(No Model.) 2 Sheets—Sheet 1.

W. COWLES.

BOTTLE WASHING MACHINE.

No. 286,394. Patented Oct. 9, 1883.

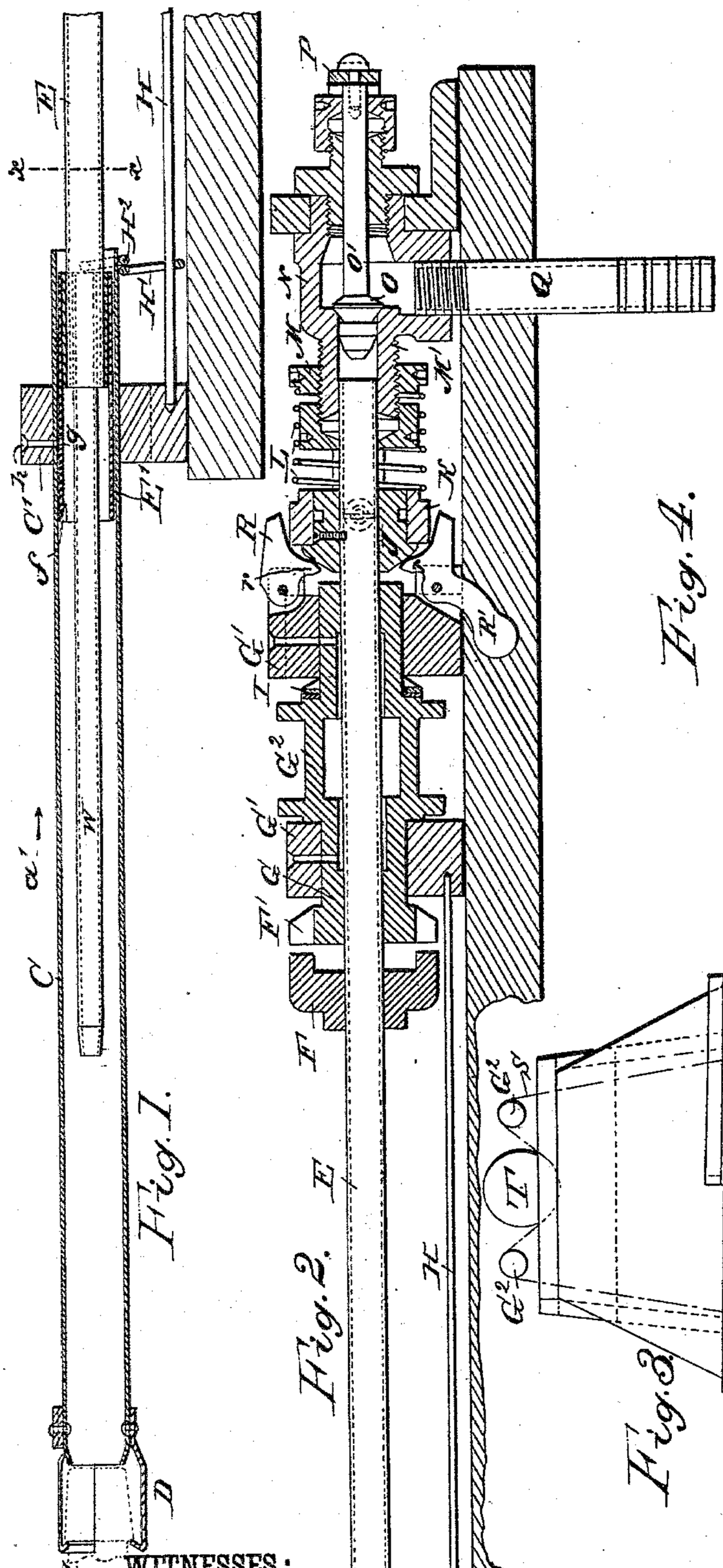

Fig. 1.

Fig. 2.

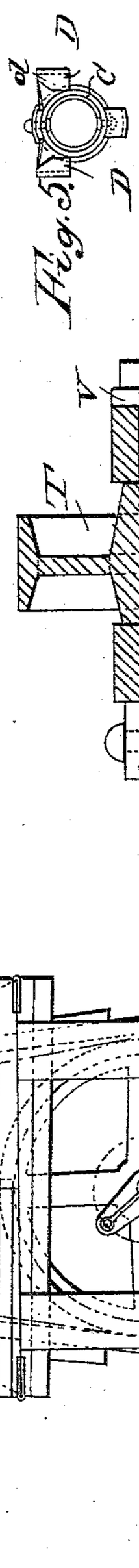

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

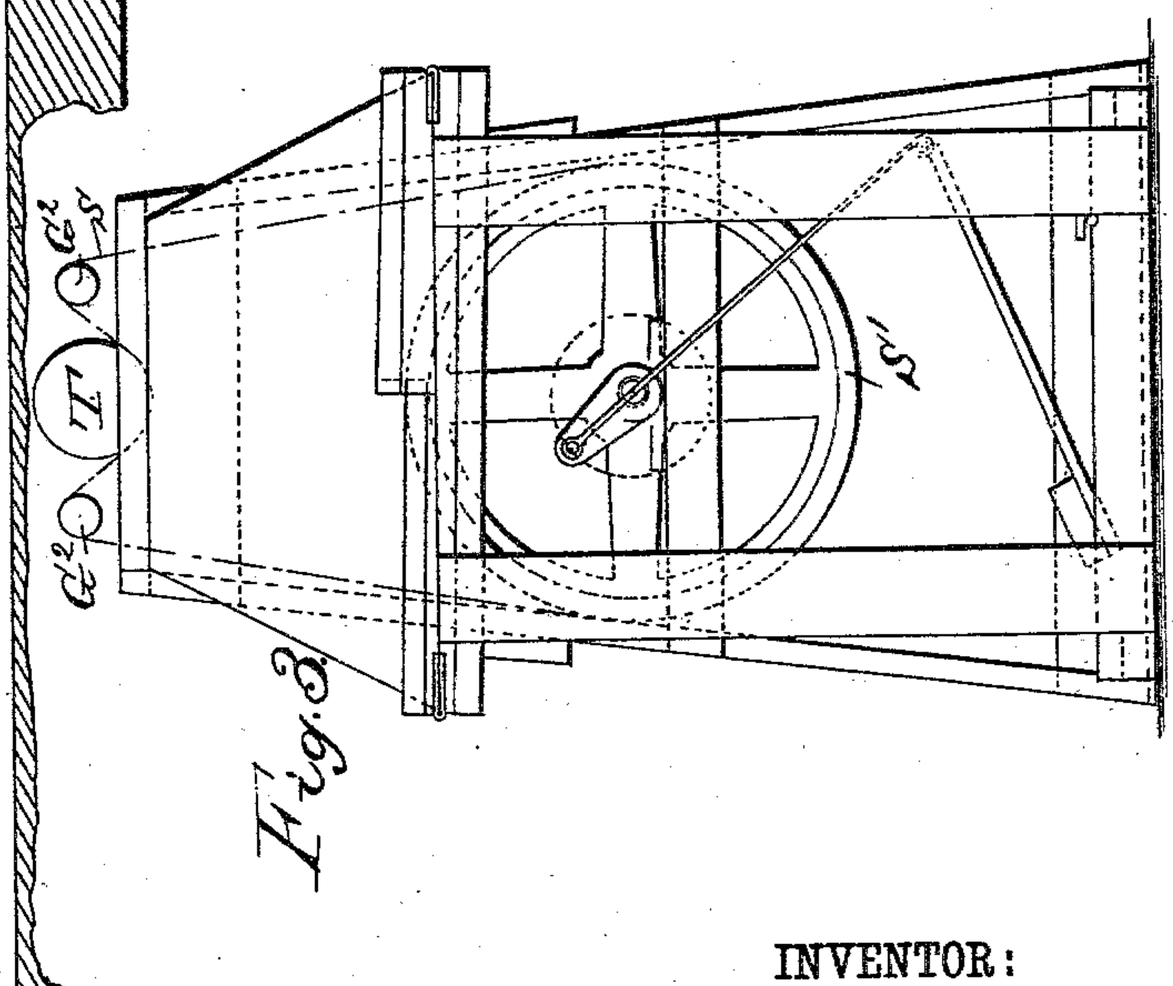

Fig. 8.

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(No Model.) 2 Sheets—Sheet 2.

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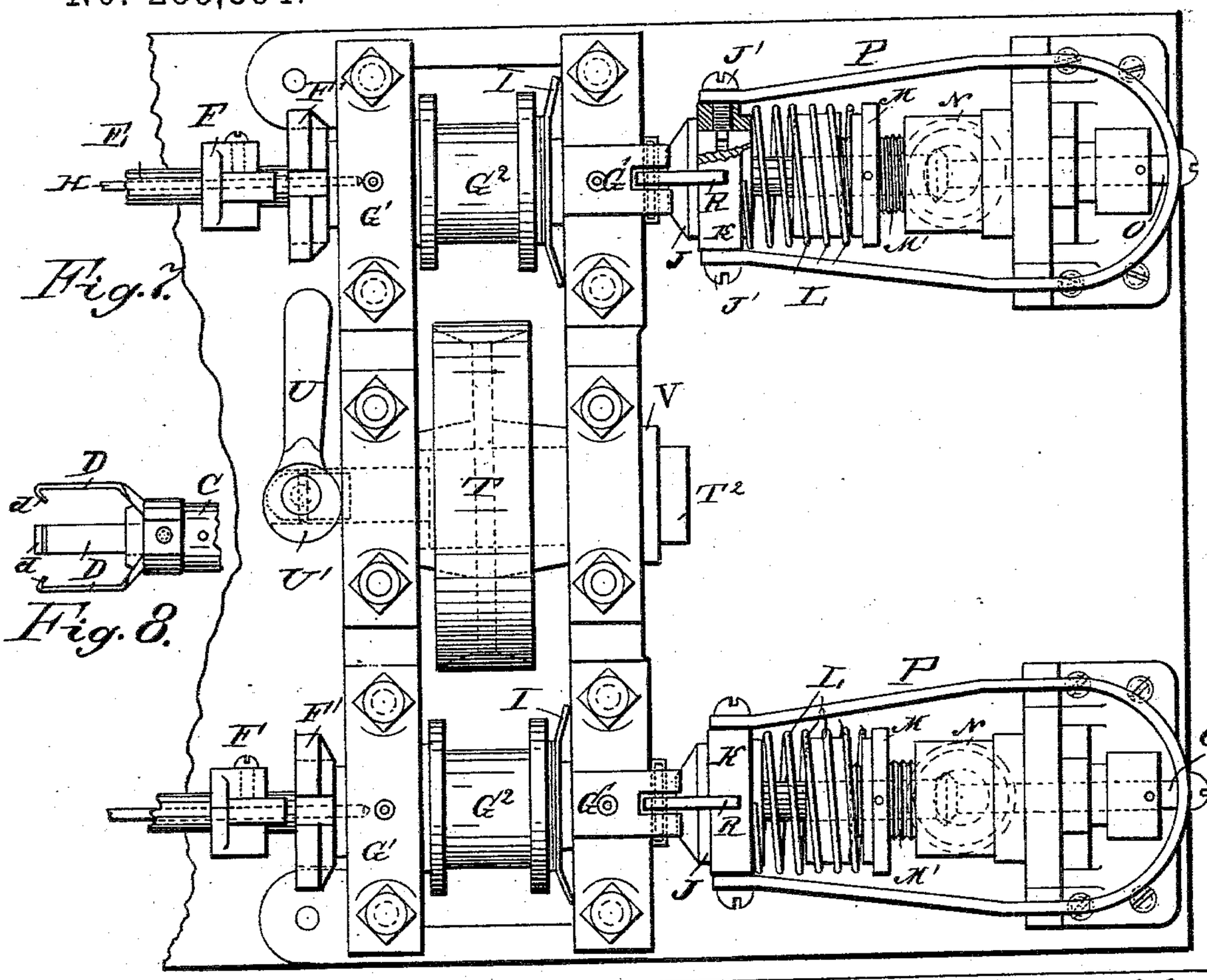

Fig. 1.

Fig. 8.

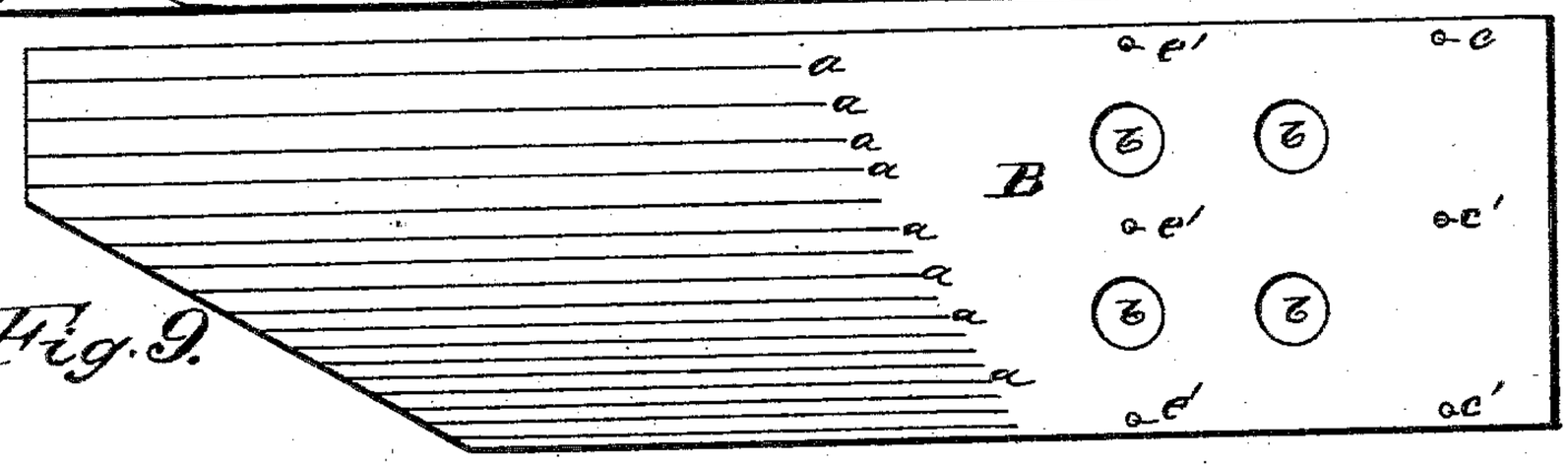

Fig. 9.

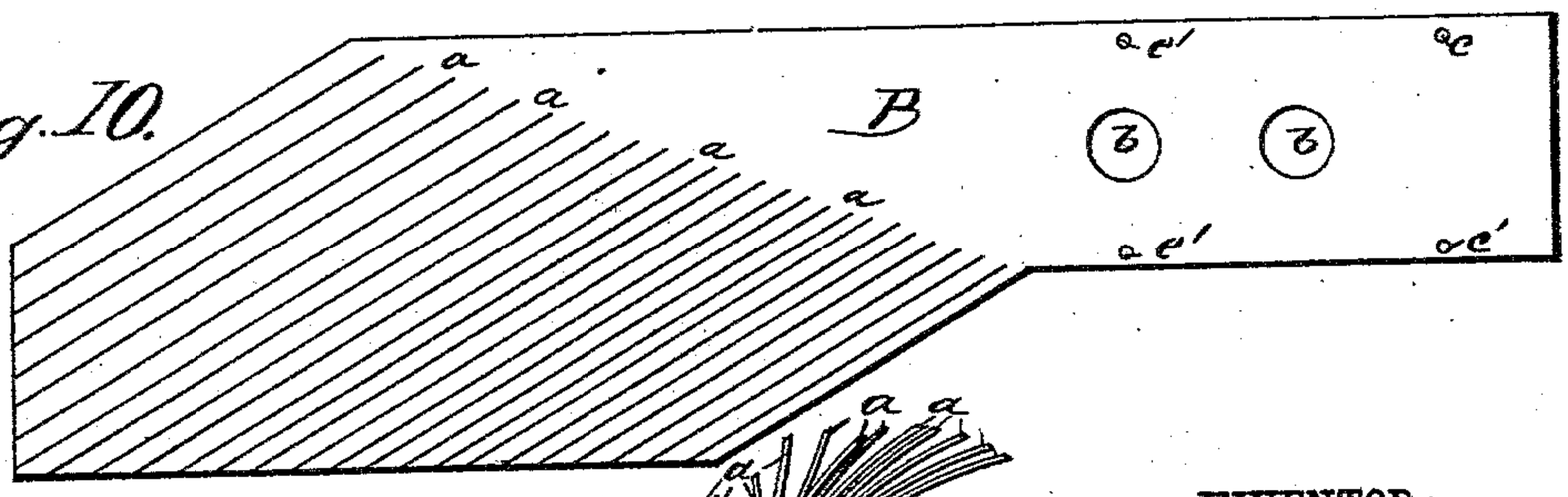

Fig. 10.

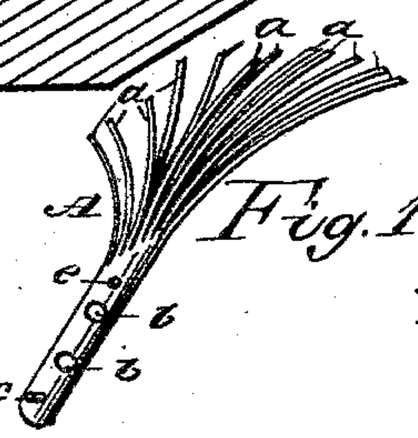

Fig. 11.

Fig. 12.

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UNITED STATES PATENT OFFICE.

WILLIAM COWLES, OF NEWBURG, NEW YORK, ASSIGNOR OF ONE-HALF TO NATHANIEL TERRY BACON, OF NORWICH, CONNECTICUT.

BOTTLE-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 286,394, dated October 9, 1883.

Application filed October 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, WM. COWLES, of Newburg, in the county of Orange and State of New York, have invented a new and Improved Bottle-Washing Machine, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved machine for rapidly and thoroughly cleaning and washing bottles, and rinsing them out before they are removed from the machine.

The invention consists of the sundry combinations and arrangements of parts, substantially as hereinafter fully set forth and claimed.

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

Figures 1 and 2 show a longitudinal sectional elevation of my improved bottle-cleaning machine. Fig. 3 is a front end elevation of the same and its support. Fig. 4 is a cross-sectional elevation of the belt-tension pulley. Fig. 5 is a front end elevation of the sliding tube for receiving the head of the bottle. Fig. 6 is a cross-sectional elevation of the same on the line *x x*, Fig. 1. Fig. 7 is a plan view of the rear end of the machine, showing the arrangement of the pulleys and valves. Fig. 8 is a plan view of the front end of the sliding tube for receiving the bottle-head. Fig. 9 is the blank from which the brush is made. Fig. 10 is a plan view of a modification of the same. Fig. 11 is an end elevation of the base end of the brush. Fig. 12 is a perspective view of the brush on a smaller scale.

I use a brush of a very peculiar construction, which consists of a tube provided at one end with a series of curved strips of various lengths, which project from the end of the tube radially and upwardly on curved lines, in the manner of the branches of a palm-tree, as shown in Fig. 12. The brush A is formed of a longitudinal strip, B, of metal, preferably of steel, which has one end beveled off, and at the beveled end is provided with longitudinal slits, which form a series of longitudinal tongues, *a*. The other end of the strip is provided with a series of apertures, *b b*, and at one edge with a fixed pintle, *c*, and with one or two apertures, *c'*, which are on a straight transverse line with the pintle *c*, as shown. The strip B is rolled up to form a tube in such a manner that the pintle *c* passes into the apertures *c'* which coincide, whereby the base end of the tube will be held together. The two rows of apertures *b b* coincide or cover each other, and a small rivet, *e*, is driven through rivet-apertures *e'* in the strip B. If desired, the slits or cuts forming the tongues *a* need not be made parallel with the longitudinal edges of the strip B, but can be made diagonal to the same, as shown in Fig. 10. When the strip B has been rolled up to form the tube, the tongues *a* will project upward and outward from the upper end of the said brush on curved lines, and as the end of the strip B is beveled, the said tongues will be of different lengths. A tube, C, which is adapted to slide parallel to its longitudinal axis in a bearing-block, C', resting on a suitable support, is provided at its outer end, which is slightly tapered or contracted, with three spring-prongs, D, which are provided at their ends with hooks *d*, inclined inwardly and toward the end of the tube C, as shown in Figs. 1, 5, and 8. The lower prong D is on the longitudinal central line of the tube C, and the two upper prongs D are at the sides of the same, so that a bottle-head can be admitted between the said prongs from above by simply placing it between the two upper prongs, so that it will rest upon the middle lower prong. The hooks *d* catch behind the lower edge of the head of the bottle and hold the same between the prongs D. A rotating tube, E, projects into the rear end of the tube C, and is provided within the said rear end of the tube C with a sleeve, E', which is securely fastened to the tube E and rests loosely but closely against the inner surface of the tube C. The said sleeve is provided in its outer edge with a beveled groove, *f*, and a short distance back of the said outer edge it is provided with an aperture, *g*, which is adapted to receive the pintle *c* of the brush A. A vertical aperture, *h*, is formed in the bearing C' directly above the aperture *g* in the sleeve E'. A male clutch, F, is rigidly mounted or keyed on the tube E near the end opposite the one passing into the tube C, and adjoining to the said male clutch

F a sleeve, G, is loosely mounted on the tube E, the said sleeve being journaled in the journal-blocks G′ G′ on the platform of the machine. The said sleeve G is provided with a belt-pulley, G^2, and at the end adjoining the male clutch F with a female clutch, F′. A rod, H, passes from the bearing-block C′ to the bearing-block G′, and also passes through a loop, H′, formed by a transverse wire, H^2, which is attached to the rear end of the tube C, whereby the said tube will be prevented from turning on its longitudinal axis, but can be moved longitudinally. A wagon-spring, I, resting against the pulley G^2, presses the sleeve G in the direction toward the male clutch F. A cylindrical rabbeted block, J, rigidly mounted on the tube E, is surrounded by a ring, K, which rests against the shoulder of the said block J. A spiral spring, L, rests against the shoulder of said ring K, and against the shoulder of a rabbet in a ring, M, which is screwed on the threaded tubular projection M′ of a valve-box, N, which is fixed on the platform of the machine. The end of the tube E passes into the end of the tubular projection M′, and a close joint is formed by a stuffing-box on the end of the said tubular projection. A valve, O, fitting in the inner end of the tubular projection M′ of the valve-box N, is attached to the inner end of a valve-rod, O′, the outer end of which is attached to a U-shaped frame, P, the ends of the shanks of which are attached to the ring K, surrounding the block J, by means of screws J′, projecting into a groove in the said block J, the said valve-rod O′ being suitably packed to form a close joint. The water is conducted into the valve-box N through a pipe, Q. A cam-latch, R, is pivoted on the top of the bearing-block G′ adjoining the cylindrical block J on the tube E, and a cam-latch, R′, is pivoted to the bottom of the said bearing-block. A weighted arm of the said cam-latch R′ presses the end of the said cam-latch upward, for a purpose that will be fully set forth hereinafter. Both latches R and R′ are provided with tongues *r*, projecting toward the tube E. Two of the above-described devices are mounted parallel with each other on the same base or table, as shown in Fig. 7, and a belt, S, passes over the two pulleys G^2 and around a driving-pulley, S′, which can be operated by a treadle, or by any other suitable motor. The said belt S also passes under a tension-pulley, T, which is loosely mounted on an eccentric part, T′, of a shaft, T^2, which shaft is provided at one end with a pivoted handle, U, having eccentric disks U′ at its pivoted end. A rubber cushion, V, is interposed between a head on the end of the shaft T^2 and the bearing of the shaft T^2, for purposes which will also be described hereinafter. A tube, W, which is of less diameter than the tube E, projects from the end of the same into the tube C, as shown in Fig. 1.

The operation is as follows: As the operation of each half of the machine is the same, the operation of only one of the above-described devices will be shown. The butt or base end of the brush A is passed into the tube C until the pintle *c*, which passes through the beveled groove *f*, catches in the aperture *g* of the sleeve E′, and is thus held in the same in such a manner that it will rotate therewith. The head of a bottle is then passed between the prongs D, and by pushing upon the end of the bottle the tube C is pushed in the direction of the arrow *a*′, whereby the spring-tongues of the brush, which are held together by the tube C, will pass into the neck and body of the bottle at the same time with the tube W, which is contained within the brush. The rear end of the tube C strikes against the male clutch F, and pushes the same and the tube E, on which it is mounted, in the direction of the arrow *a*′, so that the male clutch engages with the female clutch at the end of the sleeve G, which sleeve is continually rotated by the belt S, and the result is that as soon as the clutches are engaged the tube E will also be rotated, and the brush will be whirled about in the bottle, and the centrifugal force throws the spring-tongues against the inner surfaces of the bottle. If the tube E is moved in the direction of the arrow *a*′, the U-shaped frame P will be moved in the same direction, and will draw the valve-rod O′ and the valve O in the direction of the arrow *a*′, whereby the inner end of the tubular projection M′ in the valve-box N will be opened, permitting the water to flow through the pipe E and the pipe W into the bottle, which is thus thoroughly rinsed and washed. The water can pass through the apertures *b b* of the brush A. For the purpose of locking the tube E in the above-described position, I have provided the cam-latches R and R′, for by the movement of the tube E the cylindrical block J on the same will also be moved in the direction of the arrow *a*′, thus permitting the free ends of the cam-latches R and R′ to be moved by gravity toward the central axis of the tube E, and thus causing the free ends of the cam-latches to catch on the edge of the cam-ring K. As soon as the cam-latches are in this position, the valve O will be held opened. If the suppply of water is to be shut off and the machine stopped, the tube E is suddenly and quickly pushed a short distance farther in the direction of the arrow *a*′, whereby the wagon-spring I will be compressed, and the end of the sleeve G will strike against the tongues *r* of the cam-latches R and R′ and will suddenly throw the said latches outward. Before the same can be moved by gravity toward the tube E again, the spring L moves the block J and the tube E in the inverse direction of the arrow *a*′, and thereby holds the cam-latches R and R′ outward, and at the same time the frame P is moved in the inverse direction of the arrow *a*′, whereby the valve O will be closed and the supply of water will be shut off. When the tube E is sud-

denly moved in the direction of the arrow *a'*, for the purpose of stopping the supply of water, the valve O will be opened farther than it has been during the regular supply, for a moment, and will thus allow a larger quantity of water to pass through the tube E, which greater quantity of water flushes the bottle before it is removed. The bottle is removed from the end of the tube C by pulling the bottle in the inverse direction of the arrow *a'*, whereby the tube C will be moved into the position shown in Fig. 1, and then the spring-prongs will be separated to release the head of the bottle. If the brush is to be removed from the tube C, a wire or rod must be passed through the apertures *h* and *g* in the bearings C' and sleeve E, to press down the pintle *c* and permit of drawing the brush out of the tube. By means of the handle U, the shaft T^2 can be so adjusted that the eccentric part T' can be projected upward or downward, as desired. If it projects upward, the belt S runs loosely over the pulleys G^2, and the machine will not operate; but if the eccentric part T' is turned downward, the wheel T will be pressed on the belt S, and will produce sufficient friction on the belt to rotate the pulleys G^2. After the shaft T^2 has been adjusted in the desired position in regard to its eccentric part, the shaft is locked in the desired position by turning the lever U away from the bearing of the shaft, for thereby the eccentric part U' of the lever U will be pressed against the bearing, and will slightly draw the shaft in the direction of its length, and will compress the cushion V, the tension of which holds the shaft in the desired position. Two bottles can be washed at the same time by means of this machine.

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

1. The combination, with a rotary water-feed tube, of a brush made of a slitted sheet of metal and attached to one end of the feed-tube, substantially as herein shown and described, whereby the prongs of the brush will be thrown outward by the centrifugal force when the water-feed tube is rotated.

2. The combination, with a rotary water-feed tube, of the brush having a series of prongs and a tubular handle, said prongs and handle being made from the same sheet of metal, substantially as and for the purpose set forth.

3. In a bottle-washing machine, the telescoped pipes, one adapted to have the head of a bottle applied thereto, and to act upon the other pipe, in combination with a valve, said valve being connected to a spring-actuated collar or sleeve, and cam-latches adapted to act upon the latter, and by the action of which the valve is held open, substantially as set forth.

4. In a bottle-washing machine, the telescoped pipes, one adapted to act upon the other, in combination with a valve, said valve being connected to a spring-actuated collar or ring, a cam-latch or cam-latches, a sleeve, and a spring, by the compression or action of which the sleeve is caused to disengage the cam-latch or cam-latches from the said collar or ring, whereby upon imparting a sudden movement to the pipes the valve will be closed, and a temporary increased flow of water will be admitted to the bottle to flush it, substantially as described.

5. The combination, with a rotary feed-tube, of a tube adapted to slide over the latter and to receive the head of the bottle, spring-arms on the end of the sliding tube for holding the head of the bottle, and devices for rotating the water-feed tube, substantially as shown and described, and for the purpose set forth.

6. In a bottle-cleaning machine, the combination, with a rotary water-feed pipe, of a sliding tube adapted to receive and hold the head of the bottle to be cleaned, and of a rotary brush within the said sliding tube, and held on the rotating water-feed tube, substantially as herein shown and described, and for the purpose set forth.

7. In a bottle-cleaning machine, the combination, with the rotating water-feed tube E, of the sliding tube C, the spring-prongs D, attached to the outer end of the same, and provided with inwardly-projecting hooks *d*, and devices for rotating the tube E, substantially as herein shown and described, and for the purpose set forth.

8. In a bottle-cleaning machine, the combination, with the rotary water-feed tube E, of the sliding tube C, and the spring-prongs D, of which the upper ones are at the sides of the outer end of the tube C, and the bottom one is on the central longitudinal plane of the tube C, at the outer end and bottom of the same, substantially as herein shown and described, for the purpose of permitting the placing of a bottle between the said prongs or arms from above.

9. In a bottle-cleaning machine, the combination, with a rotary water-feed tube, E, of the sliding tube C, the sleeve E', attached to the tube E, and provided with a beveled groove, *f*, and an aperture, *g*, and of devices for rotating the tube E, substantially as herein shown and described, and for the purpose set forth.

10. In a bottle-cleaning machine of that class employing a bottle-holding tube and a revolving water-feed tube, the combination therewith of the wire loop-frames H' H^2 and the wire rod H, substantially as herein shown and described, and for the purpose of preventing the bottle-holding tube from being rotated, and at the same time permitting longitudinal movement of the same.

11. In a bottle-cleaning machine, the combination, with the tube E, of the sleeve G, provided with a female clutch, F', the male clutch F on the tube E, the block J, rigidly mounted on the tube E, the ring K on the

block J, the U-shaped frame P, the valve O, and the valve-rod O′, substantially as herein shown and described, and for the purpose set forth.

12. In a bottle-cleaning machine, the combination, with the tube E, of the clutches F F′, the block J, the ring K, the frame P, the valve-rod O′, the valve O, and the cam-latches R and R′, substantially as herein shown and described, and for the purpose set forth.

13. In a bottle-cleaning machine, the combination, with the tube E, the male clutch F, the sleeve G, provided with the pulley G^2, and the female clutch F′, of the block J, the ring K, the frame P, the valve O, the valve rod O′, and the cam-latches R and R′, provided with the tongues *r r*, projecting toward the tube E, substantially as herein shown and described, and for the purpose set forth.

14. In a bottle-cleaning machine, the combination, with the tube E, of the clutches F F′, the block J, the ring K, the frame P, the valve-rod O′, the valve O, and the spring L, substantially as herein shown and described, and for the purpose set forth.

15. In a bottle-cleaning machine, the combination, with the tube E, of the clutch F, the sleeve G, provided with the clutch F′, the spring I, the cam-latches R and R′, provided with tongues *r*, the block J, the ring K, the spring L, the frame P, the rod O′, and the valve O, substantially as herein shown and described, and for the purpose set forth.

16. In a bottle-cleaning machine, the combination, with the rotating water-feed tube E, of the sliding tube C, and a tube, W, projecting from the end of the tube E into the tube C, substantially as herein shown and described, and for the purpose set forth.

17. The brush for cleaning bottles, made, substantially as herein shown and described, of a strip of metal having diagonal slits at one end, which strip is rolled upon its longitudinal axis to form a tube, substantially as herein shown and described, and for the purpose set forth.

18. A brush for cleaning bottles, made of a strip, B, having one end provided with slits forming tongues *a*, and the other end provided with a pintle, *c*, which enters apertures *c′* to hold the strip when rolled to form a tube, substantially as herein shown and described, and for the purpose set forth.

19. A brush for cleaning bottles, made of a strip, B, having one end provided with slits forming tongues *a*, and the other end provided with a pintle, *c*, which enters apertures *c′* to hold the strip when rolled to form a tube, and with apertures *b b*, substantially as herein shown and described, and for the purpose set forth.

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Witnesses:
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