with clamping-fingers adapted to press upon the bottoms of the bottles to retain them in proper relative position with the seats, and rack-and-pinion mechanisms for raising or lowering the clamping-frame on the bottles so as to permit the insertion or removal of the bottles from the bottle-holding frames, substantially as set forth.

4. In a bottle-washing machine, the combination, with a vertically-movable main frame, of means for imparting reciprocating motion to the same, bottle-holding frames supported in the main frame and rotatable on horizontal axes, means for intermittently releasing said bottle-holding frames, means for reversing them, means for relocking them in reversed position, and mechanism for intermittently arresting the motion of the main frame, substantially as set forth.

5. In a bottle-washing machine, the combination, with a vertically-movable main frame, of means for imparting reciprocating motion to the same, bottle-holding frames carried by said main frame and rotatable on their horizontal axes, latches for locking the bottle-holding frames, means for intermittently withdrawing said latches, means for reversing said bottle-holding frames after the latches have been withdrawn, means for relocking them, and means for arresting the motion of the main frame, substantially as set forth.

6. In a bottle-washing machine, the combination, with a vertically-movable main frame, of mechanism for imparting reciprocating motion to the same, bottle-holding frames supported in said main frame and rotatable on their horizontal axes, said bottle-holding frames being formed of an outer section and an inner or clamping section and of means for clamping the bottles firmly in position in said sections, means for raising the clamping-sections of the bottle-holding frames for permitting the removal or insertion of the bottles, said means consisting of slotted and exteriorly-toothed slide-plates connecting the outer and inner sections of the bottle-holding frames, intermediate pinions, hand-levers having pinions meshing with said intermediate pinions, and means for locking said actuating-levers to the outer frame-sections, substantially as set forth.

7. In a bottle-washing machine, the combination, with a vertically-movable main frame and mechanism for imparting reciprocating motion to the same, of bottle-holding frames supported in said main frame and adapted to be rotated on their axes, means for supporting the bottles in said frames, latches for locking the bottle-holding frames in position in the main frame, and means for reversing the bottle-holding frames when the latches are withdrawn from the same, said means consisting of a spring-actuated chain applied to one of the gudgeons of the bottle-holding frames, substantially as set forth.

8. In a bottle-washing machine, the combination, with a vertically-movable main frame and mechanism for imparting motion to the same, of bottle-holding frames supported in said main frame and rotatable on horizontal axes, shot-cylinders supported in said bottle-holding frames, said shot-cylinders comprising seats for the bottle-mouths screwed into the mouths of the cylinders and having outlet-openings at their base portions, central supply-nozzles for the cleansing liquid, interior perforated shot-retaining cylinders, and pipes for supplying a cleansing liquid to said nozzles and the bottles, substantially as set forth.

9. In a bottle-washing machine, the combination of a vertically-movable main frame, mechanism for imparting reciprocating motion to the same, bottle-holding frames supported in said main frame and rotatable on

their axes, means for holding the bottles in position in said frames, and shot-cylinders supported in line with the mouths of the bottles, said shot-cylinders having seats for the 5 mouths of the bottles and being provided with outlet-openings, central nozzles for supplying the cleansing liquid to the bottles, and interior shot-retaining cylinders arranged in said shot-cylinders and removable with said 10 seats, substantially as set forth.

10. In a bottle-washing machine, the combination, with a vertically-movable main frame and mechanism for imparting reciprocating motion to the same, of bottle-holding frames 15 supported in said main frame and adapted to rotate on their horizontal axes, spring-actuated latches for locking said bottle-holding frames, an unshipping-rod engaging said latches, means actuated by the driving-shaft 20 engaging at intervals said unshipping-rod and withdrawing the latches, means for producing the reversal of the bottle-holding frames

on the release of the latches and the relocking of the same by the latches, a driving-pulley on the driving-shaft, a clutch for said pulley, mechanism for withdrawing said clutch 25 after a number of reciprocations have been imparted to the main frame, a fly-wheel on the driving-shaft, a brake device for said fly-wheel, and means for withdrawing the 30 clutch from the driving-pulley and applying simultaneously the brake device to the fly-wheel so as to produce the arresting of the reciprocating motion of the main frame after an additional number of reciprocations have 35 been imparted to the same, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ANDREW PERTHOLD.

Witnesses:

PAUL GOEPEL,
HENRY SUHRBIER.