

No. 693,589.

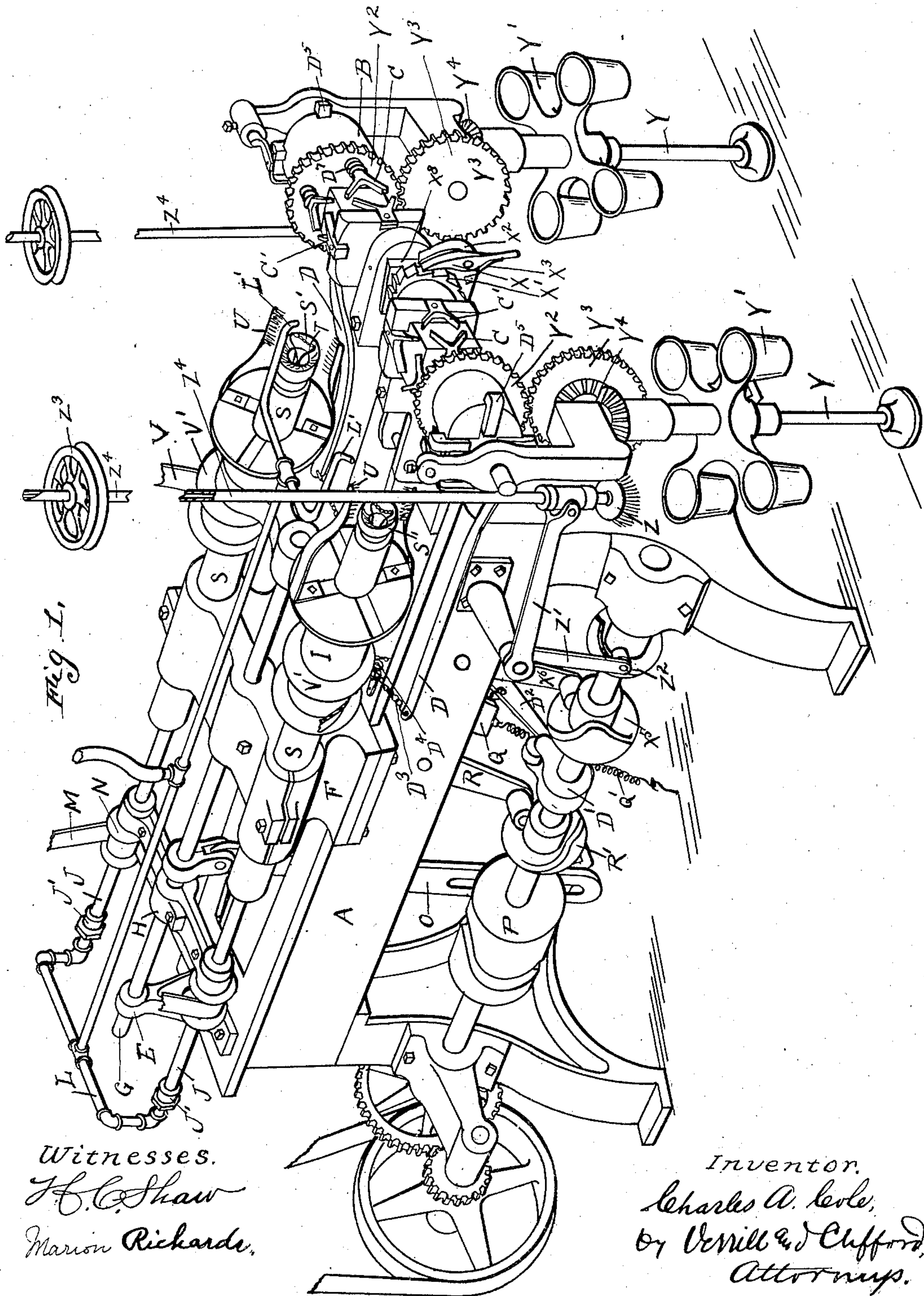
Patented Feb. 18, 1902.

C. A. COLE.  
BOTTLE WASHING MACHINE.

(Application filed June 13, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses.  
H.C. Shaw  
Marion Richards.

Inventor.  
Charles A. Cole,  
by Verrill & Clifford,  
Attorneys.

No. 693,589.

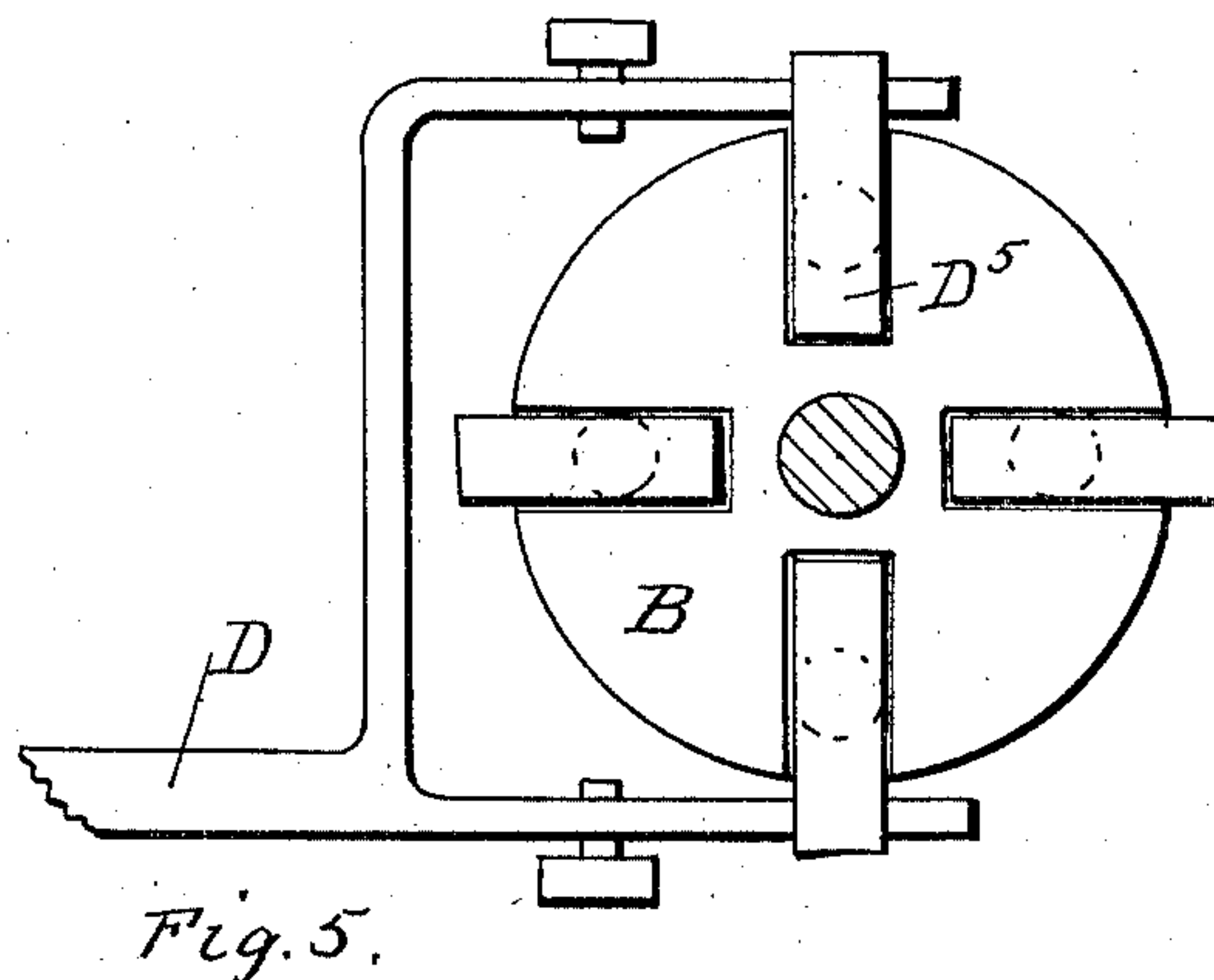
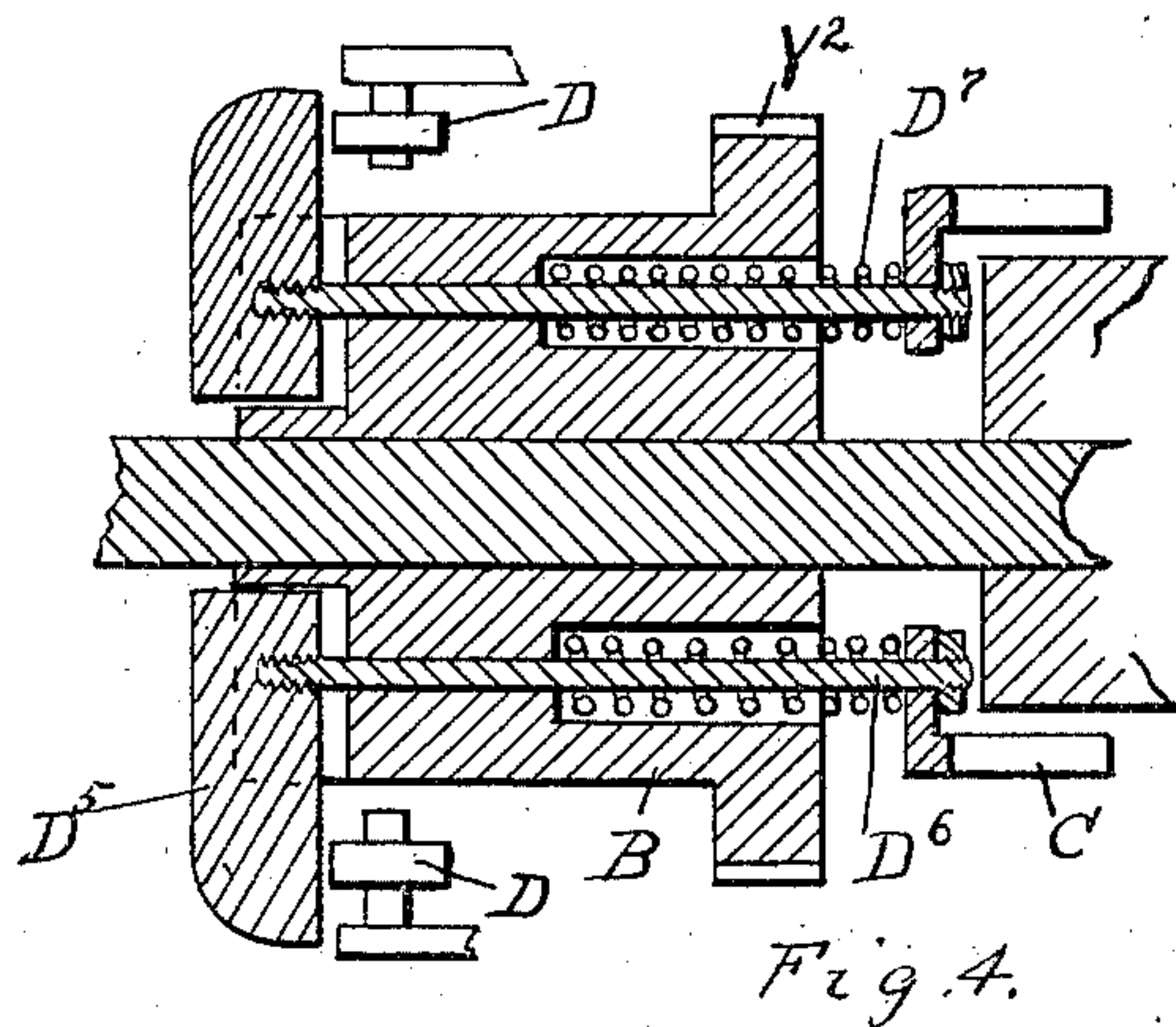
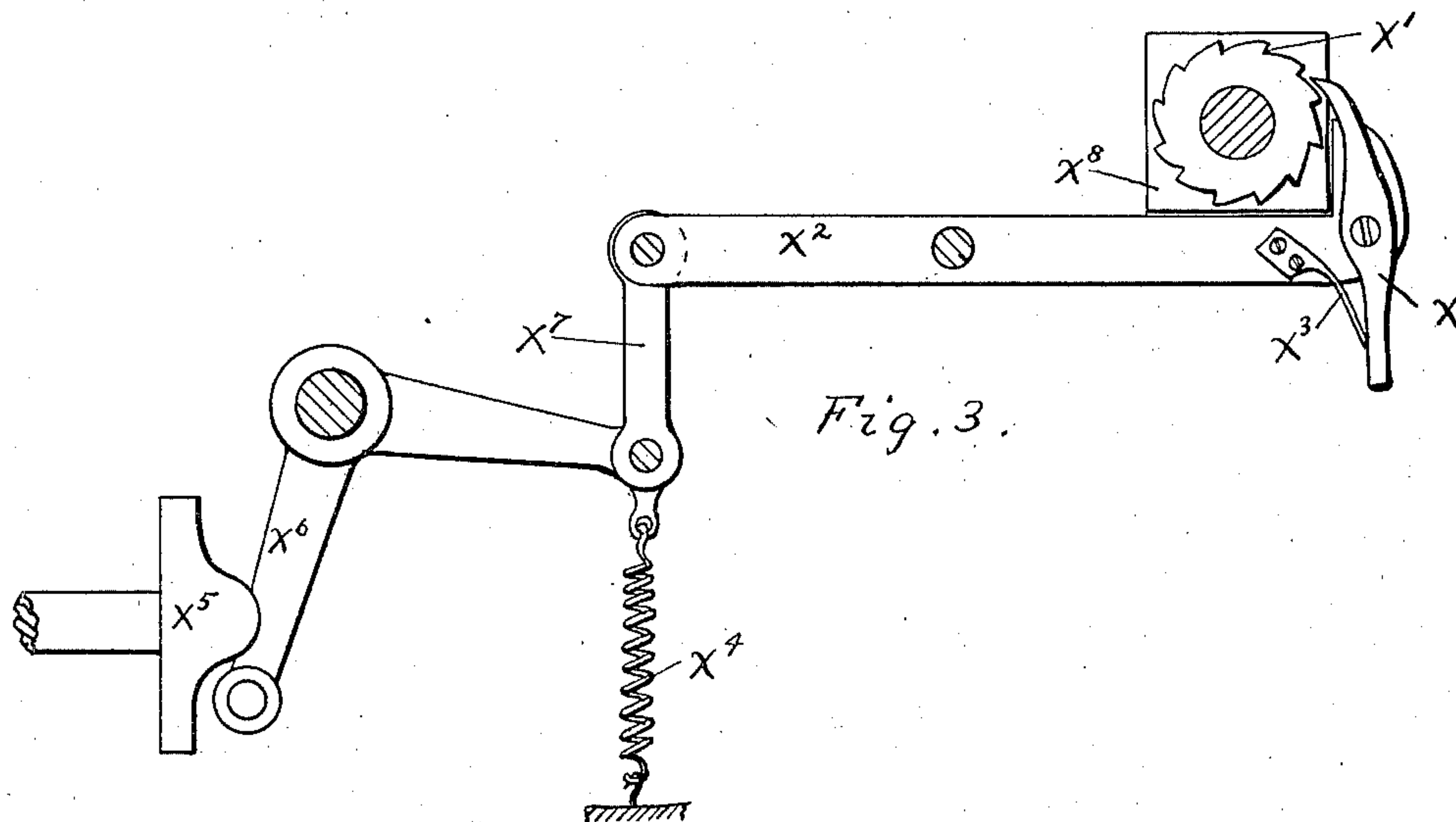
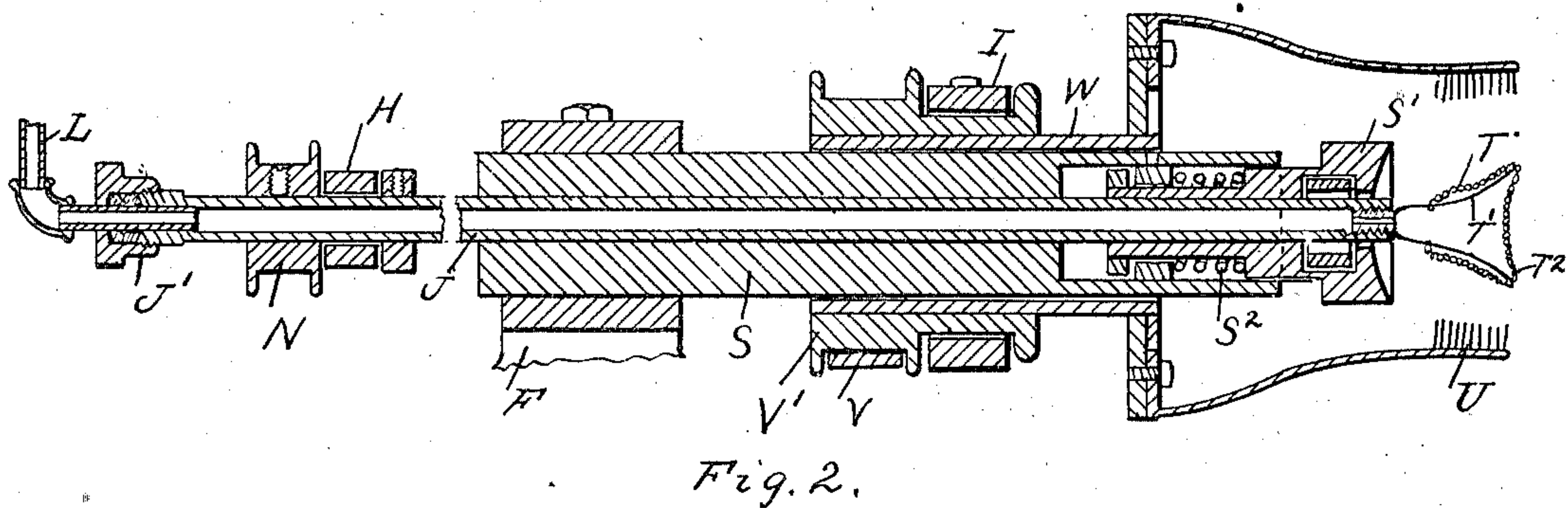
Patented Feb. 18, 1902.

C. A. COLE.  
BOTTLE WASHING MACHINE.

(Application filed June 13, 1901.)

(No Model.)

3 Sheets—Sheet 2.



Witnesses,  
H. C. Shaw  
Marion Richards.

Inventor,  
Charles A. Cole,  
by Verrill & Clifford,  
Attorneys.



No. 693,589.

Patented Feb. 18, 1902.

C. A. COLE.  
BOTTLE WASHING MACHINE.

(Application filed June 13, 1901.)

(No Model.)

3 Sheets—Sheet 3.

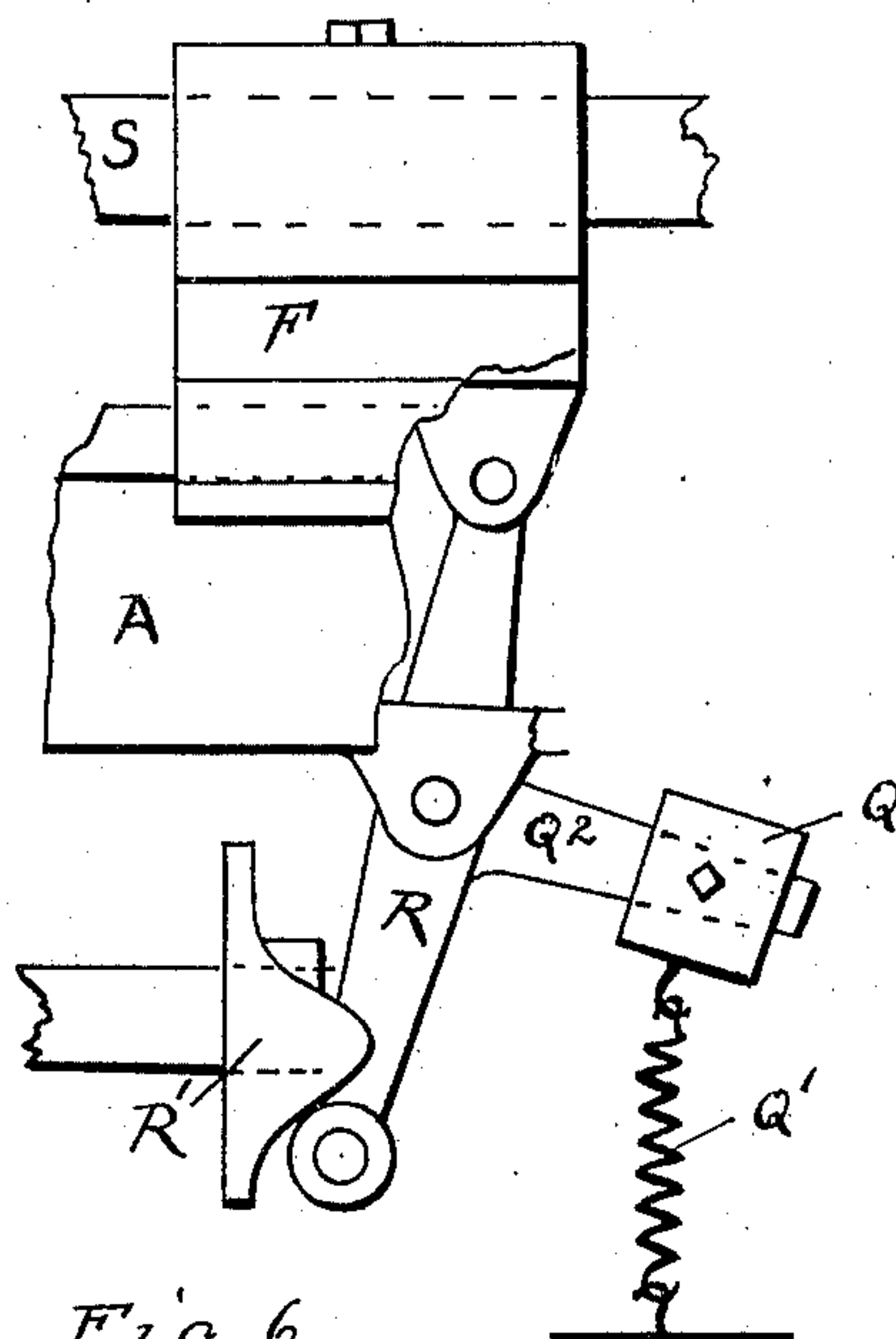


Fig. 6.

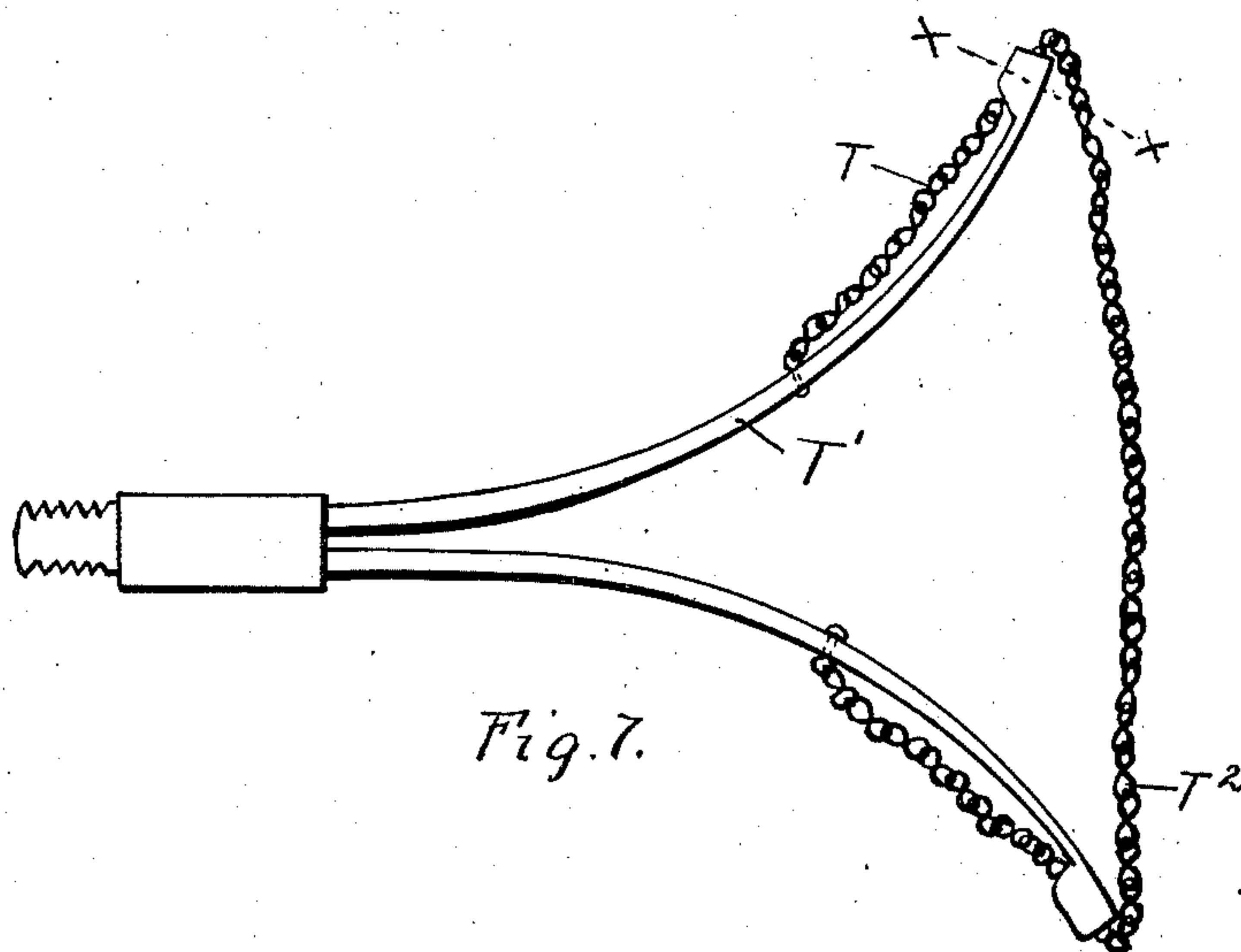


Fig. 7.

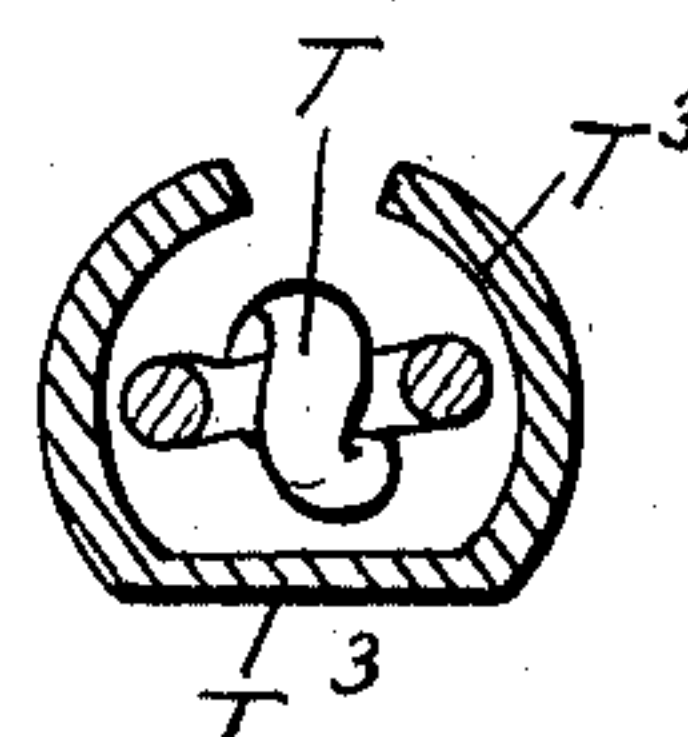


Fig. 8.

Witnesses.  
*H. C. Shaw*  
Marion Richards.

Inventor.  
*Charles A. Cole,*  
by *Verrill and Clifford,*  
Attorneys.

# UNITED STATES PATENT OFFICE.

CHARLES A. COLE, OF POLAND, MAINE.

## BOTTLE-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 693,589, dated February 13, 1902.

Application filed June 13, 1901. Serial No. 64,352. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES A. COLE, a citizen of the United States, residing at Poland, in the county of Androscoggin and State of Maine, have invented certain new and useful Improvements in Bottle-Washing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in machines for washing bottles and is designed to operate automatically, the bottles being placed upon a revolving drum and being presented while held on said drum to the washing apparatus, which has a rotary and reciprocating motion relative to said drum. It is also designed when desired to wash the outside of the bottle, except the bottom, simultaneously with the inside. It is also designed, when desired, to wash the outside bottom of the bottle after the walls and inside bottom have been washed.

It also relates to certain details of construction involving mechanism and combinations of mechanism incidental to the main apparatus of my invention, all of which will be hereinafter more fully described, reference being had to the drawings herewith accompanying and making a part of this application.

The apparatus may be adapted to wash a single bottle or the parts may be duplicated, so as to wash a plurality of bottles simultaneously, that shown being adapted to wash two bottles at a time.

It will be evident that the cams, levers, and other means employed to actuate the several parts may be varied greatly or equivalent means employed, and I do not limit myself in these respects otherwise than as set out in the formal claims.

In said drawings, Figure 1 is a perspective view of my improved machine. Fig. 2 is a detail longitudinal central sectional view of the rotary reciprocating scrubber and its operating mechanism. Fig. 3 is a detail view of the drum-operating mechanism. Fig. 4 is a vertical central sectional view of a portion of the drum, showing means for operating the

jaws. Fig. 5 is an end view of the drum, showing lever for operating the jaws. Fig. 6 is a detail view of mechanism for operating the reciprocating carriage. Fig. 7 is a side elevation of my improved scrubbing device. Fig. 8 is a transverse sectional view taken on line X X, Fig. 7.

Same letters refer to like parts in the several figures.

In the drawings, A represents a suitable frame adapted to support my washing mechanism. Mounted transversely of said frame at one end is a revolving drum B, having sets of two clamping-jaws C and C', spaced apart circumferentially upon said drum, one jaw C of each set being movable relative to the other, the movable jaws of the set diametrically opposite each other being adapted to be operated simultaneously and to be opened by means of lever D, actuated by a cam D' through an intermediate lever D<sup>2</sup>, pivoted to the frame, and a flexible chain D<sup>3</sup>, which may, if desired, pass over an anti-friction-roll D<sup>4</sup> upon the main frame. The end of the lever strikes against blocks D<sup>5</sup>, to which the movable jaws are attached by means of rods D<sup>6</sup>. The jaws are held normally closed by coil-springs D<sup>7</sup>. The drum has an intermittent rotary motion imparted to it by means of a pawl X engaging a ratchet X', secured to the shaft of the drum. As shown, the pawl is pivotally mounted on the end of a lever X<sup>2</sup>, pivoted to the frame, and is held in engagement with the ratchet by means of spring X<sup>3</sup>. The opposite end of the lever X<sup>2</sup> is actuated by a spring X<sup>4</sup>, which constantly tends to throw the pawl end of the lever up. The return movement of the pawl is effected by means of a cam X<sup>5</sup> on the main shaft, which engages one end of a crank-lever X<sup>6</sup>, the other end being connected with the end of the pawl-operating lever by a link X<sup>7</sup>. Both movements of the pawl actuating the lever may be accomplished by a cam movement, if desired. The upward throw of the pawl-actuating lever is limited by the lever coming in contact with a block X<sup>8</sup> on the shaft of the drum.

In adapting my improved apparatus to wash two bottles at a time I erect at one end of the machine a stationary bracket E, and be-



tween bracket E and the revolving drum I locate a reciprocating carriage F and mount in said bracket and carriage a reciprocating rod G. Supported on said rod are yokes H and I, adapted to reciprocate therewith. Passing through the ends of said yokes and carriage and rigidly secured to the yokes are water-pipes J. The pipes aforesaid have a stuffing-box connection J' with a water-supply pipe L and are rotated by means of a belt M, passing over pulleys N, secured to said pipe. The supporting-rod G, the supporting-yokes H and I, and the water-pipe J are given a long reciprocation by means of lever O, operated by a cam P on the main shaft. The carriage F has a reciprocating movement independent of the water-pipe, the forward motion being given by means of a weight Q and spring Q', one or both, attached to the arm Q<sup>2</sup> of a T-lever R, pivotally mounted in the frame and pivotally secured to the carriage at one end, the other end being operated by a cam R' to return the carriage. Concentric with the water-pipe is a sleeve S, having at its end a receiver S' to engage the mouth of a bottle. In order that the receiver may have a yielding contact with the bottle to accommodate it to bottles of slightly-varying length, I interpose a spring S<sup>2</sup> between the receiver and the sleeve. This sleeve S is reciprocated by the carriage, and the receiver is located relative to the scrubber T, secured to the end of the water-pipe, so that the reciprocation of the pipe draws the scrubber into the sleeve, compressing the yielding spring-arms T' of the scrubber, so that they may readily enter the bottle as the pipe moves forward. It will be evident that the arms will tend to separate as the scrubber enters the bottle, bringing the scrubbing-surfaces T uniformly in contact with the walls of the bottle, the transverse section T<sup>2</sup> finally scrubbing the bottom of the bottle, the pipe J projecting a spray of water into the bottle at the same time.

Concentric with the water-pipe and sleeve S is a second sleeve W, passing loosely through the yoke I, adapted to be reciprocated by said yoke. The sleeve has on its forward end one or more scrubbing-brushes U, positioned relative to the receiver so that said brushes rotate against the outside wall of the bottle. It will be seen that the brushes U and scrubber T being both reciprocated by the rod G traverse the walls of the bottle at the same time. The sleeve W is rotated by means of a belt V, passing over a pulley V' on the sleeve. A section L' of the water-pipe terminates adjacent the brushes and, reciprocating therewith, projects a spray of water upon the outside of the bottle contiguous to the brushes.

To provide for the washing of the outside bottoms of the bottles, I place under the drum a rotary post Y, carrying a series of bottle-holding cups Y', arranged circumferentially

around said post, the post and cups being adapted to be rotated by the drum through a gear Y<sup>2</sup> on the shaft of the drum, intermediate gear Y<sup>3</sup>, and bevel-gears Y<sup>4</sup>. Each quarter-rotation of the drum thus brings one of the cups directly under the jaws on the under side of the drum and when the bottle is discharged it falls into the cup bottom up. A brush Z has a vertically-reciprocating motion imparted to it by means of a lever Z', actuated by a cam Z<sup>2</sup> on the main shaft. This brush is given a rotary motion by means of a pulley Z<sup>3</sup>, secured to the shaft Z<sup>4</sup>, on which the brush is set. The cups are spaced apart, so that while one presents a bottle to be washed another is ready to receive a bottle from the jaws.

The scrubber which I find most effective and durable consists of a metal chain, the ends attached to the spring-arms midway their length and passing loosely over the ends through a tubular section T<sup>3</sup> of the spring-arms.

The several parts of the machine are adjusted and timed so that an operator can place the bottles in the clamping-jaws and remove them from the cups into which they are discharged from said jaws, the operation of washing as to all parts, including the proper positioning of the bottle, being entirely automatic.

The operation of my bottle-washing machine is as follows: The bottles are placed bottom down upon the drum between the clamping-jaws. The drum is then rotated a quarter-turn, which brings the bottles thus placed into a horizontal position and in the path of the outside and inside washing mechanism. The bottles rest here until the reciprocation of the inside and outside washing mechanism. The drum then rotates another quarter-turn and the clamping-jaws automatically release the bottles, which fall by gravity into the rotary cups bottom up, when the bottom-washing mechanism descends upon the bottoms of the bottles and completes the washing. The operation will be continuous as long as bottles are fed at each quarter-rotation into the clamping-jaws on the top of the drum.

Having thus described my invention and its use, I claim—

1. In a bottle-washing machine, a rotating drum, means for holding bottles on the periphery thereof extending in a radial direction, means for automatically and periodically releasing said bottles, and a scrubber adapted to have a reciprocating motion and positioned to enter and withdraw from a bottle on the drum at each reciprocation.

2. In a bottle-washing machine, a rotary drum, means for holding bottles on the periphery thereof extending in a radial direction, means for automatically and periodically releasing said bottles, means for rotating said



drum, a scrubber and means for imparting a simultaneous rotary and reciprocating motion to said scrubber, said scrubber and drum being positioned so that the reciprocating motion of the scrubber causes it to enter and withdraw from a bottle on the drum.

3. In a bottle-washing machine, a rotary drum, means for temporarily securing a bottle thereon, means for imparting an intermittent partial rotation to said drum and a simultaneously rotating and reciprocating scrubber positioned so that the reciprocation of said scrubber causes it to enter and withdraw from a bottle secured on said drum.

4. In a bottle-washing machine, a rotary drum, means for holding bottles on the periphery thereof extending in a radial direction, means for automatically and periodically releasing said bottles, a simultaneously reciprocating and rotating scrubber positioned so that the reciprocation of the scrubber causes it to enter and withdraw from a bottle on the drum and means for introducing a stream of water into the bottle simultaneously with the scrubber.

5. In a bottle-washing machine, a rotary drum, a reciprocating and rotating scrubber comprising a hollow pipe and compressible members secured to the end thereof, a sleeve surrounding said compressible members when the scrubber is drawn back, a yielding receiver at the end of said sleeve to receive the mouth of a bottle on the drum, all positioned so that the reciprocation of the scrubber causes it to enter and withdraw from the bottle.

6. In a bottle-washing machine, a rotary drum, a series of bottle-holding jaws spaced apart circumferentially around said drum and means for opening and closing said jaws, each set of jaws diametrically opposite each other acting simultaneously and alternately to the set at right angles thereto.

7. In a bottle-washing machine, a rotary drum provided with bottle-holders, a simultaneously rotating and reciprocating scrubber positioned to enter and withdraw from a bottle supported in said holders at each reciprocation of the scrubber, means for introducing a stream of water into the bottle simultaneously with the scrubber and a brush adapted to reciprocate and rotate in contact with the outside of a bottle thus held and means for projecting a stream of water upon the outside of the bottle.

8. In a bottle-washing machine, a rotary drum provided with bottle-holding jaws and means for imparting a periodical quarter-rotation to said drum, means for holding the jaws normally against the bottle when the bottle is in a horizontal position and means

for opening the jaws to receive and discharge the bottle when in a vertical position.

9. In a bottle-washing machine, a suitable supporting-frame, a rotary drum provided with bottle-holding jaws on the periphery thereof adapted to hold bottles projecting therefrom in a radial direction, means for automatically operating said jaws to clamp or release the bottles, and a bottle-washing device consisting of a reciprocating and rotating pipe carrying on one end a scrubber consisting of flexible spring-arms, a stationary sleeve adapted to receive and compress the yielding scrubber-arms as the scrubber is drawn back and means for imparting a limited reciprocating motion to said sleeve.

10. In a bottle-washing machine, a rotary drum provided with bottle-holding devices, a simultaneously reciprocating and rotating pipe provided with a scrubber composed of spring-arms tending to spread apart, a sleeve surrounding said pipe and adapted to have an independent reciprocating motion, an outside rotary sleeve carrying a reciprocating and rotating scrubber and a reciprocating pipe adapted to discharge a stream of water contiguous to said last-named scrubber.

11. In a bottle-washing machine, a rotary drum, means for holding bottles on the periphery thereof, means for automatically and periodically releasing said bottles, a simultaneously rotating and reciprocating scrubber, a reciprocating sleeve concentric with said scrubber, said sleeve having on one end a receiver, means for reciprocating said sleeve and receiver independently of the scrubber to bring said receiver against the mouth of a bottle held on the drum, and means for reciprocating the scrubber into and out of the bottle through said sleeve and receiver.

12. In a bottle-washing machine, a rotary drum, a series of bottle-holding jaws mounted thereon, means for opening and closing said jaws, means for washing the inside and the outside walls of bottles held in said jaws, means for discharging bottles from said jaws, a series of rotating receptacles adapted to receive and support the bottles bottom up, as they are discharged from the jaws, means for rotating said receptacles periodically, a brush adapted to wash the bottom of the bottles and means for imparting a rotary and vertically-reciprocating motion to said brush.

In testimony whereof I affix my signature, in presence of two witnesses, this 25th day of May, 1901.

CHARLES A. COLE.

Witnesses:

HIRAM W. RICKER,  
ELGIN C. VERRILL.