

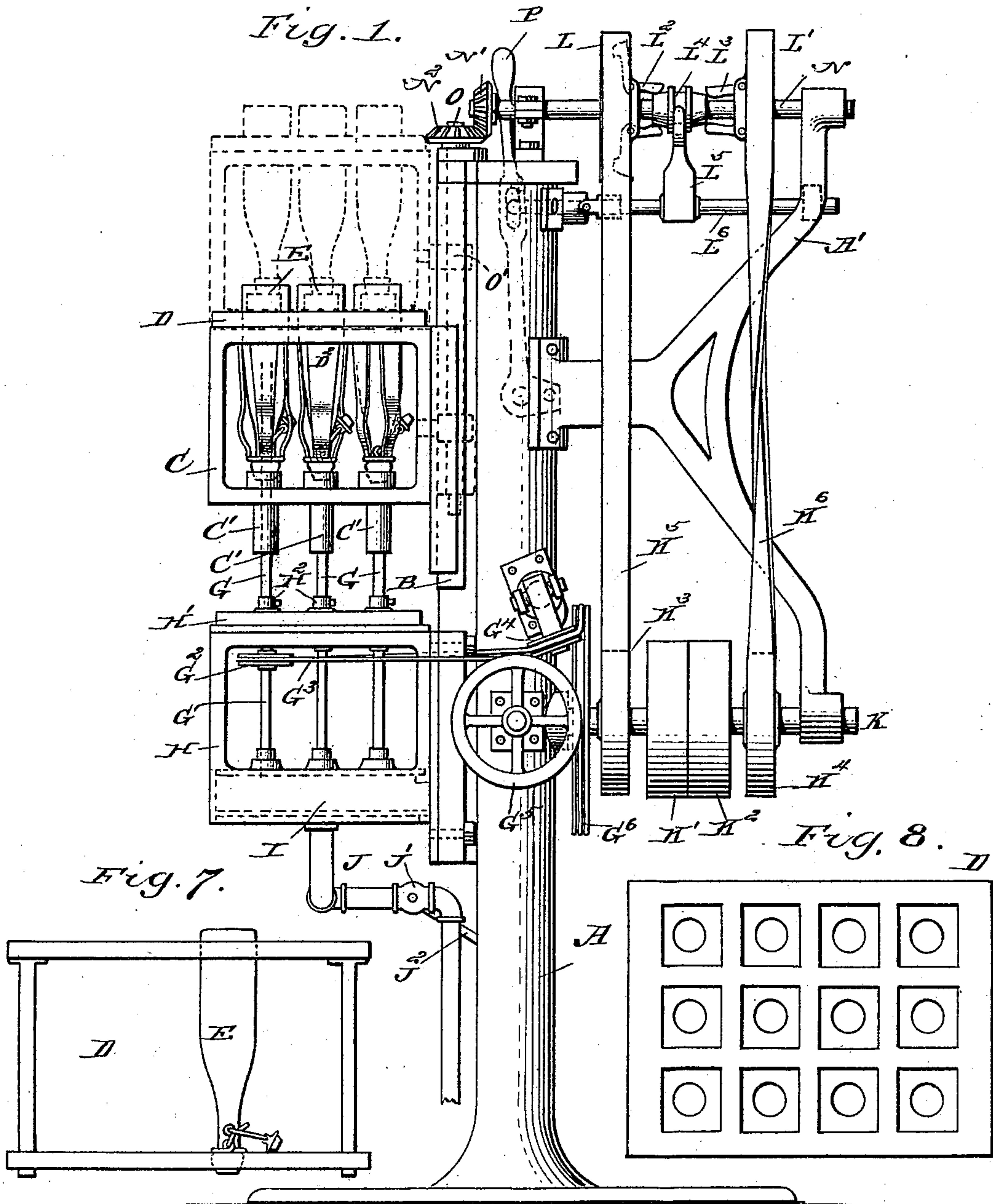
(No Model.)

3 Sheets—Sheet 1.

O. EICK.
BOTTLE WASHING MACHINE.

No. 463,360.

Patented Nov. 17, 1891.



WITNESSES:
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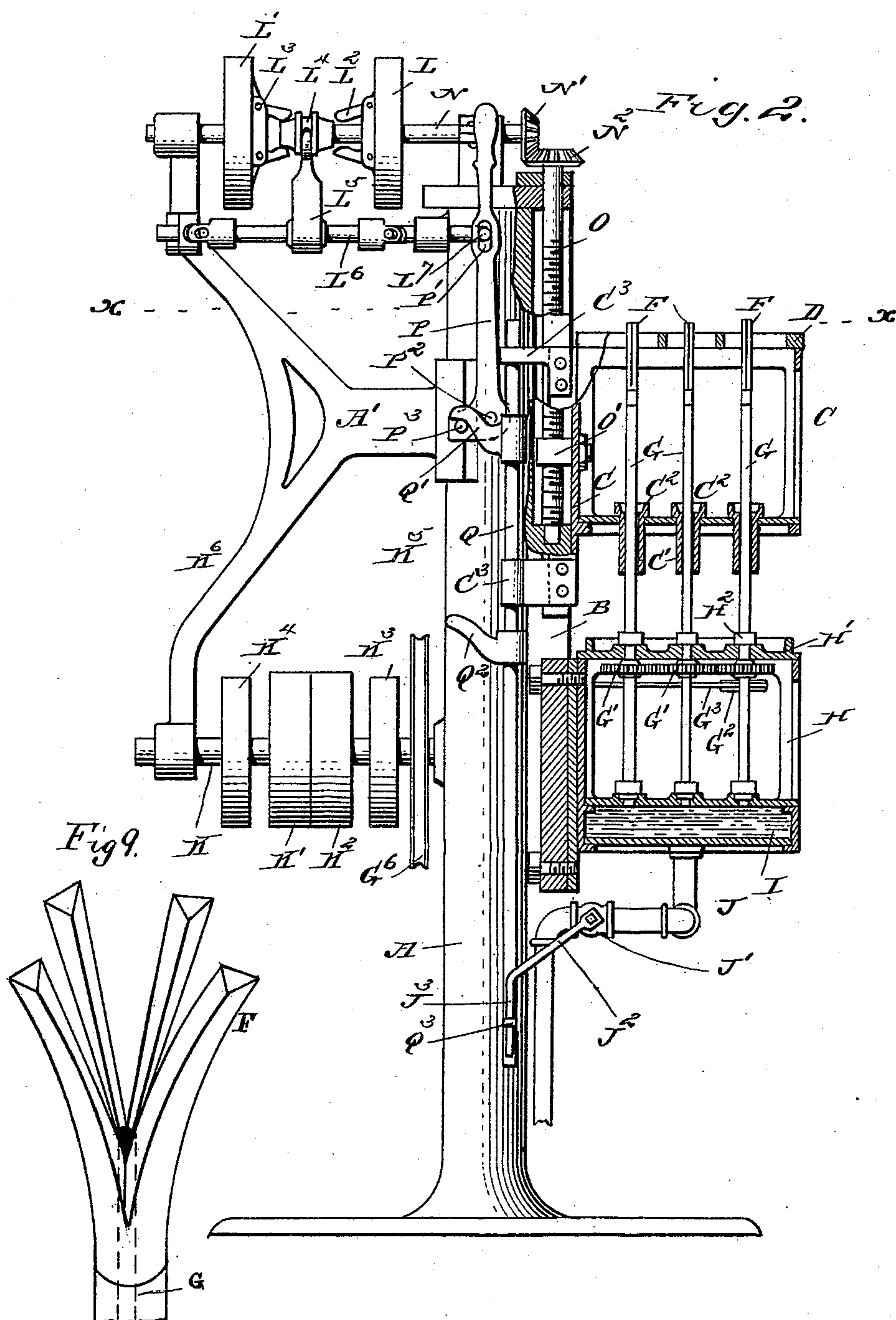
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3. Sheets—Sheet 2.

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(No Model.)

3 Sheets—Sheet 3.

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Fig. 3.

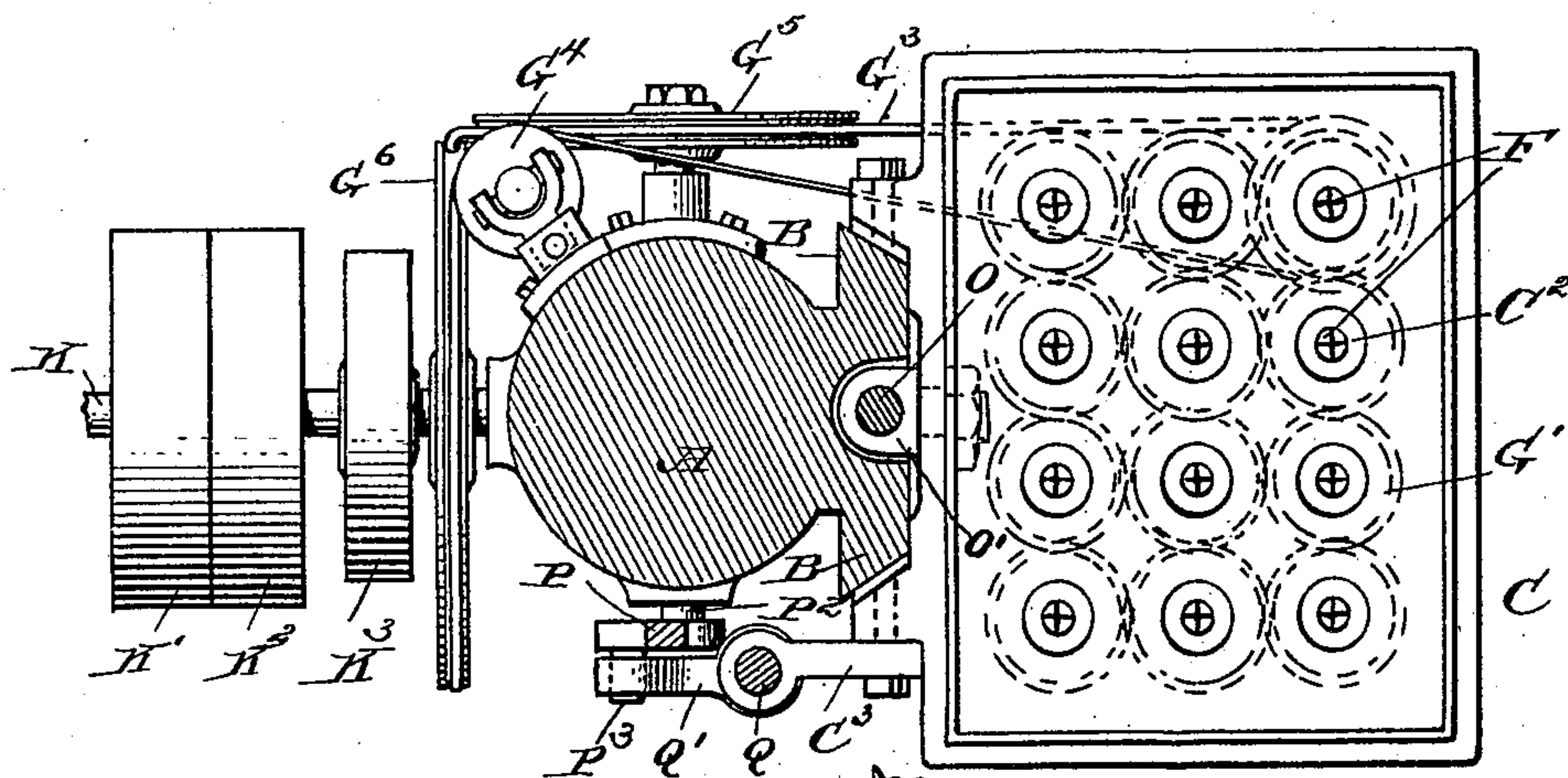


Fig. 4.

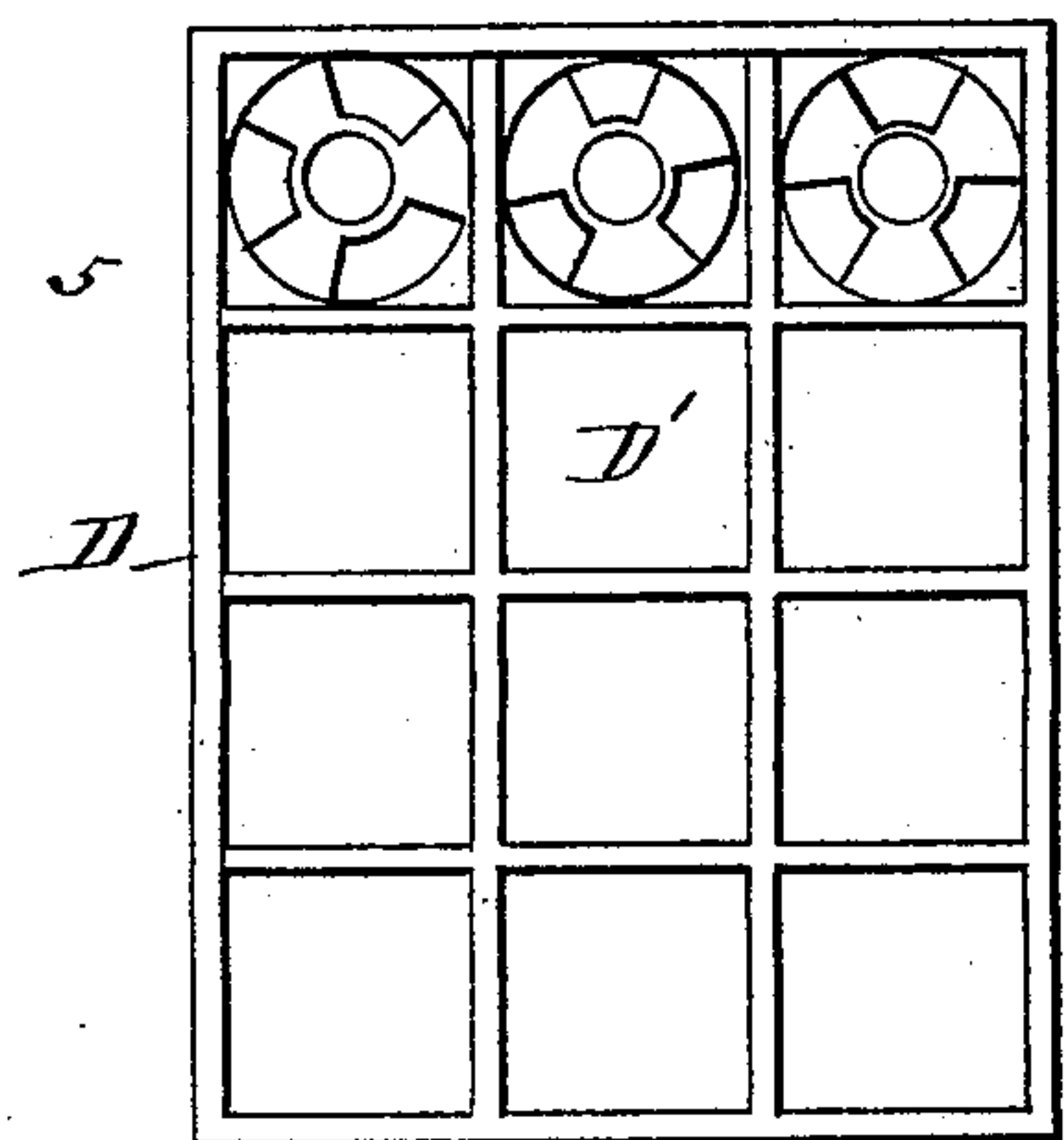


Fig. 5.

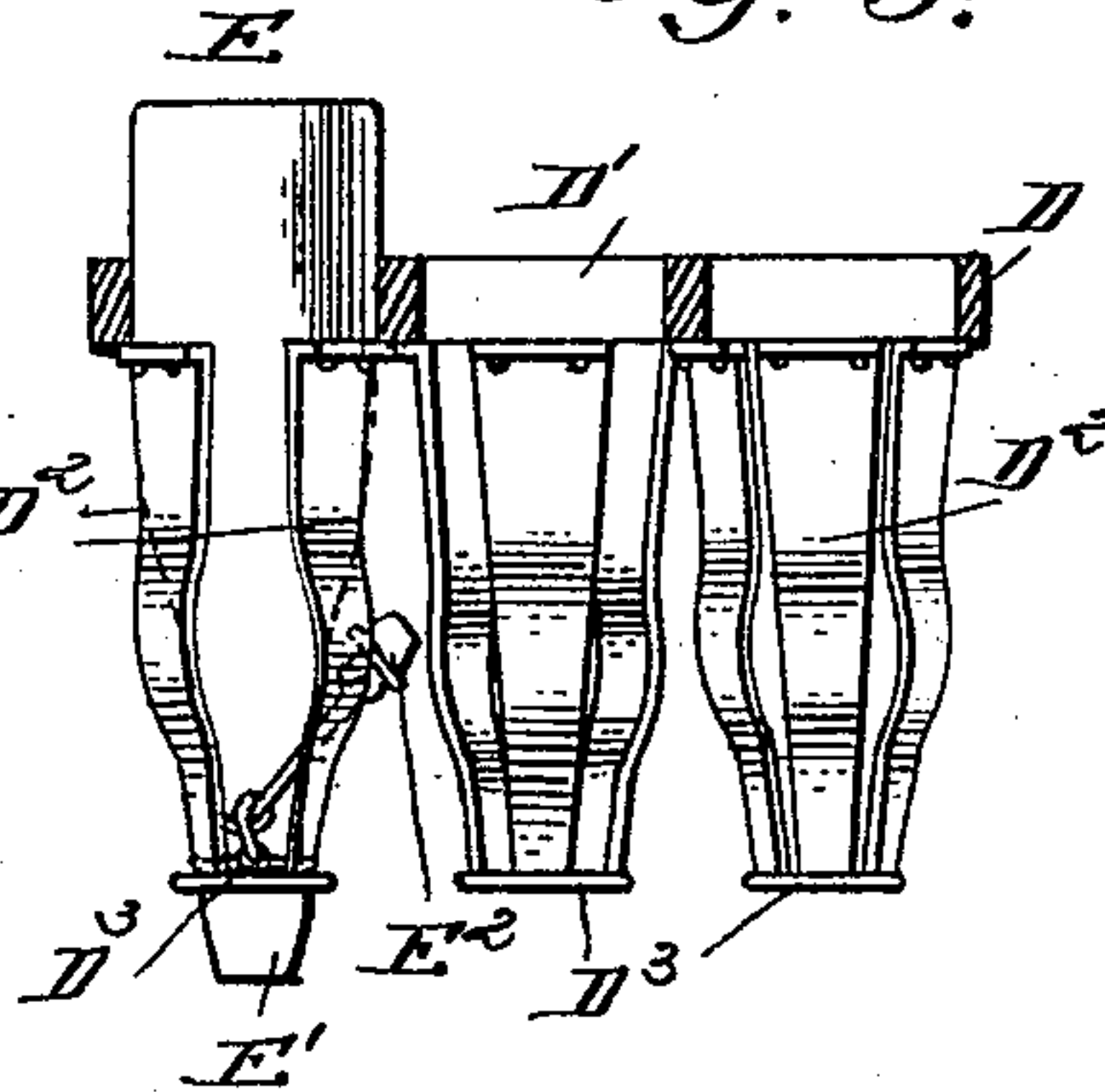
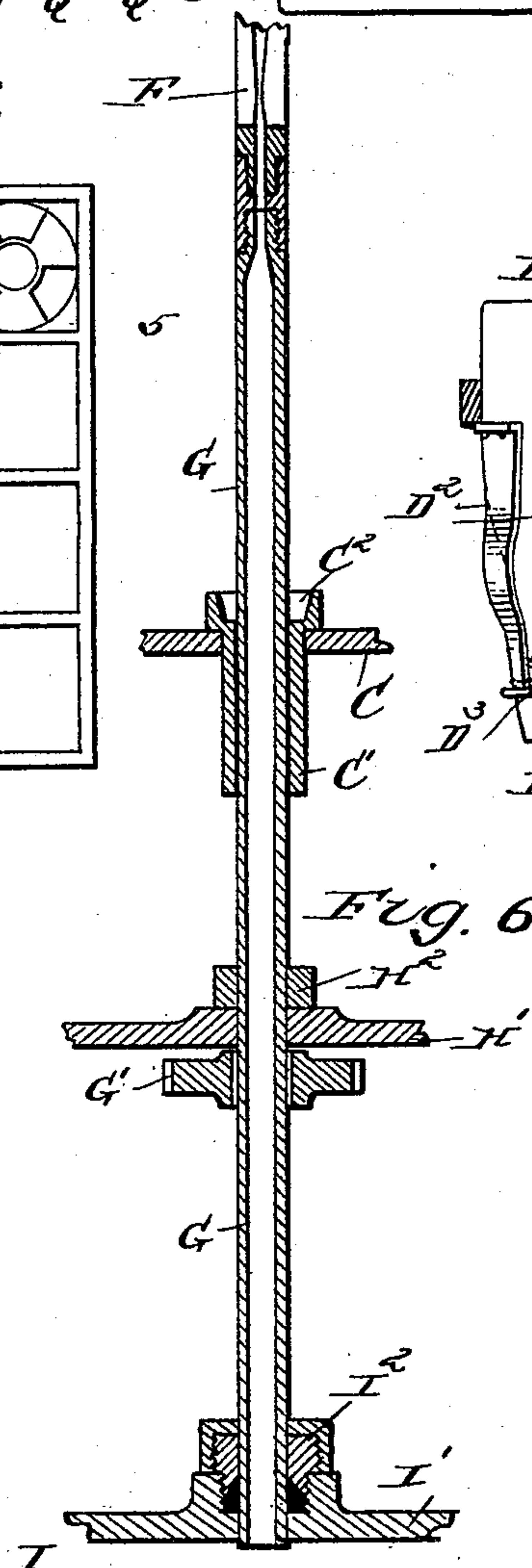


Fig. 6.



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UNITED STATES PATENT OFFICE.

OTTO EICK, OF PHILADELPHIA, PENNSYLVANIA.

BOTTLE-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 463,360, dated November 17, 1891.

Application filed July 16, 1890. Serial No. 358,918. (No model.)

To all whom it may concern:

Be it known that I, OTTO EICK, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and Improved Bottle-Washing Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved bottle-washing machine which is simple and durable in construction, very effective in operation, and adapted to wash a large number of bottles simultaneously and without the operator handling the same.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement. Fig. 2 is a rear side view of the same with parts in section. Fig. 3 is an enlarged sectional plan view of the same mainly on the line *xx* of Fig. 2. Fig. 4 is a plan view of the bottle-supporting frame or crate. Fig. 5 is a transverse section of the same. Fig. 6 is an enlarged sectional side elevation of one of the revoluble pipes and bearings for the same. Fig. 7 is a side elevation of a modified form of bottle-supporting frame or crate, and Fig. 8 is a plan view of the same. Fig. 9 shows the split nozzle in its open position.

The improved bottle-washing machine is preferably mounted on a column A, having a suitable base, so as to support the said column on the floor. On one side of the column A are formed guideways B, on which is fitted to slide vertically a frame C, on the top of which can be set a crate D, provided with a number of compartments or openings D', each adapted to receive a bottle E, placed in an inverted position, as is plainly shown in Figs. 1 and 5. On the under side of the crate D, at each opening D', are held downwardly-extending spring-plates D², connected with each other at their lower ends by a suitable ring D³ and serving to engage the sides of each bottle, so as to conveniently hold the same in place on the crate D. The neck E' of each bottle projects a short distance below

the ring D³, while the stopper E² of the bottle passes between two plates D², and is therefore held in an uppermost position, so as to be out of the way while the bottles are washed. The crate D may also be constructed as shown in Figs. 7 and 8, in which the spring-plates are dispensed with and the bottom of the crate is provided with perforations sufficiently large to just admit the head of the bottle, the stopper E resting on the upper side of the said bottom, as shown in Fig. 7. The frame C is of such height that when the crate D, filled with the bottles E, is placed on the top of the said frame the projecting necks E' of the said bottles pass into the recesses C², formed in the upper ends of the bearings C', held in the bottom of the frame C, and through which pass tubes G, provided on their upper ends with flexible nozzles F, adapted to pass into the bottles, and then the frame C is moved up and down, as hereinafter more fully described. When the frame C is in its uppermost position and the crate D is in place on the said frame, then the upper ends of the split flexible nozzles F are in line with the mouth of the bottle, ready to enter the same when the said frame C is lowered. The tubes G also have bearings in the top H' of a frame H, secured by suitable means to one side of the column A directly below the frame C. In the bottom of this frame H is formed a water-compartment I, into which open the lower ends of the several tubes G. In order to hold the latter in place, collars H² are secured on the same, said collars resting on the top H' of the frame H, as is plainly shown in Figs. 1, 2, and 6.

In order to prevent leakage from the water-compartment I, the top I' of the latter is provided around each of the tubes G with a suitable packing I², as is plainly illustrated in Fig. 6. Into the bottom of the water-compartment I opens a pipe J, provided with a valve J' and connected with a suitable source of water-supply.

The several tubes G are connected with each other by gear-wheels G', so that when one of the said tubes is rotated all the tubes rotate simultaneously and at the same rate of speed. For this purpose one of the tubes G is provided with a pulley G², over which passes a belt G³, also passing over idlers or guide-

pulleys G^4 and G^5 to a pulley G^6 , secured on the main driving-shaft K, mounted to turn in suitable bearings on the column A and in a bracket A' secured thereon.

5 On the main driving-shaft K are held the usual fast and loose pulleys K' and K^2 , and also the pulleys K^3 and K^4 , of which the former is connected by a belt K^5 with a pulley L, mounted to rotate loosely on a shaft N,
10 mounted to turn in suitable bearings in the upper end of the column A and the bracket A' . The other pulley K^4 is connected by a crossed belt K^6 with a pulley L' , also mounted to rotate loosely on the shaft N, so that when
15 the shaft K is rotated the two pulleys L and L' are rotated loosely on the shaft N, but in opposite directions.

The pulleys L and L' are provided with clutches L^2 and L^3 , adapted to be alternately
20 engaged by a double clutch L^4 , mounted to slide on and to turn with the shaft N. A shifting-arm L^5 engages the double clutch L^4 and is secured on a shaft L^6 , mounted to slide transversely in suitable bearings in the column A and the bracket A' . When the double
25 clutch L^4 engages the clutch L^2 , the rotary motion of the pulley L turns the shaft N in one direction, while when the said double clutch L^4 engages the clutch L^3 on the other pulley
30 L' the latter rotates the shaft N in an opposite direction.

The shaft N carries at its inner end a bevel gear-wheel N' , in mesh with a bevel gear-wheel N^2 , secured on the upper end of a screw-
35 rod O, arranged vertically and mounted to turn in suitable bearings centrally between the guideways B. A nut O' engages the said screw-rod O and is secured on the frame C, so that the latter, according to the position of
40 the clutch L^4 , is moved either up or down on the guideways B on the column A.

In order to shift the clutch L^4 automatically, the shaft L^6 , carrying the shifting-arm L^5 , is provided at its inner end with a pin L^7 ,
45 engaging a slot P' , arranged in a lever P, fulcrumed at P^2 on the column A. A pin P^3 extends from the lever at one side of its fulcrum P^2 and is alternately engaged by arms Q' and Q^2 , secured on a vertically-arranged rod Q,
50 held or supported on arms C^3 , fastened to the frame C, so that the said rod Q moves up and down with the frame C. The lower end of the rod Q is provided with a swiveled eye Q^3 , through which is adapted to pass the bent
55 end J^3 of an arm J^2 , secured on the stem of the valve J' in the water-supply pipe J. When the rod Q moves up and down with the frame C, the valve J' is alternately opened and closed, the bent part J^3 insuring a quick opening and
60 closing of the said valve and leaving it open until near the end of either the up or down stroke.

The operation is as follows: When the frame C is in its uppermost position, as shown
65 in dotted lines in Fig. 1, then the clutch L^4 engages the clutch L^2 of the pulley L, and when the operator now moves the driving-

belt from the loose pulley to the fast pulley on the shaft K the belt K^5 , acting on the pulley L, causes the shaft N to rotate in
70 one direction, whereby a rotary motion is transmitted by the gear-wheels N' and N^2 to the screw-rod O, and the latter, by the nut O' , moves the frame C downward. As the said frame supports the crate D, con-
75 taining the bottles E, in an inverted position, the flexible split nozzles F pass into the said bottles, and at the same time the frame C by its downward movement, carrying along the rod Q, causes the opening of the valve J' , so
80 that water flows through the supply-pipe into the compartment I, from the latter through the tubes G into the nozzles F, and from the latter into the bottles E on the downwardly-moving frame C. The rotary movement of
85 the shaft K causes a rotation of the tubes G by means of the pulleys G^6 G^2 , the belt G^3 , and the gear-wheels G' , so that the split flexible nozzles F open wide and their ends come in contact with the interior walls of the bot-
90 tles, so that the said interior walls are scraped by the nozzles and at the same time a large quantity of water is squirted into the same, thus thoroughly cleaning the bottles. As the frame C moves downward the flexible nozzles
95 F scrape the interior of the bottles and finally their bottoms, at which time the frame C is nearing its lowermost position and engages by means of the arm Q' the pin P^3 , thus pressing the lever P to one side, whereby the shaft
100 L^6 is shifted outward, and the clutch L^4 is moved by the shifting-arm L^5 out of engagement with the clutch L^2 and into engagement with the clutch L^3 on the pulley L' , whereby
105 the movement of the shaft N and the screw-rod O is reversed and the frame C moves upward. In this upward movement a second washing and scraping of the bottles takes place, and when the said frame has arrived at its uppermost position the valve J' is again
110 closed by the arm J^2 . The operator can now either stop the machine by shifting the main driving-belt from the fast pulley to the loose pulley on the main shaft K or the above-described operation can be repeated, a reversing
115 of the shaft N taking place as soon as the arm Q^2 strikes against the pin P^3 , so as to move the lever P inward, and throwing the clutch L^4 out of engagement with the clutch L^3 and into engagement with the clutch L^2 , so that
120 the frame C again commences to move downward, as previously described.

It is understood that the water rushing under pressure through the tubes G into the nozzles F readily causes the latter to open
125 and to press their flexible ends into contact with the inner walls of the bottles. As the necks E' of the several bottles are held in the recesses C^2 of the bearings C' , the water remains in the said bottles and is constantly
130 agitated by the open ends of the flexible nozzles and by the continually-incoming water, so that a thorough scraping of the inner walls of the bottles takes place.

It is understood that each set of bottles in a crate may be subjected to only one scraping on the downward movement of the frame or to several scrapings by repeating the up-and-down movement of the said frame, as above described.

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

10 1. In a bottle-washing machine, the combination, with revoluble pipes connected with the water-supply and each provided with a cleaning device at its upper or discharge end, of a frame mounted to slide and through
15 which pass the said nozzles, and a crate adapted to support bottles and held on top of the said frame, so that the said nozzles pass into the said bottles, substantially as shown and described.

20 2. In a bottle-washing machine, the combination, with revoluble pipes connected with the water-supply and each provided with a cleaning device at its upper or discharge end, of a frame mounted to slide and through
25 which pass the said cleaning devices, a removable crate adapted to support bottles and resting on top of the said frame, so that the said nozzles pass into the said bottles, and means, substantially as described, for imparting a sliding movement to the said frame, as
30 set forth.

3. In a bottle-washing machine, the combination, with revoluble pipes connected with the water-supply and each provided with a
35 flexible split nozzle, of a frame mounted to slide and through which pass the said nozzles, a crate adapted to support bottles and held on top of the said frame, so that the said nozzles pass into the said bottles, a screw-rod
40 engaging a nut on the said frame, and a shaft mounted to turn in both directions and geared with the said screw-rod, substantially as shown and described.

4. In a bottle-washing machine, the combination, with revoluble pipes connected with the water-supply and each provided with a
45 flexible split nozzle, of a frame mounted to slide and through which pass the said nozzles, a crate adapted to support bottles and held on top of the said frame, so that the said
50 nozzles pass into the said bottles, a screw-rod engaging a nut on the said frame, a shaft mounted to turn in both directions and geared with the said screw-rod, and a mechanism
55 actuated from the said frame and serving to change the direction of movement of the said shaft, so as to move the said frame up and down automatically, substantially as shown and described.

60 5. In a bottle-washing machine, the combination, with the washing-tubes, of a bottle-frame mounted to slide toward and from said tubes to permit the tubes to enter and leave the bottles, a screw-rod engaging a nut on
65 said frame, a shaft geared to said rod, and

mechanism for reversing the movement of said shaft, substantially as set forth.

6. In a bottle-washing machine, the combination, with a frame mounted to slide vertically and a crate adapted to be seated on the
70 top of the said frame and adapted to support the bottles in an inverted position, of revoluble tubes extending into the said frame, split flexible nozzles held on the said tubes and adapted to pass into the bottles, and a water-
75 supply compartment connected with the said tubes, substantially as shown and described.

7. In a bottle-washing machine, the combination, with a frame mounted to slide vertically and a crate adapted to be seated on the
80 top of the said frame and adapted to support the bottles in an inverted position, of revoluble tubes extending into the said frame, split flexible nozzles held on the said tubes and adapted to pass into the bottles, a water-sup-
85 ply compartment connected with the said tubes, and a pipe connected with the water-supply discharging into the said water-compartment and provided with a valve automatically controlled by the movement of the said
90 frame, substantially as shown and described.

8. In a bottle-washing machine, the combination, with the washing-tubes, of a bottle-frame provided with a nut and arms or lugs and mounted to slide toward and from the
95 said tubes to permit the tubes to enter and leave the bottles, a screw-rod passing through the said nut, an operating-shaft geared to the said rod, a reversing mechanism for said
100 shaft, and a lever connected with the reversing mechanism and in the path of the said two arms or lugs, substantially as set forth.

9. In a bottle-washing machine, the combination, with a frame mounted to slide vertically and adapted to support the bottles, of a
105 nut secured on the said frame, a screw-rod engaging the said nut and mounted to turn, a shaft mounted to turn and geared with the said screw-rod, clutch-pulleys held loosely on the said shaft and rotated in opposite direc-
110 tions, and a double clutch adapted to engage alternately the said clutch-pulleys and automatically controlled by the movement of the said frame, substantially as shown and de-
115 scribed.

10. In a bottle-washing machine, the combination, with the washing-tubes and a supply-pipe therefor provided with a valve, of a slid-
ing bottle-frame, mechanism for operating the frame and having a reversing-gear actu-
120 ated automatically thereby, and connections between the sliding frame and the said valve for automatically opening and closing said valve, substantially as set forth.

11. In a bottle-washing machine, the combi-
125 nation, with the washing-tubes and a water-supply pipe therefor having a valve provided with an operating-arm, of a sliding bottle-frame provided with a nut and with a rod connected to the said valve and having two
130

arms or lugs, a screw-rod engaging said nut, a power-shaft geared to the screw-rod, and a reversing mechanism for said power-shaft having an operating-lever provided with a
5 lug or pin projecting into the path of the said two arms, substantially as set forth.

12. In a bottle-washing machine, the combination, with a frame mounted to slide and provided with bearings having recesses in
10 the top, of revoluble pipes passing through said bearings and each provided with a nozzle, and a crate held on top of the said frame and supporting the bottles in an inverted position, the said bottles resting with their
15 necks in the recesses of the said bearings,

and the said pipes being adapted to pass into the said bottles, substantially as shown and described.

13. In a bottle-washing machine, a crate adapted to support the bottles and provided 20 with a number of openings, spring-plates projecting from the said crate at the under side of each opening, and a ring for connecting the said plates of each opening, substantially as shown and described.

OTTO EICK.

Witnesses:

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I. DANIEL EBY.