No. 776,547. PATENTED DEC. 6, 1904.

J. A. PRINCE.

BOTTLE WASHING MACHINE.

APPLICATION FILED FEB. 8, 1904.

NO MODEL. 3 SHEETS—SHEET 1.

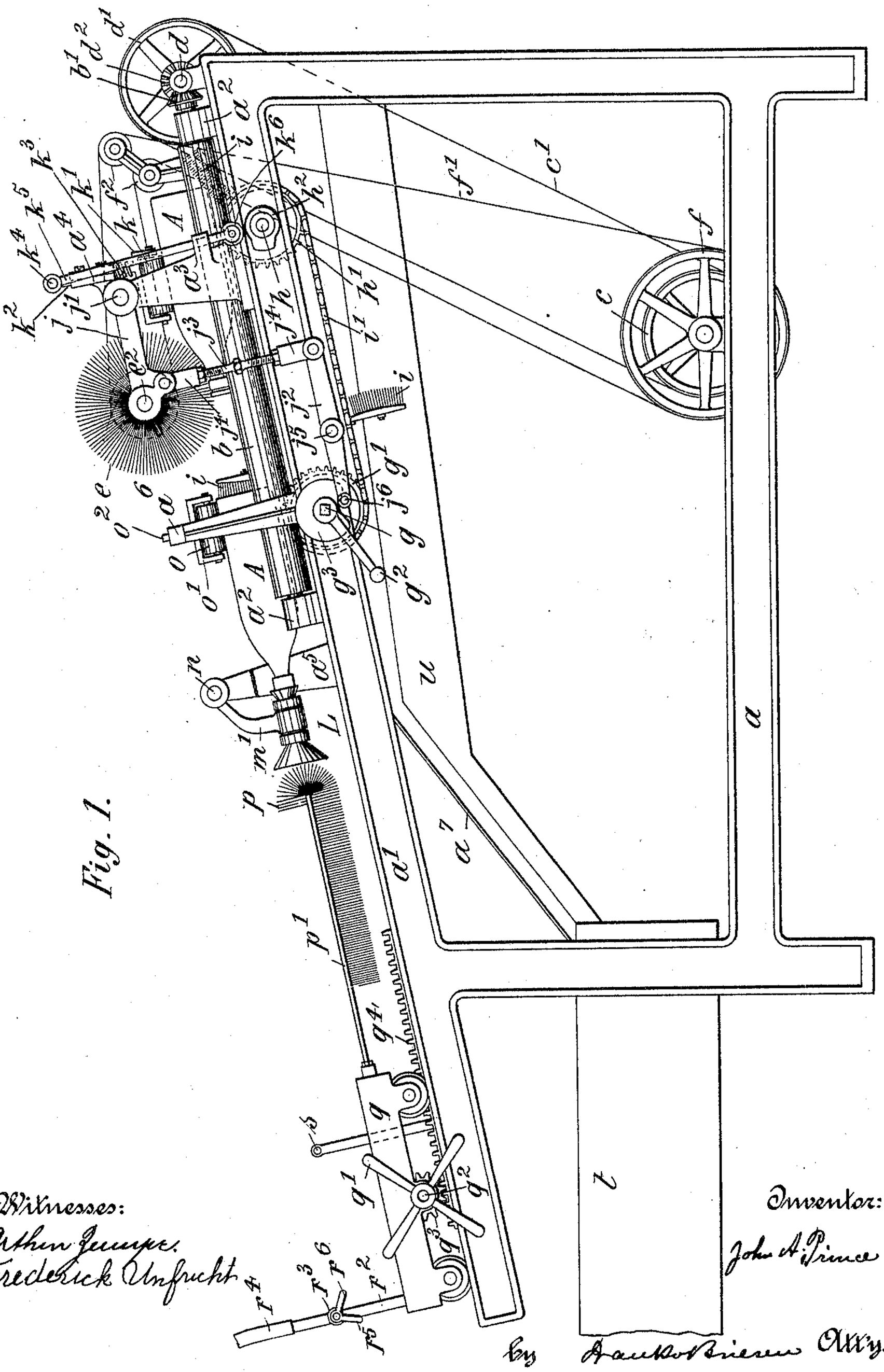

Fig. 1.

Witnesses:
Arthur Jennpe.
Frederick Unfricht

Inventor:
John A. Prince
By Church & Brieson Att'y.

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NO MODEL. 3 SHEETS—SHEET 2.

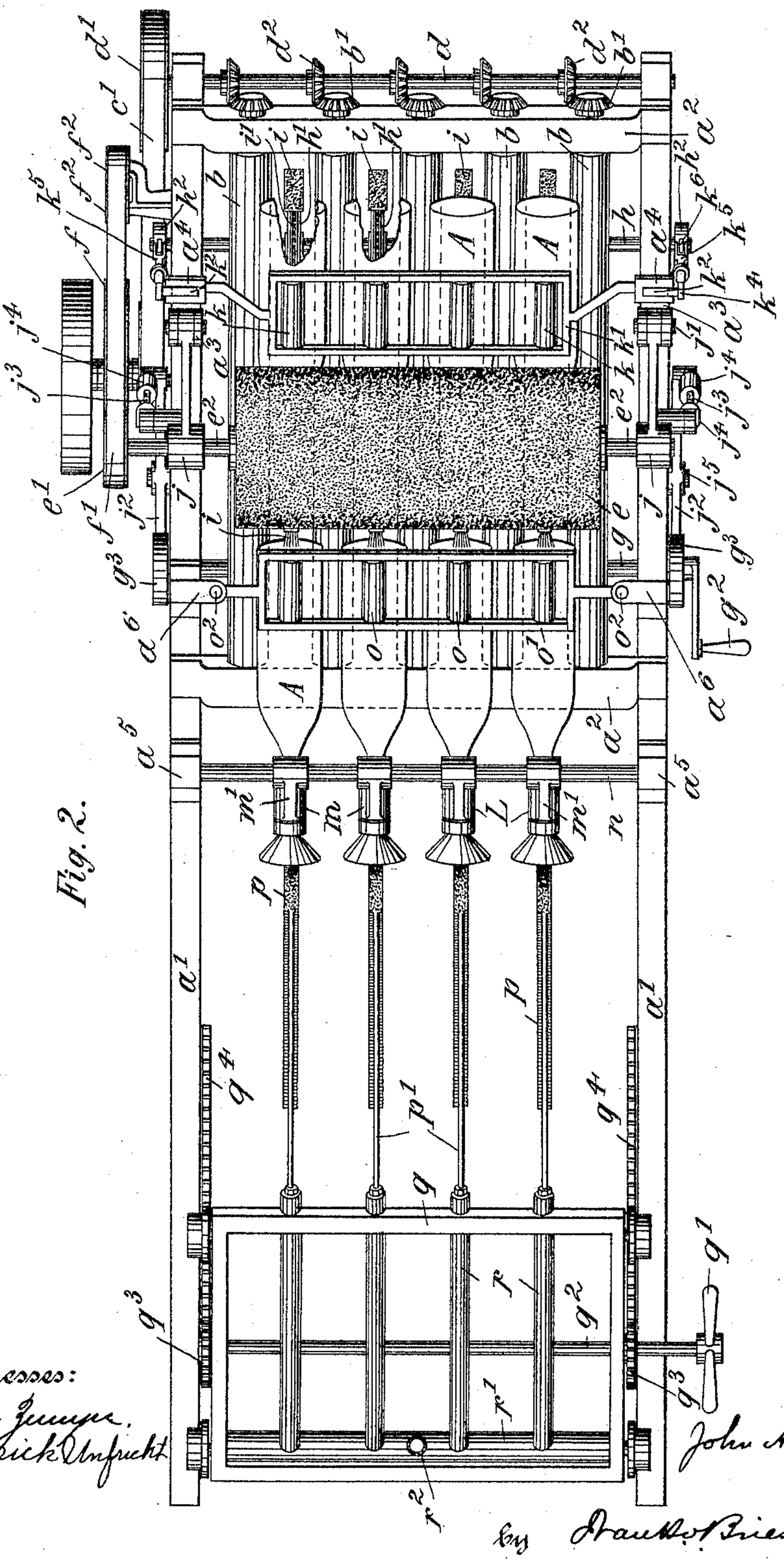

Fig. 2.

Witnesses:
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NO MODEL. 3 SHEETS—SHEET 3.

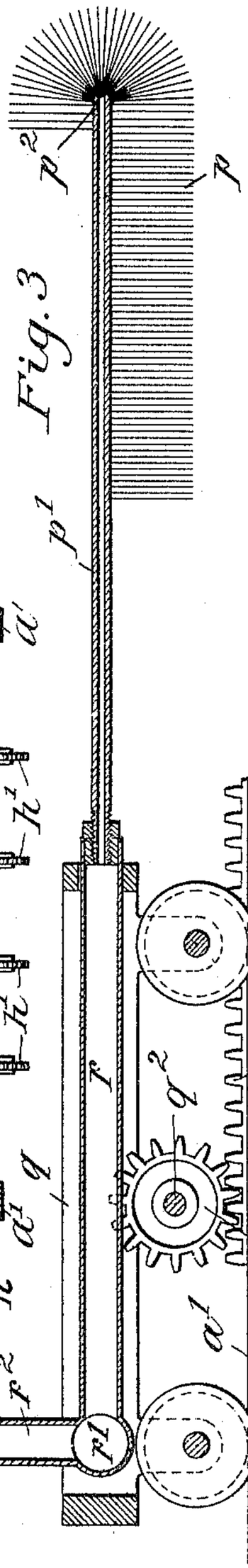

Fig. 3.

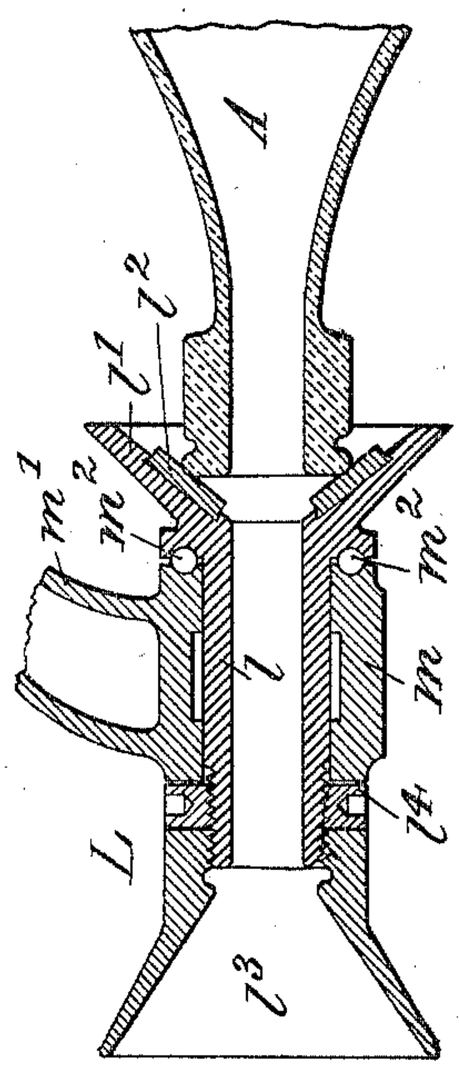

Fig. 4.

Witnesses:
Arthur Jacobs.
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Inventor:
John A. Prince
by Paul Bakewell Atty.

PHOTO-LITHOGRAPHED BY SACKETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

No. 776,547. Patented December 6, 1904.

UNITED STATES PATENT OFFICE.

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

BOTTLE-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 776,547, dated December 6, 1904.

Application filed February 8, 1904. Serial No. 192,532. (No model.)

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 by which bottles may be thoroughly cleaned from the interior and exterior in a quick, simple, and efficient manner.

In the accompanying drawings, Figure 1 is a side elevation of my improved bottle-washing machine; Fig. 2, a plan thereof with some of the parts omitted; Fig. 3, a detail longitudinal section through the carriage; Fig. 4, a similar section through the nozzle, and Fig. 5 a detail of the vertically-movable frame.

The letter *a* represents the frame of my improved bottle-washing machine, which has preferably an inclined top *a'*, as shown. Across this top extends a pair of transverse bearings a^2, in which are journaled a series of spaced parallel feed-rollers *b*, which are inclined to correspond to the pitch of top *a'*. The feed-rollers are rotated in the same direction by suitable means. The drawings show the driving-wheel *c* to be connected by a belt *c'* with a pulley *d'* of a counter-shaft *d*, which is intergeared with rollers *b* by bevel-wheels d^2 *b'*. The rollers *b* are so spaced as to form intervening seats for the bottles A to be washed. As the bottles are placed upon the rollers *b* they will be rotated and will simultaneously descend by gravity until arrested by an exterior cylindrical brush *e*, which extends across rollers *b*. The brush *e* is designed to clean the outside of the rotating bottles and is operated from a pulley *f* by belt *f'*, passing over idlers f^2 and engaging pulley *e'*, fast on shaft e^2 of brush *e*.

In order to feed the bottles under the rotating brush *e*, so that they are subjected to the action of the same from end to end, I have devised the following mechanism: Across the frame *a* and at opposite sides of brush *e* are journaled a pair of shafts *g h*, each carrying a sprocket-wheel *g' h'* between each pair of rollers *b*. The wheels *g' h'* are engaged by the endless chains *i'*, to each of which are connected a number of bottom brushes *i*. These brushes are adapted to be projected between rollers *b* and to engage the bottoms of the rotating bottles A, so as to clean such bottoms and to simultaneously push the bottles forward. Intermittent motion may be imparted to the chains *i'* by means of a handle g^2 of shaft *g*. As the neck of a bottle is of less diameter than its body, it is necessary to raise the brush *e* while the bottles are being pushed forward underneath the same. To obtain this result, the shaft e^2 of brush *e* is journaled in swinging bearings *j*, fulcrumed at *j'* to standards a^3 of frame *a*. The bearings *j* are adjustably connected to a cam-lever j^2 by right-and-left screw j^3 and pivoted sockets j^4, so as to compensate for wear. The lever j^2 is fulcrumed at j^5 and has cam-roller j^6 engaging cam g^3, fast on *g*. Thus after the brush *e* has scrubbed the bottle-neck it will be gradually raised to accommodate the bottle-body while the bottle is simultaneously fed under the brush *e* by the brush *i*. In order to insure a positive rotation of the bottles, they are engaged by pressure-rollers *k*, arranged above the chains *i'*, and consequently above the paths of bottles A. These rollers are journaled in a vertically-movable frame *k'*, having upright arms k^2, which are slidable in grooved guides a^4 of standards a^3. The arms k^2 are influenced by springs k^3 and are pivoted at k^4 to lifters k^5, having rollers k^6, which engage cams h^2 of shaft *h*. By the construction described the rollers *k* will be alternately raised and lowered to first permit the introduction of the bottles and to then hold the bottles down as they are fed along rollers *b* by brushes *i*. The rotation of handle g^2 is continued until the bottles have cleared the brush *e* and have been pushed by the brushes *i* against rotatable nozzles L. These nozzles are arranged in the paths of the bottles A in advance of the rollers *b* and are journaled in tubular bearings *m* of arms or brackets *m'*. The arms *m'* are fast on a transverse rock-shaft *n*, journaled in standards a^5 of frame *a* and extending across the frame. Each nozzle L is composed of a tubular body *l*, Fig. 4, having a flaring rear socket *l'*. This socket

is provided with a yielding lining l^2, with which the head of the bottle A is adapted to contact. At its forward end the tube l carries a flaring mouthpiece l^3, engaged by a jam-nut l^4. In order to insure the rotation of nozzles L by the bottles A, antifriction-balls m^2 are interposed between socket l' and bearing m. While the bottles A bear against the lining l^2 of sockets l' they are held down by pressure-rollers o. These rollers are journaled in a frame o', having uprights o^2, which are guided in hollow standards a^6 of frame a, the rollers operating, preferably, by gravity.

In order to clean the interior of the bottles A, I provide reciprocating brushes p, Fig. 3, which are adapted to be projected through the nozzles L while the bottles are held against the latter. The brushes p are mounted upon pipes p', having openings p^2 at their free end. The pipes p are connected to a carriage q, which is movable along the inclined top a' of frame a. The carriage is shown to be operated by a hand-wheel q' on axle q^2, such axle also carrying a pair of pinions q^3, engaging fixed racks q^4 of frame a. By manipulating the hand-wheel the carriage may be readily reciprocated, so as to introduce the brush p through nozzle L into the bottle A and to withdraw it therefrom. The tubes p' are supplied with rinsing-water by a series of water-pipes r, mounted on carriage q and communicating with a common supply-pipe r'. The pipe r' is connected by pipe r^2, having cock r^3, and by flexible connection r^4 to a water-service pipe. (Not shown.) The cock r^3 is adapted to be automatically operated in suitable manner, so as to open when the carriage is advanced and to close when the carriage is retracted. To this effect an elbow-lever r^5 r^6 is mounted upon the cock-spindle and is adapted to engage a fixed stop s, projecting across its path. When the carriage advances, the stop engages the arm r^5 to open the cock, and when the carriage retracts the cock is closed by the engagement of the stop with the arm r^6. After the bottles A have been pushed against the nozzles L the carriage q is advanced by turning hand-wheel q', and in this way the brush p is thrust through nozzle L into the interior of the bottle. At the same time the water is automatically turned on, and as the bottle continues to rotate its interior will be thoroughly cleaned. When the operation is completed, the carriage is retracted to withdraw the brushes and turn off the water. The brackets m' are then swung upward, so that the nozzles L clear and liberate the bottles A, after which the handle g^2 is again turned to impart motion to chains i'. The forward brush i will thus force the forward botttle A off rollers b and toward an inclined run a^7, that conveys it to a suitable tank t. The rearmost brush i will at the same time engage the rearmost bottle and push it underneath the exterior brush e. During the last period of the rotation of handle g^2 the pressure-rollers k are raised to admit a new set of bottles upon the rollers b.

The machine should be supplied with the bottles while the latter are in a wet state, the bottles being delivered preferably from a soaking-tank. In order to catch the drippings, a pan u is secured to frame a beneath rollers b.

It is obvious that the number of feed-rollers b may be varied, so as to vary the capacity of the machine.

It will be seen that by my machine all labels, adhesives, and sediments are effectively removed from the bottles in a quick, reliable, and simple manner.

What I claim is—

1. A bottle-washing machine provided with rotatable feed-rollers, means for moving a bottle along said rollers, and a brush journaled to lie transversely of the rollers, substantially as specified.

2. A bottle-washing machine provided with rotatable feed-rollers, means for moving a bottle along said rollers, a brush journaled to lie transversely of the rollers, and means for raising and lowering said brush, substantially as specified.

3. A bottle-washing machine provided with rotatable feed-rollers, an endless chain, a bottom brush on the chain which is adapted to be projected between the rollers, and an exterior brush journaled to lie transversely of the rollers, substantially as specified.

4. A bottle-washing machine, provided with spaced rotatable feed-rollers, an endless chain, a bottom brush secured thereto and adapted to be projected between the rollers, an exterior brush hung across the rollers, and means for raising and lowering said brush, substantially as specified.

5. A bottle-washing machine, provided with spaced rotatable feed-rollers, an endless chain, a bottom brush secured thereto, a rotatable exterior brush above the feed-rollers, and a pressure-roller above the chain, substantially as specified.

6. A bottle-washing machine, provided with rotatable feed-rollers, an endless chain, a bottom brush on the chain, an exterior brush extending across the rollers, means for raising and lowering the exterior brush, and means for simultaneously operating the endless chain, substantially as specified.

7. A bottle-washing machine provided with rotatable feed-rollers, means for moving a bottle along said rollers, a pivoted bearing, an exterior rotatable brush journaled therein transversely to the feed-rollers, a cam-lever, and means for adjustably securing said lever to the bearing, substantially as specified.

8. A bottle-washing machine provided with rotatable feed-rollers, means for moving a bot-

tle along said rollers, a brush journaled to lie transversely of the rollers, and a rotatable nozzle arranged in the path of the bottle between said rollers, substantially as specified.

9. A bottle-washing machine provided with rotatable feed-rollers, means for moving a bottle along said rollers, a brush journaled to lie transversely of the rollers, a transversely-extending shaft, a swinging bearing secured to the shaft, and a rotatable nozzle journaled in the bearing, substantially as specified.

10. A bottle-washing machine provided with rotatable feed-rollers, means for moving a bottle along said rollers, a brush journaled to lie transversely of the rollers, a transversely-extending shaft, a swinging bearing secured to said shaft, and a rotatable nozzle having a flaring mouthpiece and journaled in said bearing, substantially as specified.

11. A bottle-washing machine provided with rotatable feed-rollers, means for moving a bottle along said rollers, a movable nozzle in the path of the bottle between the rollers, a reciprocating carriage, and an interior brush mounted on said carriage and adapted to be projected into the nozzle, substantially as specified.

12. A bottle-washing machine provided with rotatable feed-rollers, means for moving a bottle along said rollers, a movable nozzle in the path of the bottle between the rollers, a rack, a carriage, a pinion on the carriage engaging the rack, and an interior brush mounted on the carriage and adapted to be projected into the nozzle, substantially as specified.

13. A bottle-washing machine provided with rotatable feed-rollers, means for moving a bottle along said rollers, an exterior brush journaled to lie transversely of the rollers, a movable nozzle in the path of the bottle between the rollers, a reciprocating carriage, and an interior brush on the carriage which is adapted to be projected into the nozzle, substantially as specified.

14. A bottle-washing machine provided with rotatable feed-rollers, means for moving a bottle along said rollers, a vertically-movable pressure-roller above the feed-rollers, and a brush journaled to lie transversely of the feed-rollers, substantially as specified.

15. A bottle-washing machine provided with rotatable feed-rollers, means for moving a bottle along said rollers, pressure-rollers above the feed-rollers, a movable frame carrying the pressure-rollers, means for guiding said frame, and a brush journaled to lie transversely of the feed-rollers, substantially as specified.

Signed by me at New York city, (Manhattan,) New York, this 6th day of February, 1904.

JOHN A. PRINCE.

Witnesses:
WILLIAM SCHULZ,
FRANK V. BRIESEN.