No. 803,850. PATENTED NOV. 7. 1905.

J. A. PRINCE.

BOTTLE WASHING MACHINE.

APPLICATION FILED NOV. 29, 1904.

3 SHEETS—SHEET 1.

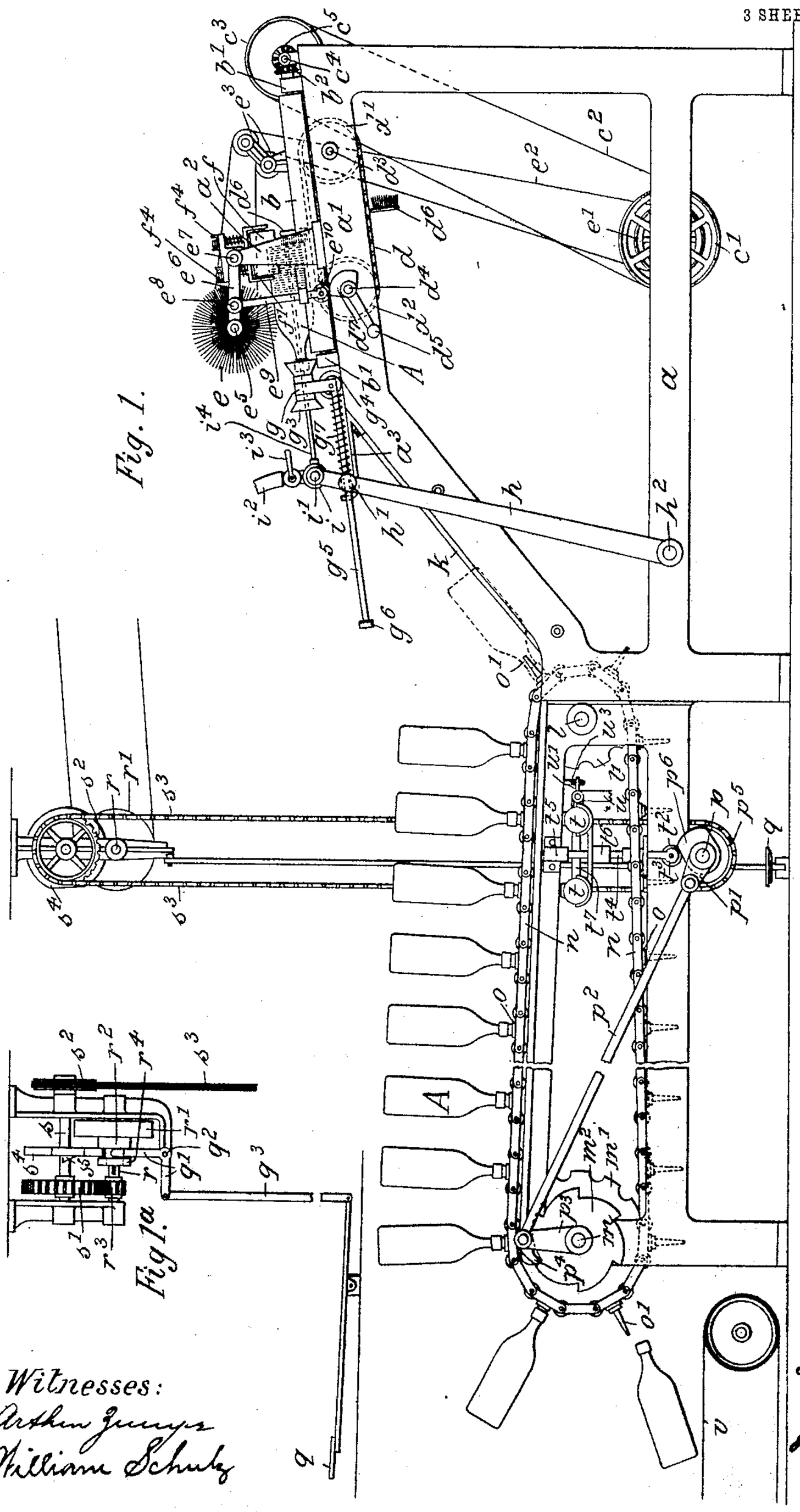

Fig. 1.

Fig. 1a.

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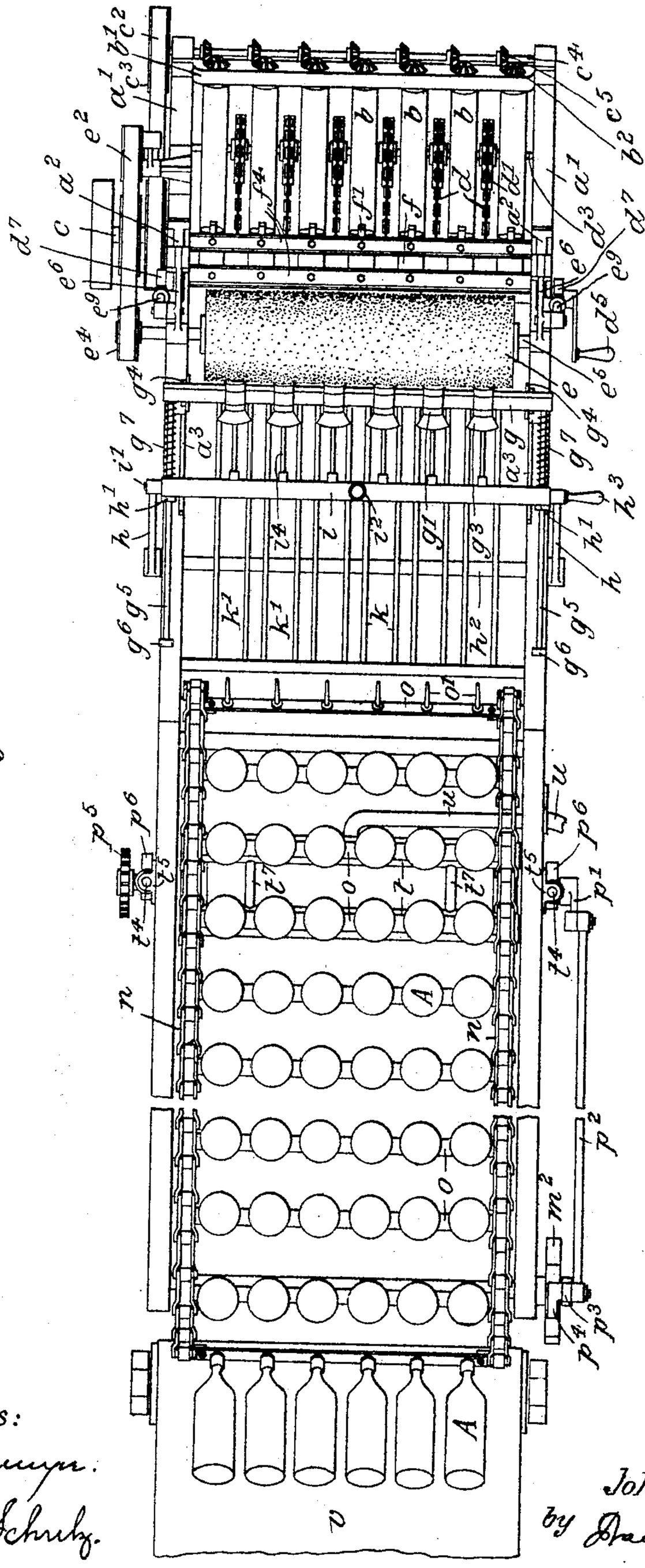
3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

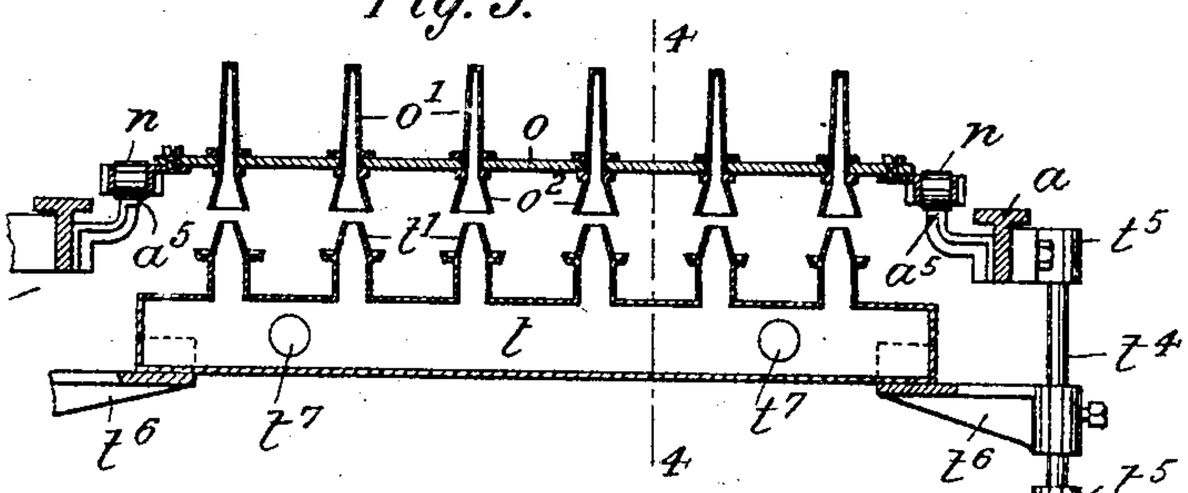


Fig. 4.

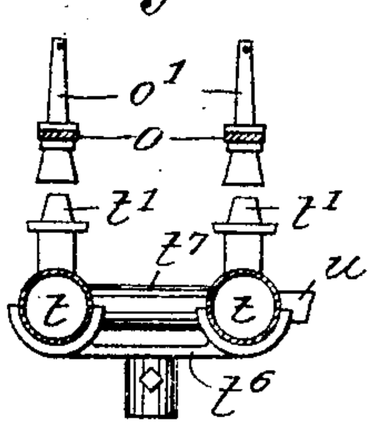


Fig. 5.

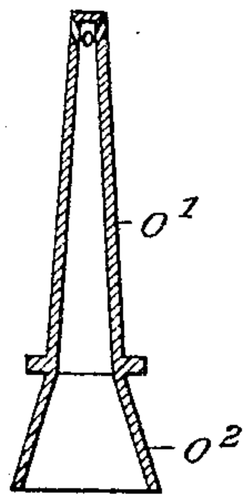


Fig. 6.

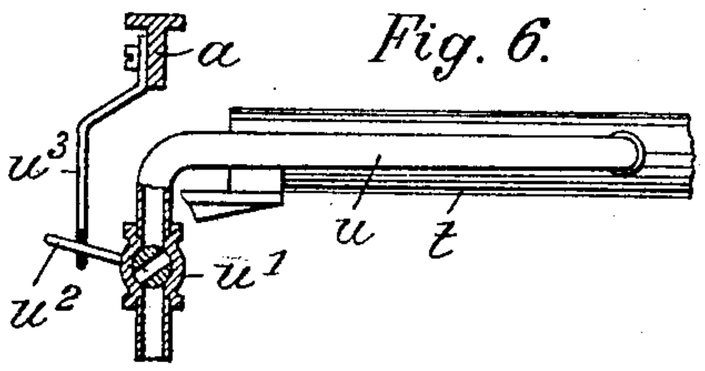


Fig. 7.

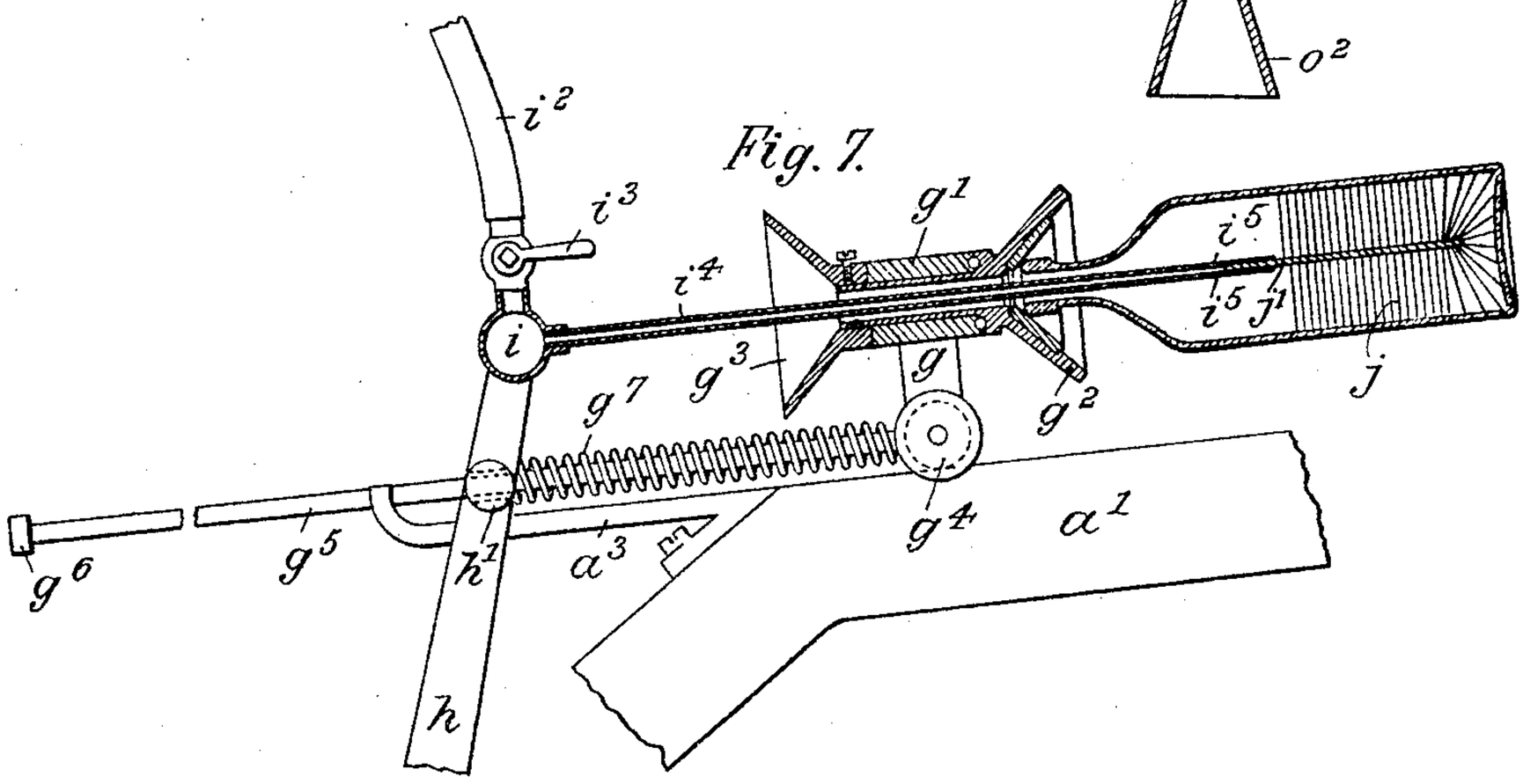
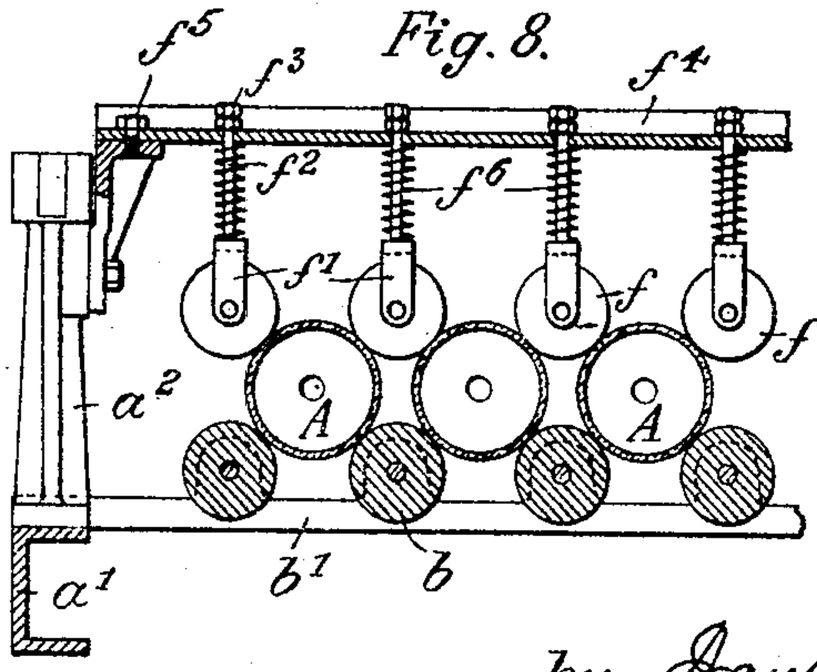


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN A. PRINCE, OF NEW YORK, N. Y.

BOTTLE-WASHING MACHINE.

No. 803,850. Specification of Letters Patent. Patented Nov. 7, 1905.

Application filed November 29, 1904. Serial No. 234,753.

To all whom it may concern:

Be it known that I, JOHN A. PRINCE, a citizen of the United States, residing at New York city, Manhattan, county and State of New York, have invented new and useful Improvements in Bottle-Washing Machines, of which the following is a specification.

This invention relates to a machine for scrubbing, washing, and rinsing bottles in a quick and effective manner, the bottles being delivered by the machine thoroughly cleaned and ready for refilling.

In the accompanying drawings, Figure 1 is a side elevation of my improved bottle-washing machine; Fig. 1ª, a detail of the clutch-operating means; Fig. 2, a plan of the machine; Fig. 3, a detail of the rinsing mechanism; Fig. 4, a cross-section on line 4 4, Fig. 3; Fig. 5, an enlarged detail of one of the rinsing-nozzles; Fig. 6, a detail of the water-inlet pipe and cock; Fig. 7, a detail of the carriage and its operating mechanism, and Fig. 8 a detail of the feed-rollers and pressure-rollers.

The letter a represents the frame of my improved bottle-washing machine. Across the inclined top a' of this frame extend a pair of bearings b', in which are journaled a series of spaced parallel feed-rollers b. These rollers are rotated simultaneously in the same direction from a power-shaft c by pulley c', belt c^2, pulley c^3, counter-shaft c^4, and beveled gear-wheels c^5 b^2. The bottles A to be washed are seated upon each pair of adjoining rollers and are by them simultaneously rotated in the same direction.

In order to feed the bottles along the rollers b, there is provided between each pair of such rollers an endless feed-chain d, the chains passing over sprocket-wheels d' d^2, mounted, respectively, on transverse shafts d^3 d^4. The shaft d^4 may be turned by a handle d^5, by means of which forward movement is imparted to the upper runs of the chains d. To each of the chains d are attached a pair of bottom brushes d^6, which are of a width to enter between the adjoining rollers b and push the bottles along the latter. To scrub the surface of the bottles, I provide an exterior cylindrical brush e, that is journaled to lie transversely of rollers b and may be rotated from shaft c by pulley e', belt e^2, and pulley e^4, the belt e^2 passing over idlers e^3.

The shaft e^5 of brush e is journaled in a pair of oscillating levers e^6, fulcrumed at e^7 to standards a^2 of frame a. To levers e^6 are pivoted at e^8 lifters e^9, having rollers e^{10}, that engage eccentrics d^7 of shaft d^4. By this construction the brush e is gradually raised after having scrubbed the bottle-neck to accommodate the bottle-body, while the bottle is simultaneously fed underneath brush e by the bottom brush d^6.

The bottles A are held to the feed-rollers b by pressure-rollers f, Fig. 8, of which one is arranged vertically above each of the rollers b. The rollers f are journaled in forks f', suspended by rods f^2 and nuts f^3 from a pair of fixed transverse rails f^4, extending across rollers b and bolted to brackets of standards a^2 at f^5. Springs f^6, encircling rods f^2, force rollers f against bottles A, so as to hold the latter in operative engagement with rollers b.

Back of brush e and rollers b there reciprocates a carriage or cross-head g in which are rotatably fitted a series of sleeves g', arranged in the paths of bottles A and having flaring ends g^2 g^3. The carriage g is provided with rollers g^4, traveling on rails a^3 of frame a, and with a pair of rods g^5, headed, as at g^6. The rods g^5 pass through perforated blocks h' of a pair of levers h, fast on rock-shaft h^2 and manipulated by handle h^3. Springs g^7 encircle rods g^5, between carriage g and levers h. At their upper ends the levers h form the bearings for the trunnions i' of a water-pipe i, which is thus carried along by the levers while free to rock in its bearings. The pipe i receives water through hose i^2, controlled by cock i^3, which is operated in suitable manner. To the pipe i are connected a series of nozzles i^4, adapted to be projected through sleeves g' and into bottles A and to discharge the water into the interior of the latter through lateral perforations i^5. To the end of each nozzle i^4 is fitted the stem j' of an interior brush j.

The inclined top a' of frame a slopes abruptly at its rear end to form a number of inclined runs k' between a series of inclined parallel rails k. By these runs the bottles are automatically conveyed to a feed mechanism that in turn carries them to rinsing-nozzles. These nozzles wash out the scrubbed bottle and complete the cleaning operation.

The feeding and rinsing mechanism, which is made the subject of a separate application for a patent, is constructed as follows: In the rear portion of frame a are journaled transverse shafts l m, carrying sprocket-wheels l' m'. These wheels are engaged by a pair of endless parallel roller feed-chains n, the up-

per runs of which travel on rail a^5, Fig. 3. The chains n are connected at suitable intervals by transverse perforated bars o, in which are fitted a series of nozzles o', having lower flaring ends o^2, Fig. 5. Each longitudinal row of nozzles is arranged in alinement with one of the runs k', so that a bottle descending along the run will be speared upon that one of the nozzles which has arrived opposite the bottom of the run.

Intermittent movement is imparted to shaft m, and consequently to feed-chains n, from counter-shaft p by crank p' and rod p^2, pivoted to lever p^3. This lever turns on shaft m and has a pawl p^4 engaging a ratchet-wheel m^2, fast on such shaft. Thus each revolution of shaft p will turn wheel m^2 for the length of one tooth and will correspondingly advance chain n and nozzles o'.

The movement of chains n is controlled by a treadle q, by the depression of which the counter-shaft p is operatively connected to a driving-shaft r, while the counter-shaft is automatically disconnected therefrom upon one complete rotation of the former. The means for effecting this result are as follows: Upon driving-shaft r turns loose driving-pulley r', that may be coupled thereto by clutch r^2. This clutch is operated by a bent shipping-lever q', fulcrumed at q^2 and connected by rod q^3 to treadle q, Fig. 1[a]. The shaft r is intergeared with arbor s by wheels r^3 s', while arbor s is operatively connected to shaft p by chain s^3, passing over wheels s^2 p^5 of like size. On arbor s is mounted a disk s^4, having nose s^5, adapted to engage a collar r^4 of clutch r^2. When the treadle q is depressed, the shipping-lever q' will move clutch r^2 to the right, and thereby couple pulley r' to shaft r. In this way motion will be transmitted from shaft r through wheels r^3 s', arbor s, and chain s^3 to shaft p. On each complete rotation of shaft s, and consequently of shaft p, the nose s^5 will open clutch r^2 to arrest shaft r, and thereby stop shaft p.

The flaring lower ends o^2 of nozzles o' are adapted to receive tapering nipples t', projecting upwardly from a pair of transverse water-supply pipes t. These pipes are vertically movable so that when raised their nipples will project into two transverse rows of nozzles, while when the pipes are lowered their nipples will clear the nozzles and permit the chains to be moved. To alternately raise and lower the pipes t, there are mounted upon shaft p a pair of cams p^6, engaged by rollers t^2, journaled in the lower forked ends t^3 of lifters t^4. These lifters are vertically movable in bearings t^5 and carry brackets t^6, to which the pipes t are attached. Thus it will be seen that each rotation of shaft p will cause a complete reciprocating movement of pipes t.

The pipes t communicate with each other by branches t^7, and one of the former receives rinsing-water by inlet-pipe u, which rises and falls with pipes t. The cock u' of pipe u is automatically opened when pipes t are raised and closed when the pipes are lowered. To produce this result, a handle u^2 of cock u' passes through an eye in the lower end of a fixed arm u^3, depending from frame a. When the pipe t, and consequently the pipe u, is raised, the engagement of handle u^2 with arm u^3 will open cock u', while upon a descent of the pipes the cock will be closed.

The machine is so adjusted that when at rest a transverse row of nozzles o' stops directly beneath the row of runs k'. The bottles are delivered upon the rollers b, preferably from a soaking-tank, and are by them axially rotated. The handle d^5 is turned to advance bottom brushes d^6 and cause them to push the bottles down along the rollers until they arrive beneath the rotating exterior brush e. After the necks of the bottles have been scrubbed the brush e is raised by cam d^7 to accommodate the body of the bottle, which is carried into the position shown in Fig. 1. The levers h are swung forward by handle h^3 to advance carriage g by springs g^7 and cause the flaring ends g^2 of sleeves g' to receive the heads of the bottles. The further forward movement of levers h carries the nozzles i^4 and brushes j through the sleeves g' into the interior of the bottles, after which the cock i^3 is opened and handle h^3 oscillated a few times to reciprocate the brushes j within the bottle, and thus wash and scrub their interior. During this manipulation the sleeves g' are held against the bottles by the springs g^7. When the interior washing and scrubbing is finished, the levers h are swung into their extreme backward position. During the first portion of this movement the nozzles i^4 and brushes j are withdrawn from the bottles, while the sleeves g' remain in contact with the same. As soon as levers h strike heads g^6 of rods g^5 the sleeves, as well as the brushes, are moved backward and are withdrawn from the paths of the bottles. The handle d^5 is now again manipulated to push the bottles along rollers b by brushes d^6, so that the exterior surfaces and the bottoms of the bottles are scrubbed by brushes e and d^6. When the bottles arrive at runs k', they will tilt and slide down along the runs to be speared by a transverse row of nozzles o'. By depressing treadle q the feed-chains n are advanced for a distance equal to the distance between a pair of adjoining bars o. After this advance has taken place the chains will be automatically arrested by the operation of the clutch-opening nose s^5. Thus the successive depressions of treadle q will intermittently advance the bottles impailed upon nozzles o'. Each operation of treadle q will also by cam p^6 elevate pipes t and raise their nipples t^2 into engagement with the flaring ends o^2 of those two rows of nozzles o' which are in vertical alinement with the

nipples. The raising of pipes t will simultaneously open cock u' by arm u^3 and handle u^2. In this way jets of rinsing-water are squirted into the bottles to finish the washing operation. The clean bottles are carried by nozzles o' over a conveyer v, upon which they drop, Fig. 1, and which transports them to the bottling department or other destination desired.

What I claim is—

1. A bottle-washing machine provided with rotatable feed-rollers, means for moving a bottle along the same, a fixed rail extending across the rollers, spring-influenced pressure-rollers suspended from the rail in vertical alinement with the feed-rollers, and a brush journaled to lie transversely of the feed-rollers, substantially as specified.

2. A bottle-washing machine provided with a carriage, rods secured thereto, levers engaging the rods, a sleeve rotatably supported by the carriage, a pipe connected to the levers, a nozzle on the pipe, and a brush on the nozzle that passes into the sleeve, substantially as specified.

3. A bottle-washing machine provided with a carriage, headed rods secured thereto, perforated levers engaging the rods, springs mounted on the rods between carriage and levers, a sleeve supported by the carriage, a pipe connected to the levers, a nozzle on the pipe, and a brush on the nozzle that passes into the sleeve, substantially as specified.

Signed by me at New York city, (Manhattan,) New York, this 28th day of November, 1904.

JOHN A. PRINCE.

Witnesses:

WILLIAM SCHULZ,

FRANK V. BRIESEN.