

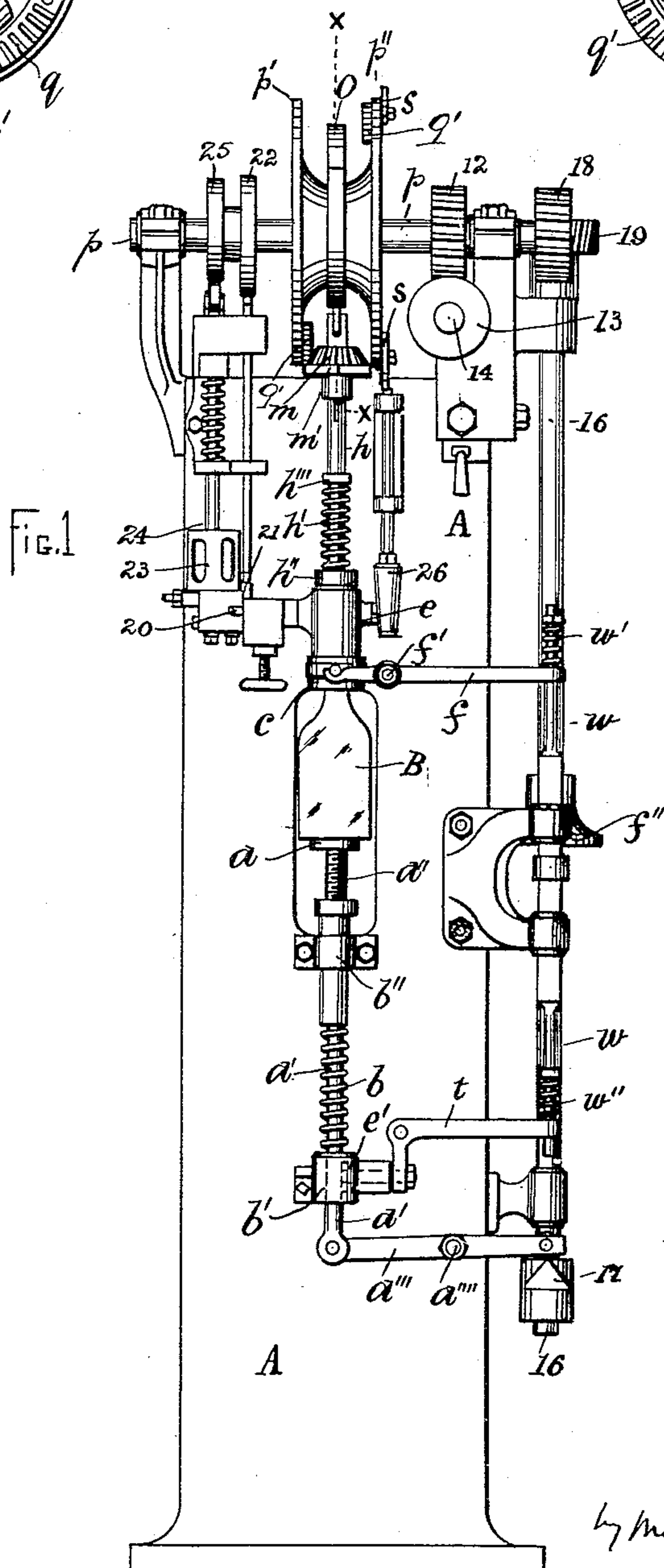
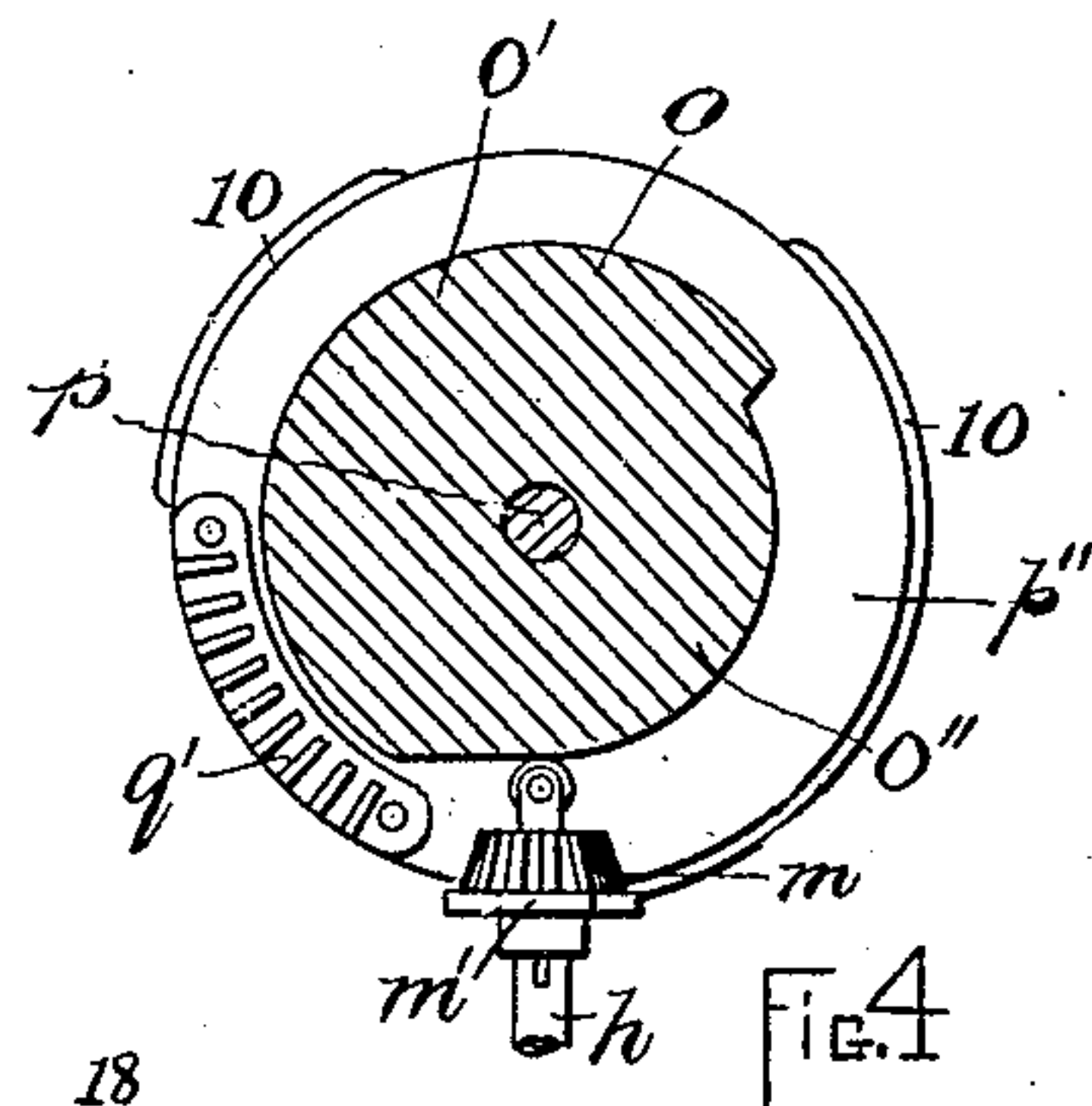
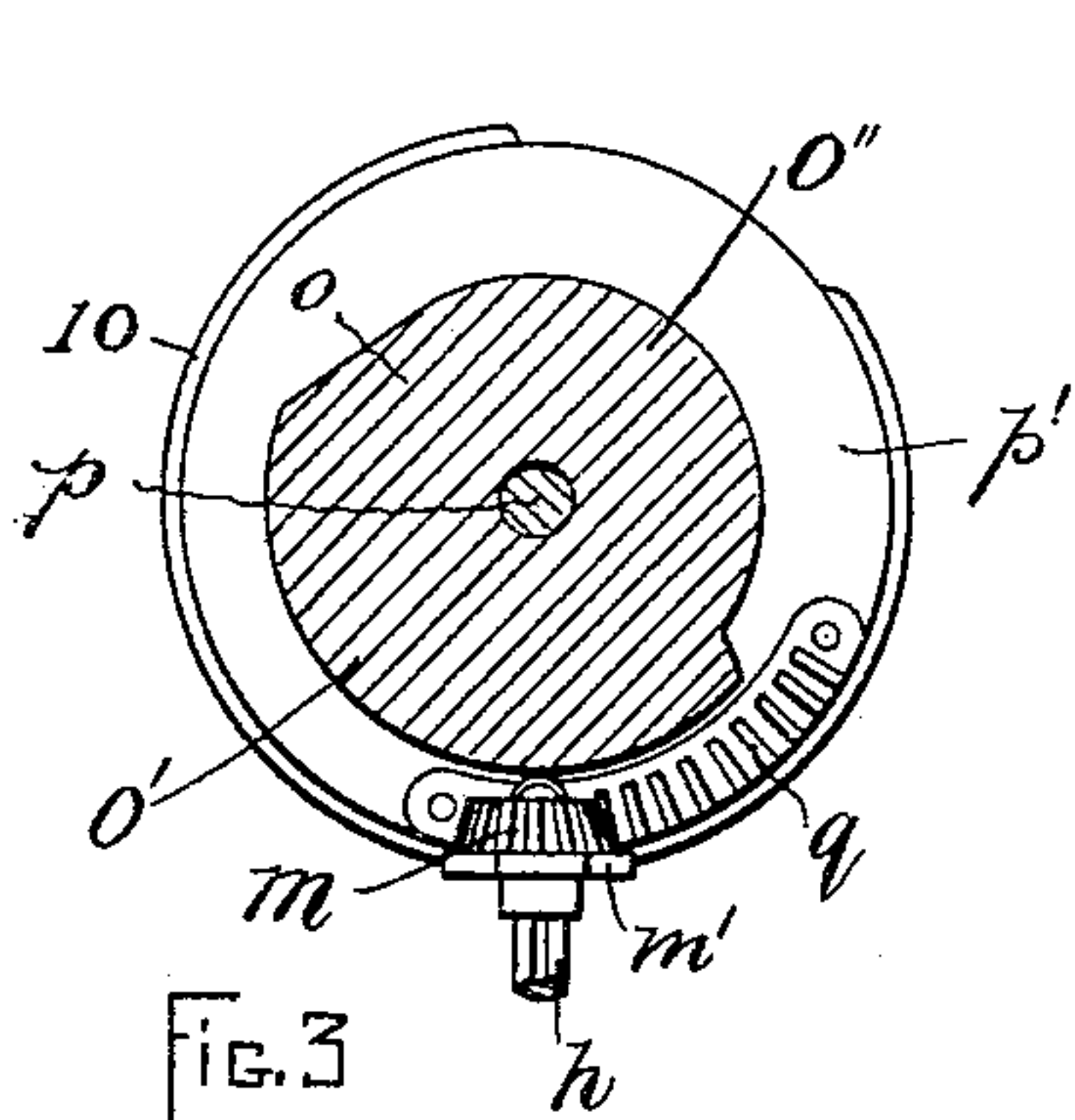
P. BINNS.

BOTTLE FILLING AND STOPPERING MACHINE.

(Application filed Mar. 22, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
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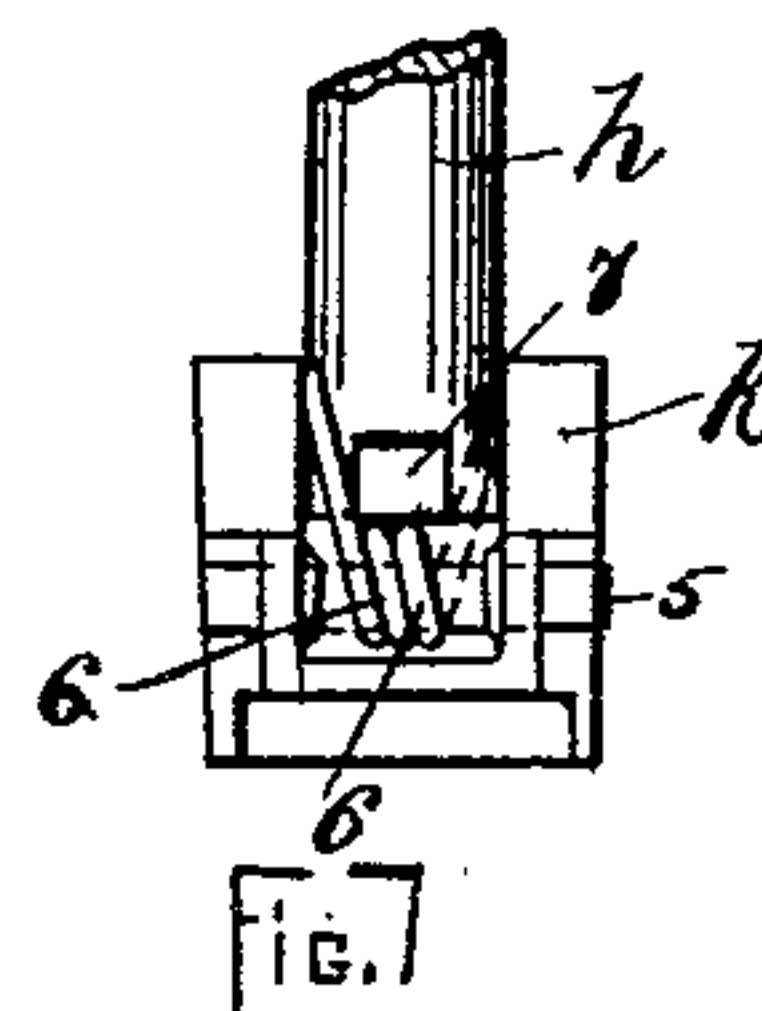
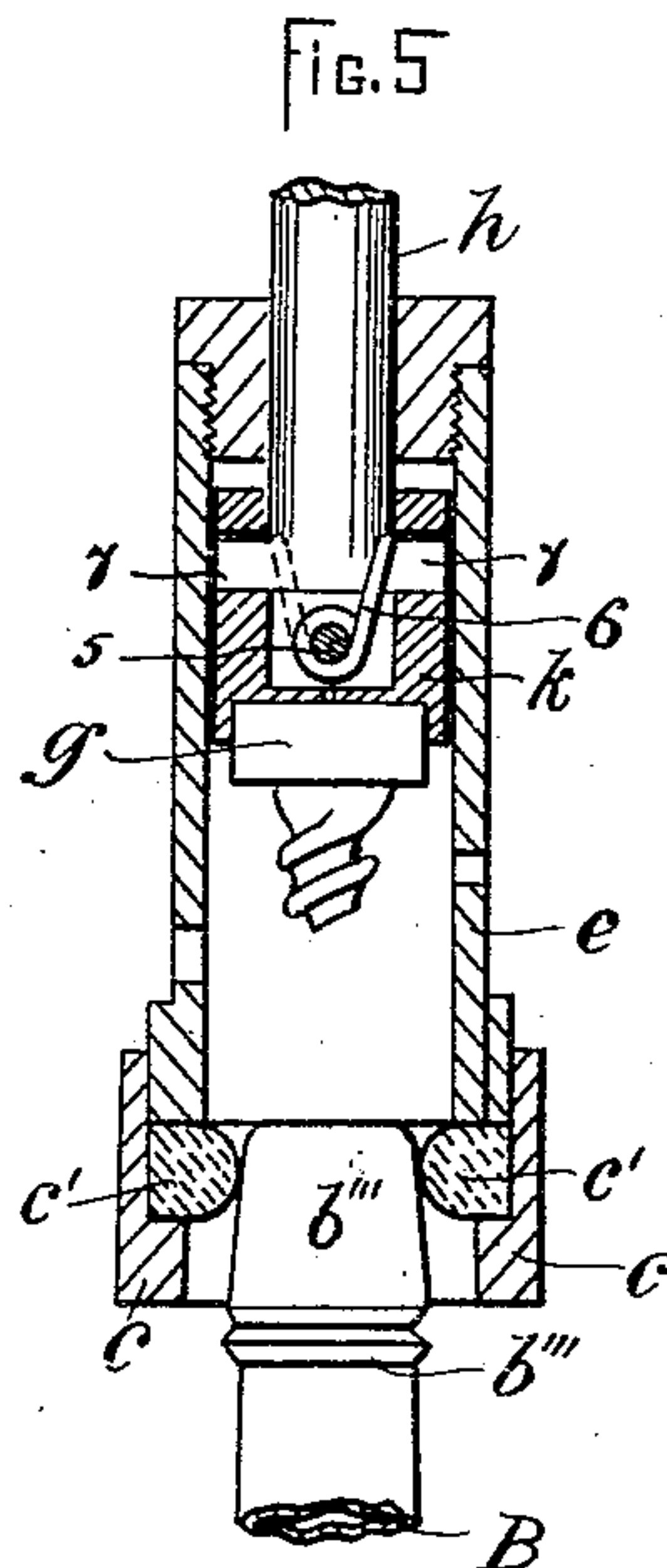
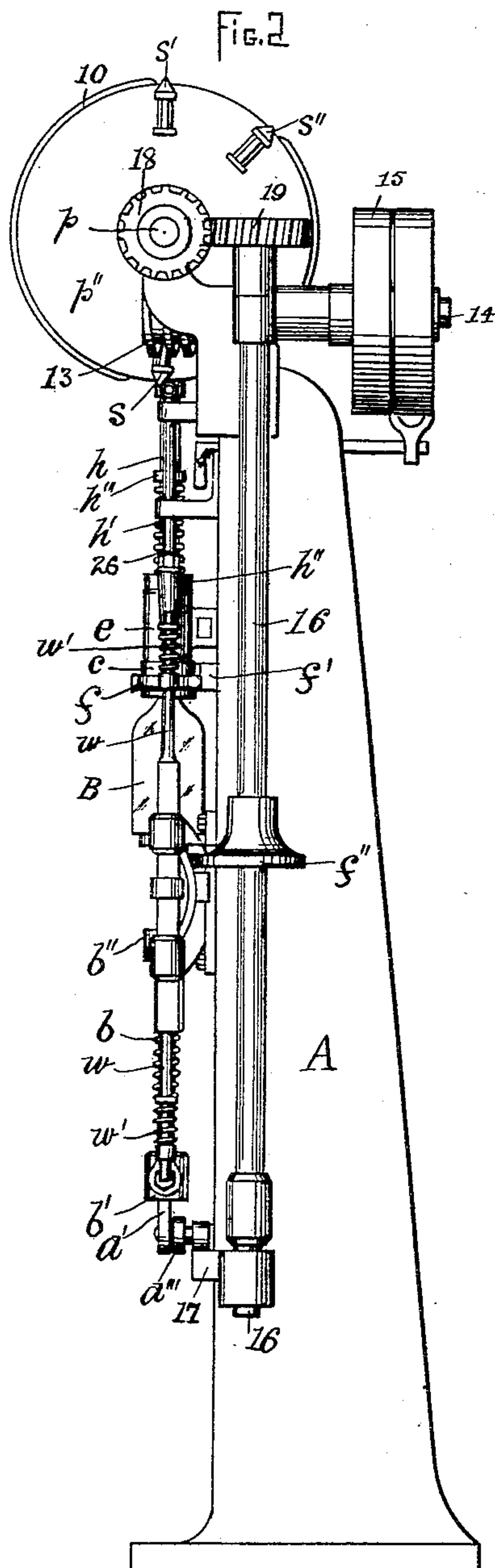
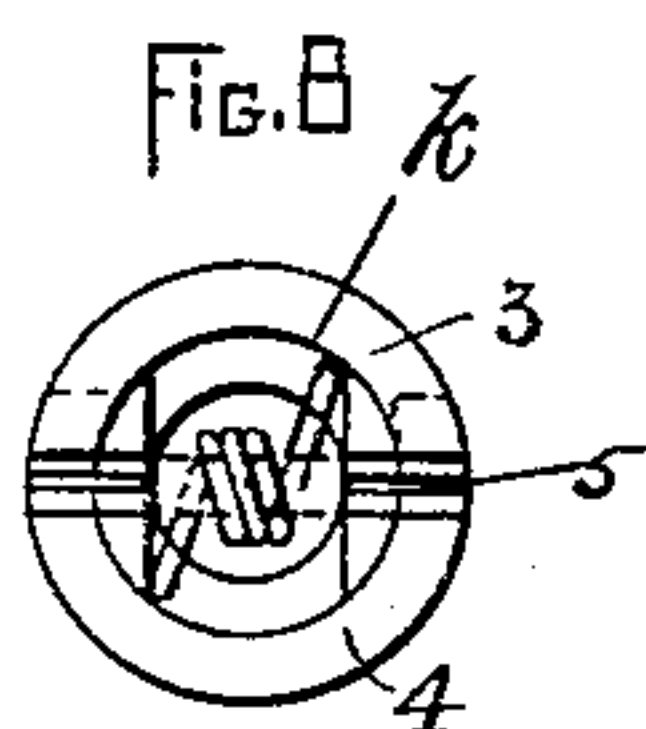
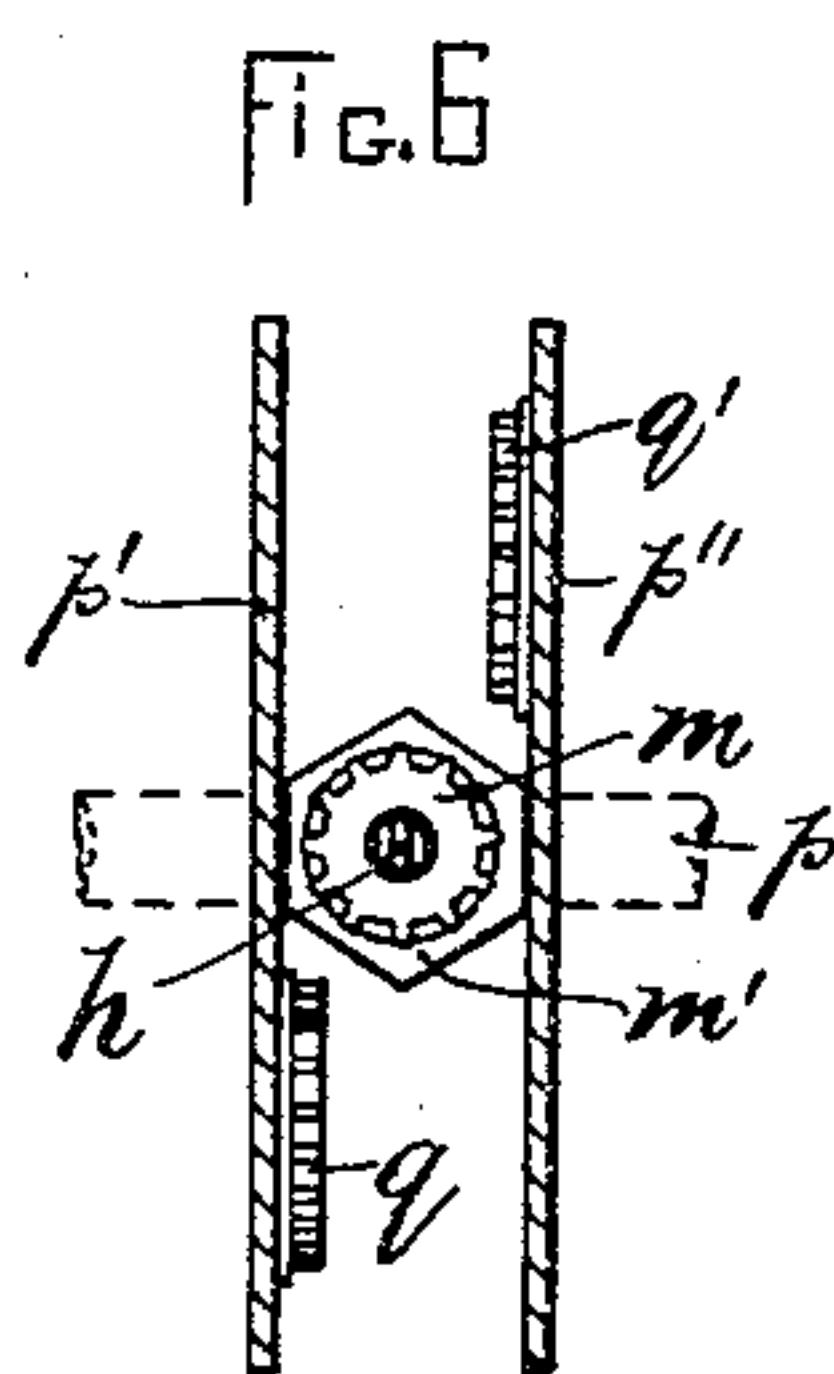
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

PICKLES BINNS, OF SHIPLEY, ENGLAND.

BOTTLE FILLING AND STOPPERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 704,171, dated July 8, 1902.

Application filed March 22, 1901. Serial No. 52,416. (No model.)

To all whom it may concern:

Be it known that I, PICKLES BINNS, a subject of the King of Great Britain, and a resident of 1 Windsor road, Shipley, in the county of York, England, have invented certain new and useful Improvements in Bottle Filling and Stoppering Machines, of which the following is a specification.

My invention relates to improvements in machines for filling and stoppering screw-stoppered bottles of the class wherein the empty bottle, with its screw-stopper, is placed in position in the machine, which on being started in motion first removes the stopper, then supplies the liquid to the bottle, and afterward screws the stopper firmly back into position in said bottle; and my said invention consists in constructing and arranging the several parts of said machinery in such a manner as to enable them to perform their functions with accuracy and precision and yet allow free access to any part thereof that may require displacing, repairing, or otherwise attending to, the whole being comparatively cheap in production. To attain this object, I make use of the devices constructed and arranged to operate as hereinafter described, and as illustrated in the accompanying sheets of drawings, wherein—

Figure 1 is a front elevation of a machine constructed in accordance with my invention. Fig. 2 is a side view of the mechanism shown by Fig. 1. Fig. 3 represents a section on line $x x$ of Fig. 1 looking toward the left from said line, the parts being shown in a different position from the representation in Fig. 1. Fig. 4 represents a section on the same line $x x$, but looking in the direction opposite to that in Fig. 3, and showing the disk p'' in another position. Fig. 5 is a sectional view, enlarged scale, of the parts for laying hold of the stopper and for clamping the neck of the bottle when being filled, as hereinafter described. Fig. 6 represents a horizontal sectional view of the disks shown in Figs. 3 and 4 and a plan view of the pinion, said figure omitting the cam and shaft between said disks in order to show the pinion. Fig. 7 is an elevation of a spring-clutch for laying hold of the screw-stopper, one jaw of which is detached therefrom. Fig. 8 is an end view of certain of the parts shown by Fig. 7 as

seen in the direction indicated by the arrow 2.

A represents the framework of the machine, and B the bottle to be filled.

The bottle B is mounted upon the yielding support a , which is kept in its normal raised position by the spring b taking loosely over its spindle a' , which is held and guided by the bearings $b' b''$, through which it slides vertically. The screwed shank a'' fits within the enlarged part of the upper end of the spindle a' , so that it may be thereby elongated or shortened by being screwed out of or into same to suit shorter or longer bottles B, the stoppers g of which it has to force, when pressed by its spring b , so that they may pass firmly within the clutch k . Within the clamping part c is a rubber ring or annular piece of other suitable material c' for contact with the bottle's neck, against the pressure of which said rubber c' is held by its clamping part c being forced against the bearing e by the lever f , pivoted at f' , operated by the cam f'' , mounted upon the vertical shaft 16, acting upon the rod w , which presses upon said lever f , through the spring w' , at which time a perfect joint is thus made between the bottle and the parts through which the liquid to be supplied thereto passes. To withdraw the support a , so that a bottle may be freely placed in position thereon, the lower end of the spindle a' is pivotally connected to the lever a''' , pivoted at a'''' and operated by the cam 17, secured to the shaft 16, this latter deriving its rotary motion from the shaft p by means of the wheels 18 and 19.

The liquid is supplied to the bottles through the tube or pipe 20, controlled by the valve 21, operated by the cam 22, secured to the shaft d , while the flavoring or syruping substances are fed thereto from the receptacle 23, wherefrom its flow is controlled by the pump 24, operated by the cam 25, also mounted upon the shaft p , this latter or syruping device being only used when liquids requiring same are being supplied to the bottles, and at all times when aerated liquids or liquids under pressure are being fed to the bottles then the relief-valve 26 is operated at appropriate times by the projections $s s' s''$, secured to the disk p'' .

The mechanism for the removing and re-

screwing of the stoppers *g* from and into the bottles B consists of a vertical shaft *h*, carrying at its lower end an appropriately-formed spring-clutch *k*, the jaws 3 4 of which are pivoted together at 5, while they are pressed to approach each other by the spring 6, mounted upon said pivotal pin 5. The laterally-projecting arms 7 on the end of the shaft *h* take into openings in the upper ends of the jaws 3 4 to secure same to said shaft and yet allow them sufficient freedom to move upon their pivotal pin 5. This clutch *k* is for laying hold of the upper part of the stopper *g* when it is forced therein against the gripping actions of the spring 6 on the bottle B, being raised vertically by its supports *a*, actuated by the spring *b*, at the time same is being moved, as hereinbefore described. Splined on the upper end of the shaft *h* is a bevel gear-wheel *m*, to which is secured the hexagonal plate *m'*, the said wheel *m* and plate *m'* so arranged that while the shaft *h* may freely slide vertically through them they will transmit motion to it when rotated. This vertical shaft is maintained in its normal raised position, as shown by Fig. 1, by means of the supporting-spring *h'*, the lower end of which rests upon the bearing *h''*, while its upper end supports the shaft *h* by reason of the collar *h'''* fixed thereon resting upon it. The upper extremity of the shaft *h* reaches into contact with the operating-cam *o*, mounted upon the horizontal shaft *p*. Upon this shaft *p* are also secured the disks *p' p''*, one situated on one side of the vertical shaft *h* and the other on the other side thereof, while toothed quadrants or segment-racks *q q'* are respectively secured to said disks *p' p''*, one to gear with the wheel *m* on one side at one time and the other to gear with it on the other side at another time. The formation of the outer edges of these disks *p' p''* by having portions thereof cut away where the racks *q q'* are situated and other portions, as at 10, made to extend beyond the path of motion of said racks *q q'*. When these latter are not in gear with the wheel *m*, the extending parts 10 will be opposite the straight parts of the periphery of the adjusting-piece *m'*, and so secure same in position and prevent any rotary motion at such time from being transmitted to the shaft *h* and further maintain the wheel *m* in position, so that it will gear properly with the next segment *q* or *q'* which is brought in contact with it as the disks *p' p''* are being rotated.

Rotary motion is transmitted to the shaft *p* by the wheel 12, worm 13, shaft 14, and driving-pulleys 15, operated by a driving-belt from any prime motor.

The actions of the devices above described are as follows: A bottle B, with its stopper *g* loosely screwed therein, is placed upon the support *a*, when this latter is withdrawn to its descended position against the pressure of the spring *a'* by its operating-cam 17. The machine being started, the cam 17 moves clear of the lever *a'''*, thereby enabling the spring

b to raise the bottle B, so that its neck *b'''* passes within the clamping part *c* and its stopper *g* is forced within the clutch *k*. The cam *f''* then operates the rod *w* in order to operate the levers *f* and *t*, (through the springs *w'* and *w''*), the former to move the sleeve *c*, which forces the rubber *c'* against the bottle's neck *b'''*, thus to form a pressure-tight joint, and the latter to force the gripping part *e'* against the spindle *a*, thus to hold it firmly in position. The segment *q'* now gears with the wheel *m*, and thus rotates the clutch *k*, within which is the stopper *g*. In this manner the latter is unscrewed and withdrawn from the bottle B, and during this time the cam *o* allows the shaft *h* to rise by means of the pressure of the spring *h'*, and during which time also the cam 25 is brought into action to supply the requisite quantity of syrup to the bottle when this is required. The part *o'* of the cam *o* now passes clear of the shaft *h*, thus allowing the spring *h'* to raise said shaft against the part *o''*, in this manner lifting the stopper *g* entirely clear of the bottle's neck *b'''*. The cam 22 for supplying the aerated water and the cams or what are commonly known as "snift-cams," *s s' s''* for operating the valve 26 for relieving the pressure within the bottle B are brought alternately into action. The further rotation of the cam *o* causes the shaft *h* to again bear upon the part *o'* thereof, upon which the segment *q* comes into gear with the wheel *m* and causes it to move in the opposite direction to that above referred to, and so screw the stopper *g* into the neck *b'''* of the bottle B, and by reason of said rack *q* being longer than the rack *q'* the stopper will be given a proportionately longer motion or turn, so that it is screwed firmly into position, and during this time the shaft *h* is being forced downward by the cam *o*. The further rotation of the cam *f''* then releases the levers *f* and *t*, and the cam 17 operates the lever *a'''* to withdraw the bottle-support *a*, and so the bottle B may be removed therefrom, after which the actions may be recommenced. The cams 22 and 25 may be moved on a keyway or feather on the shaft *p* by any suitable lever or other device in order that they may be thrown out of gear thereby with the parts which they operate at any time.

When a "still liquid" or one that is neither aerated nor under pressure is to be supplied to the bottles B, then the parts 23, 24, 25, 26, and *s s' s''* may be dispensed with.

Having thus described the nature of my said invention, what I claim is—

1. A bottle-filling machine comprising adjustable supports for the bottle, a clamp for grasping the neck of the bottle, a vertically-moving shaft having a clutch for removing and replacing a stopper, said clutch comprising a horizontal pin at the end of the shaft, two clutching-jaws pivoted on the pin and a spring coiled about said pin and having its ends bearing outwardly upon the portions of

the jaws above the pin, substantially as herein specified.

2. A bottle-filling machine comprising a vertically-movable and yieldingy-supported spindle on which the bottle is adapted to rest, a lever connected with said spindle, means for intermittently and positively holding the lever to prevent upward movement of the spindle, a shaft above and in alinement with the spindle, means for alternately rotating said shaft in opposite directions, a clutch at the lower end of the shaft said clutch comprising a horizontal pin at the end of the shaft, two clutching-jaws pivoted on the pin and a spring coiled about said pin and having its ends bearing outwardly upon the portions of the jaws above the pin, substantially as herein specified.

3. A bottle-filling machine comprising a support for the bottle, a vertically-movable shaft having a stopper-clutch at its lower end, means for vertically moving said shaft, a pinion splined on said shaft, and a horizontal power-shaft above the stopper-shaft, said power-shaft having two disks provided with segmental gears adapted to alternately engage and rotate the pinion and the stopper-shaft, said pinion having a polygonal plate or flange, and the disks having surfaces at the

ends of the segmental gears to bear on the straight sides of the polygonal flange to hold the pinion from turning when not engaged by the segmental gears.

4. A bottle-filling machine comprising a support for the bottle, a vertically-movable shaft having a stopper-clutch at its lower end, a spring for normally pressing said shaft upward, a pinion splined on said shaft, and a horizontal power-shaft above the stopper-shaft and having two disks provided with segmental gears adapted to alternately engage and rotate the pinion and the stopper-shaft, and a cam between the disks and adapted to bear on and depress the stopper-shaft against the action of its elevating-spring, said pinion having a polygonal plate or flange, and the disks having surfaces at the ends of the segmental gears to bear on the straight sides of the polygonal flange to hold the pinion from turning when not engaged by the segmental gears.

In testimony whereof I have affixed my signature in presence of two witnesses.

PICKLES BINNS.

Witnesses:

JOHN WHITEHEAD,
PICKLES BAILEY.