

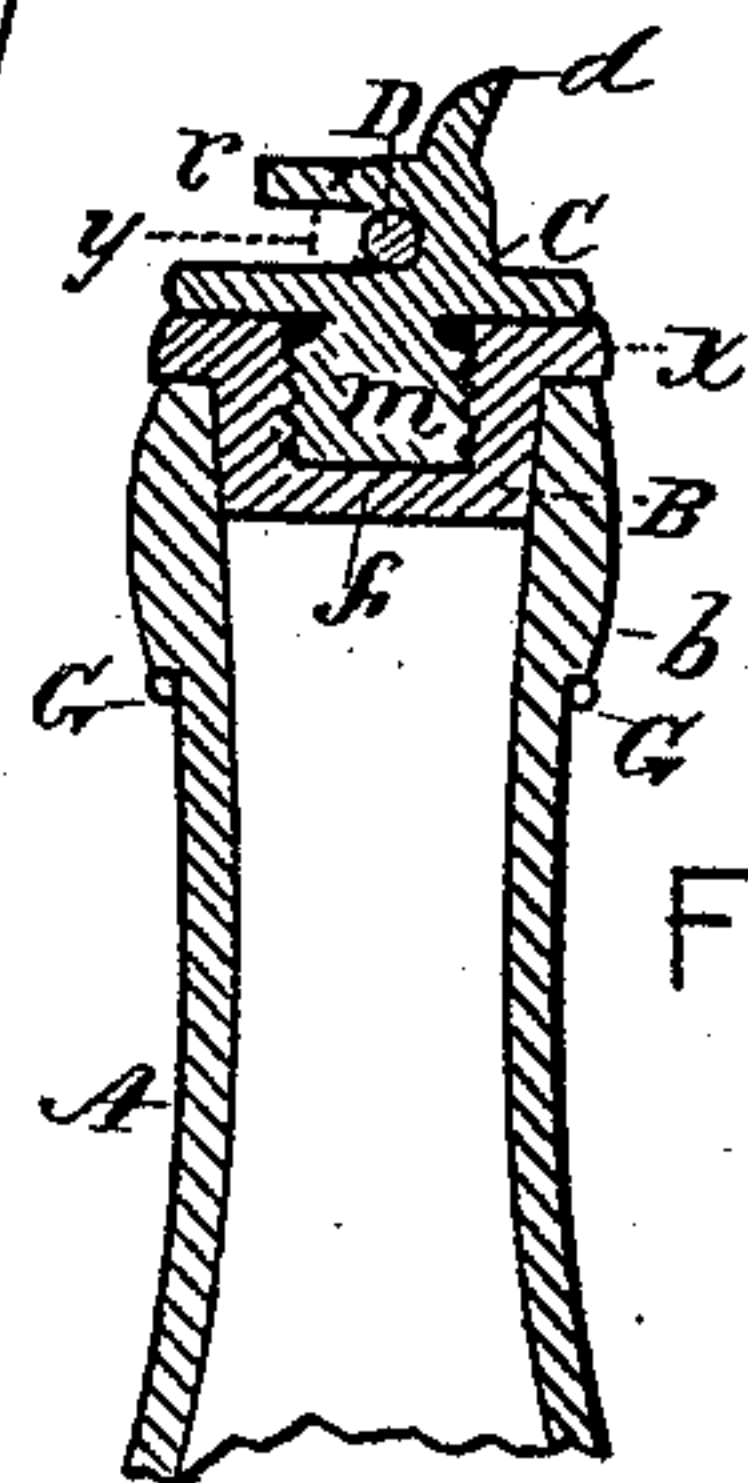
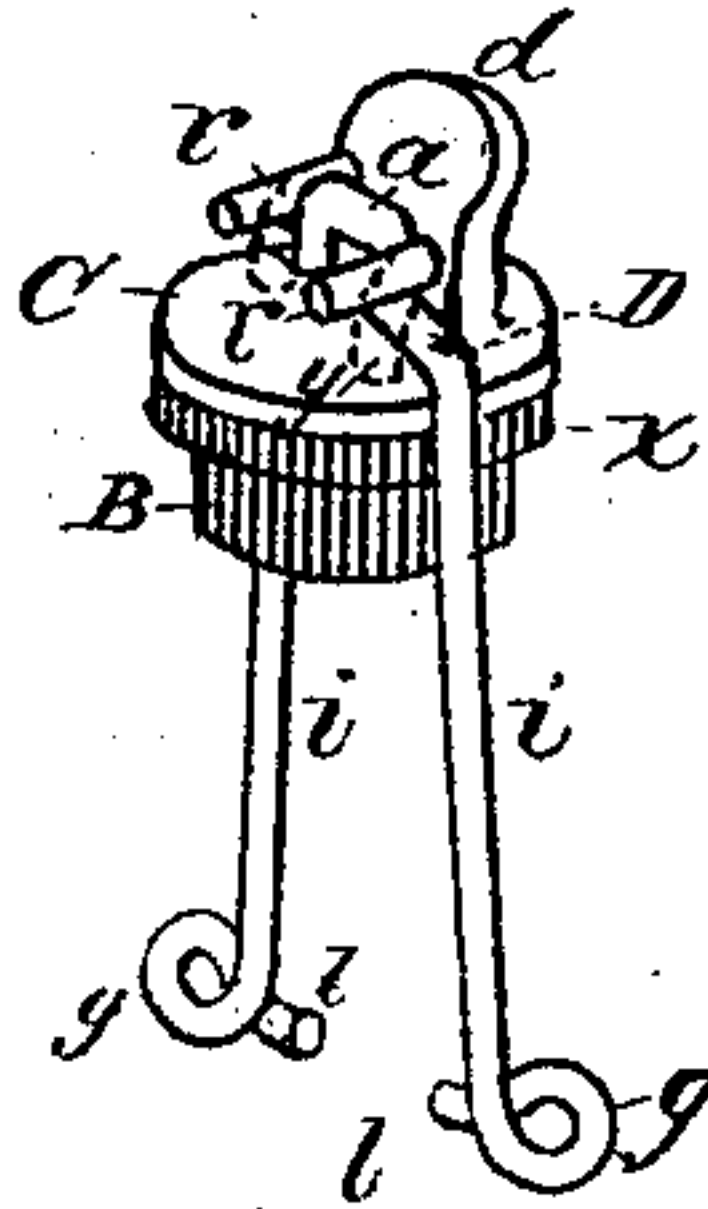
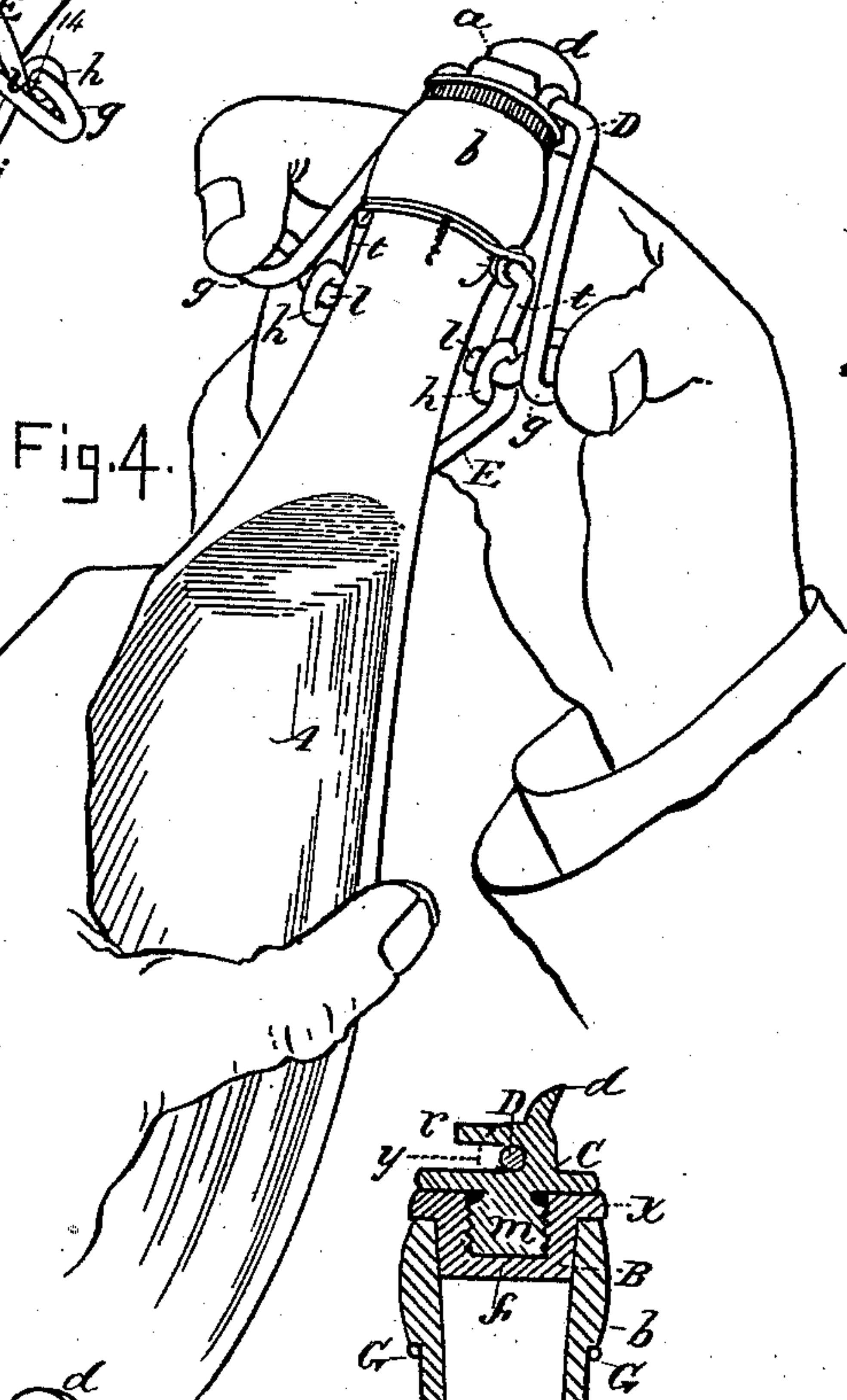
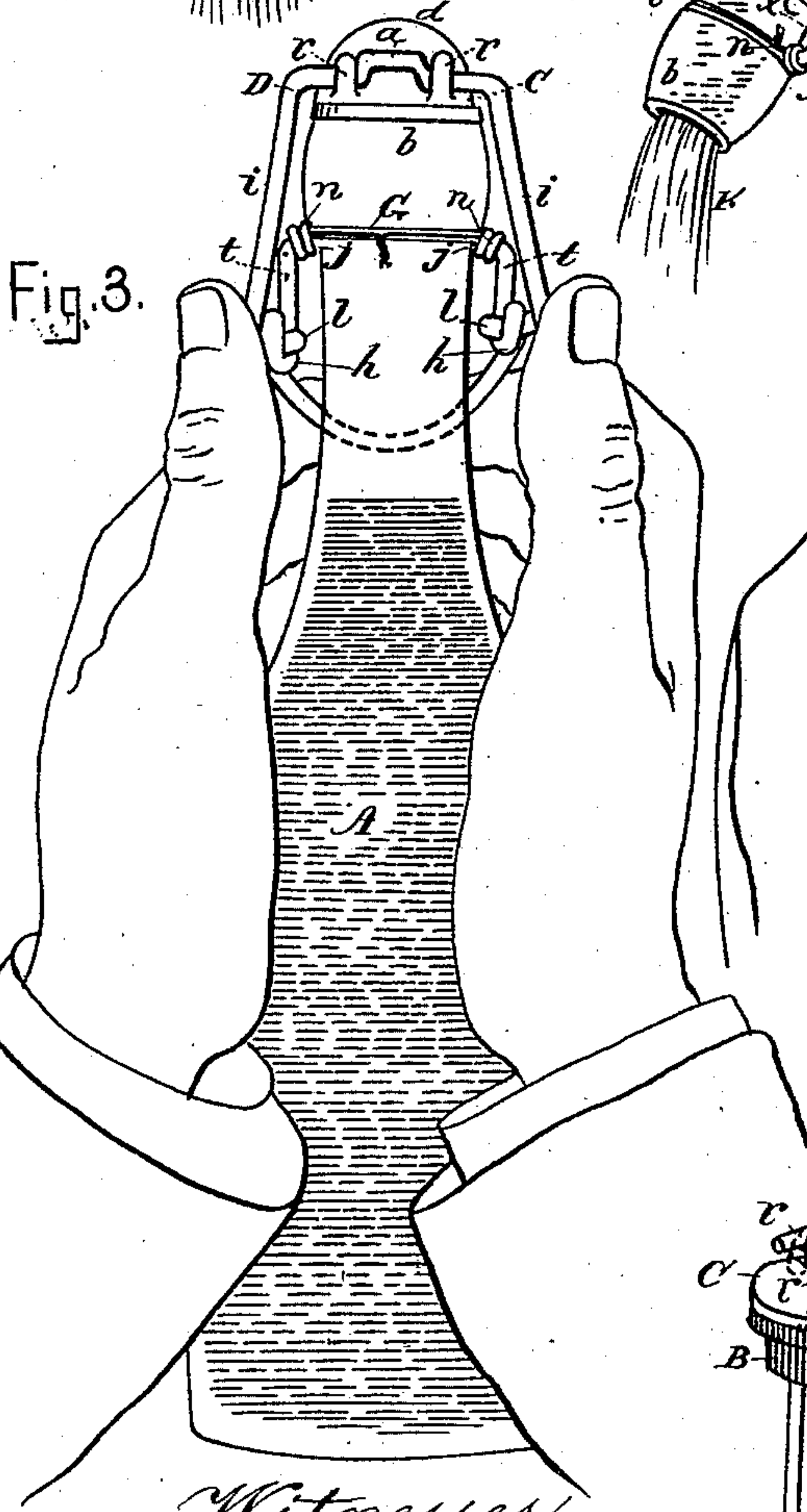
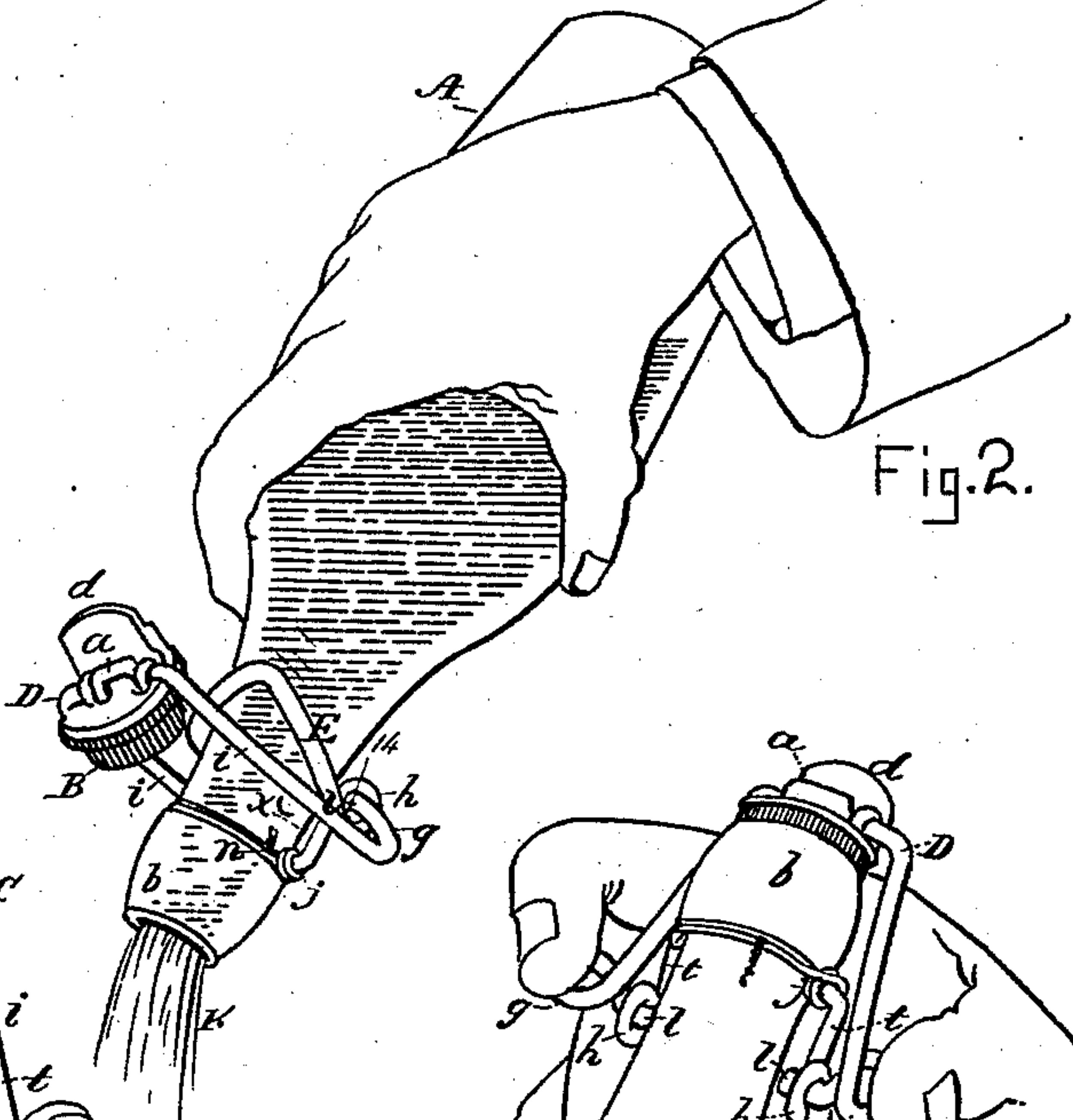
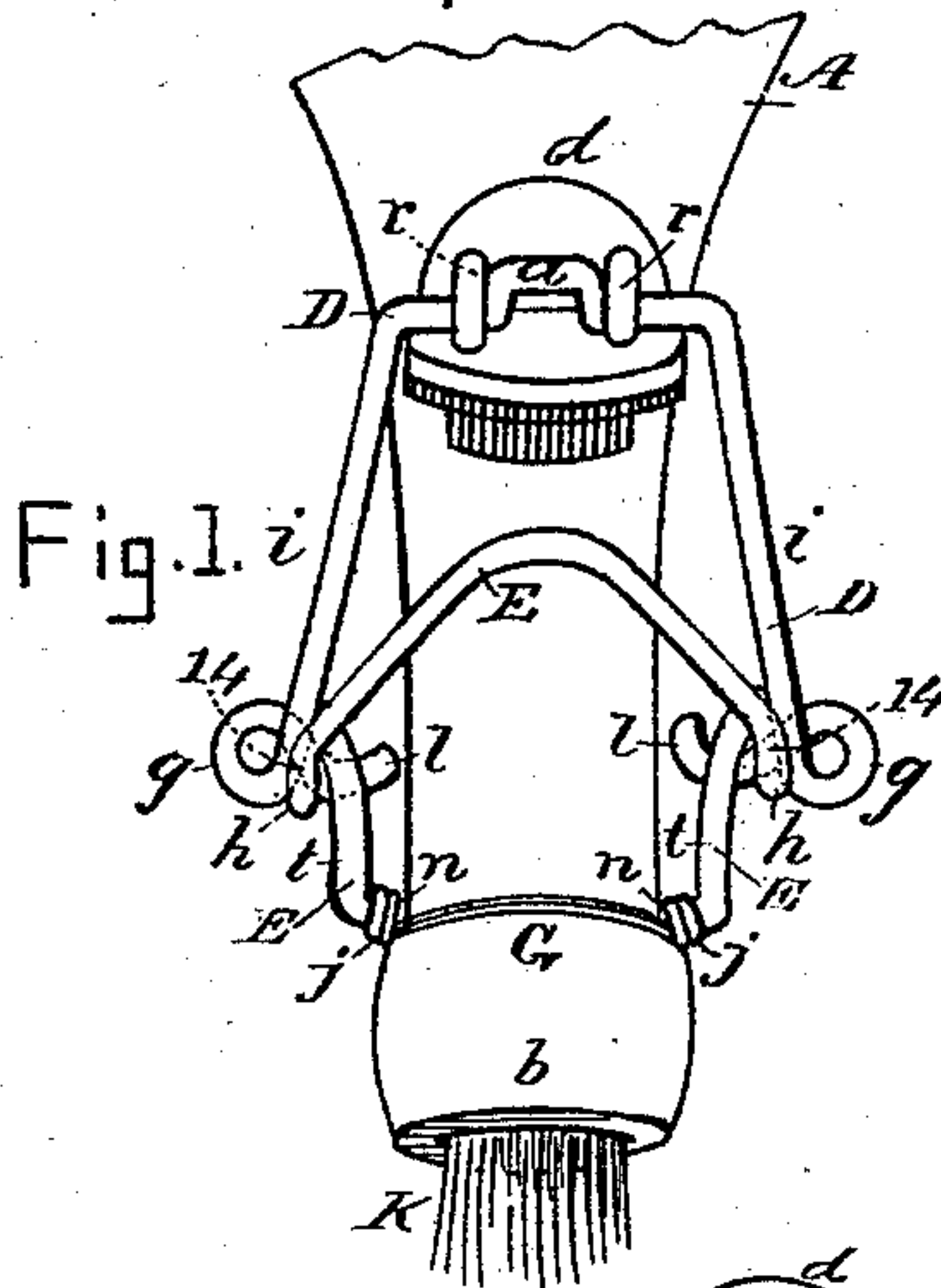
(Model.)

3 Sheets—Sheet 1.

L. S. HOYT.
BOTTLE STOPPER.

No. 285,132.

Patented Sept. 18, 1883.



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(Model.).

3 Sheets—Sheet 2.

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Fig 7

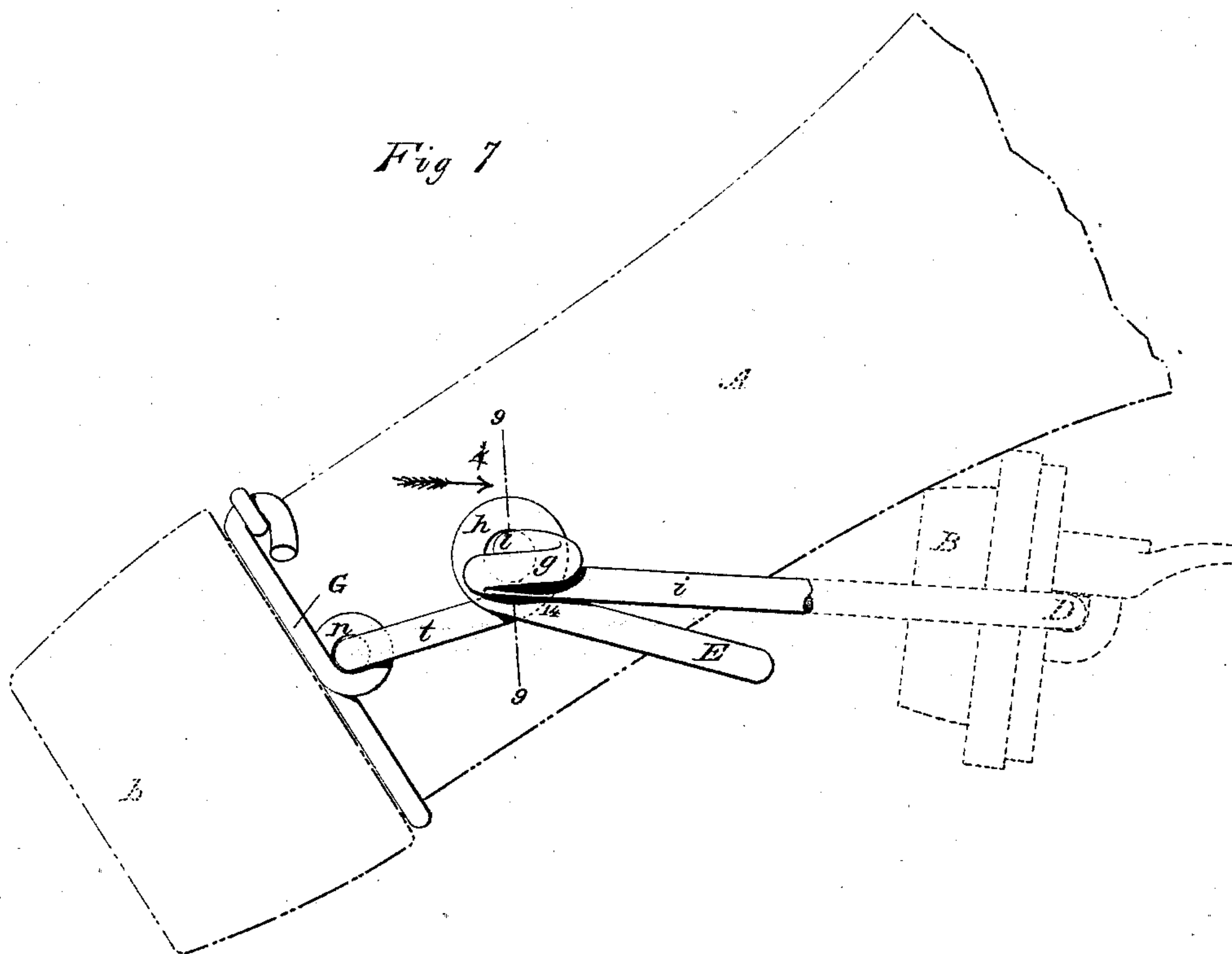


Fig 9

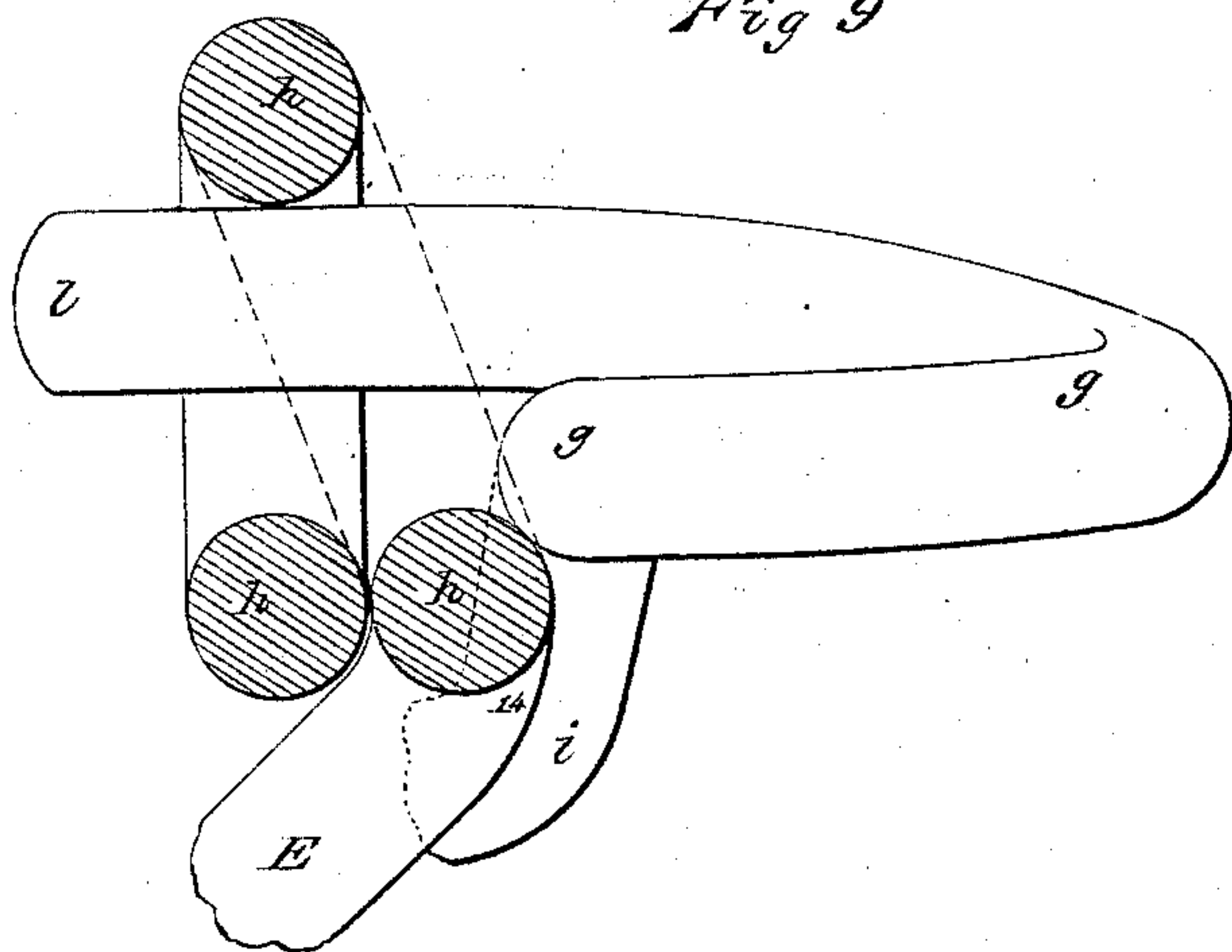
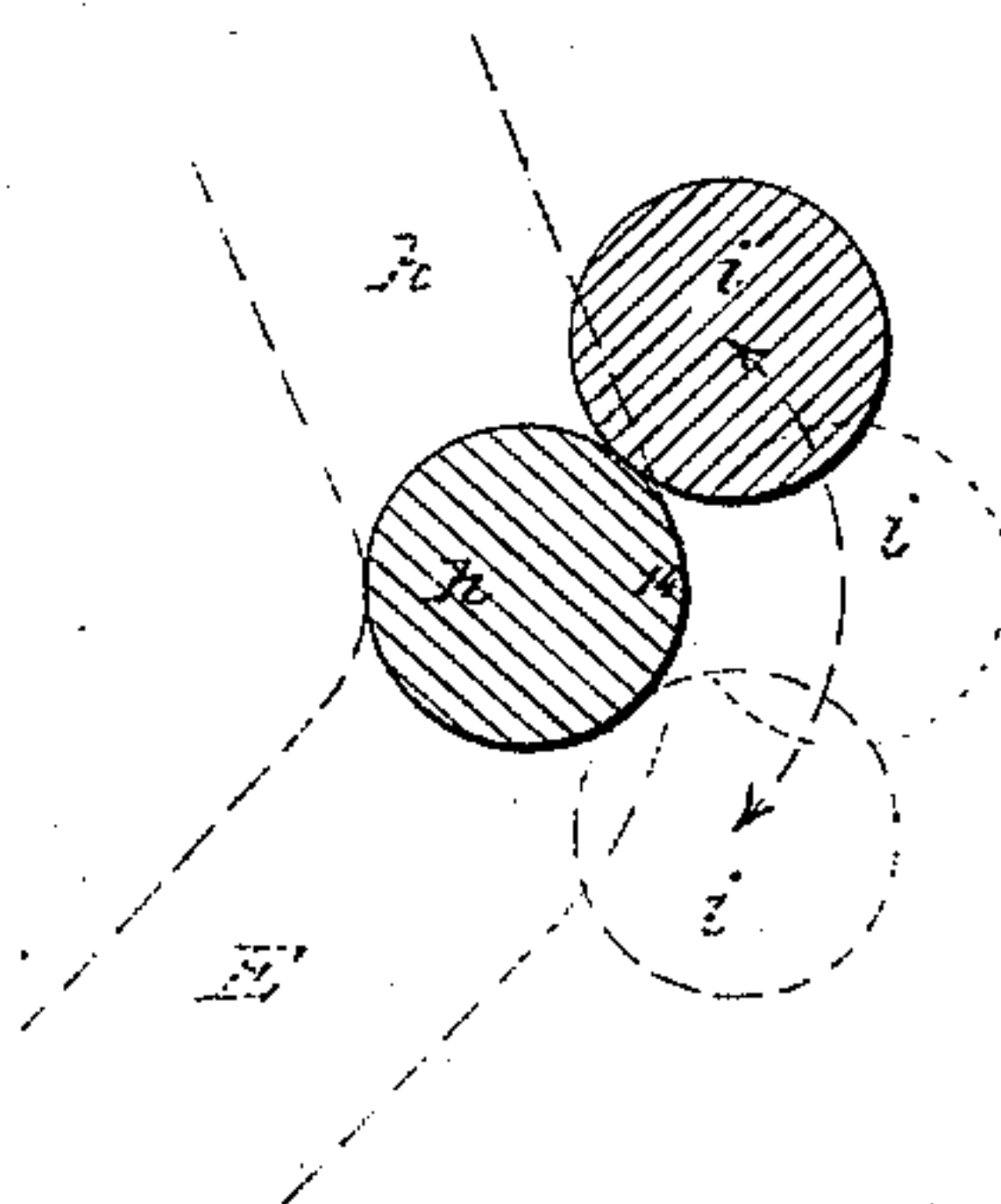


Fig 10.



WITNESSES

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(Model.)

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Fig 8.

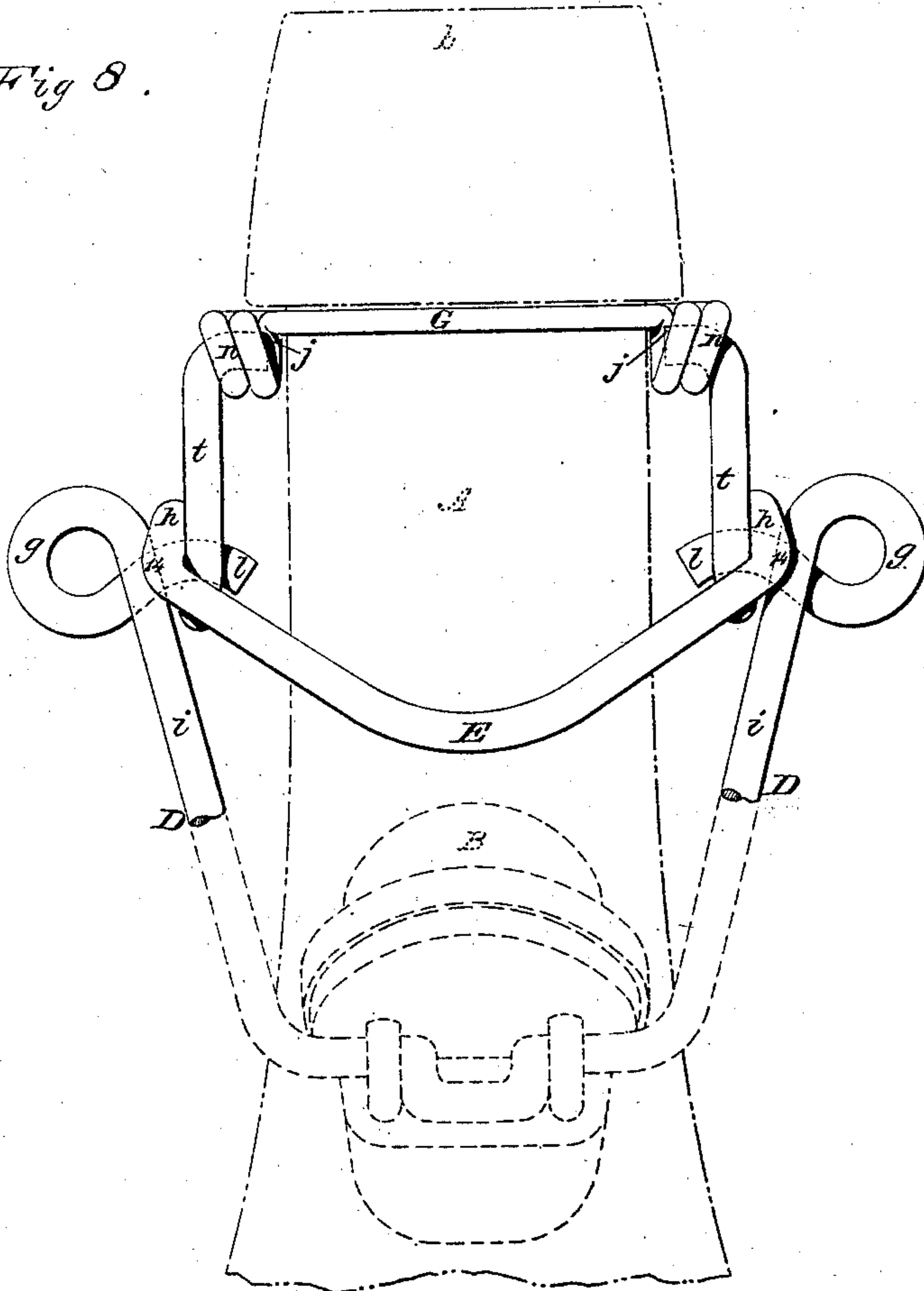


Fig 11.

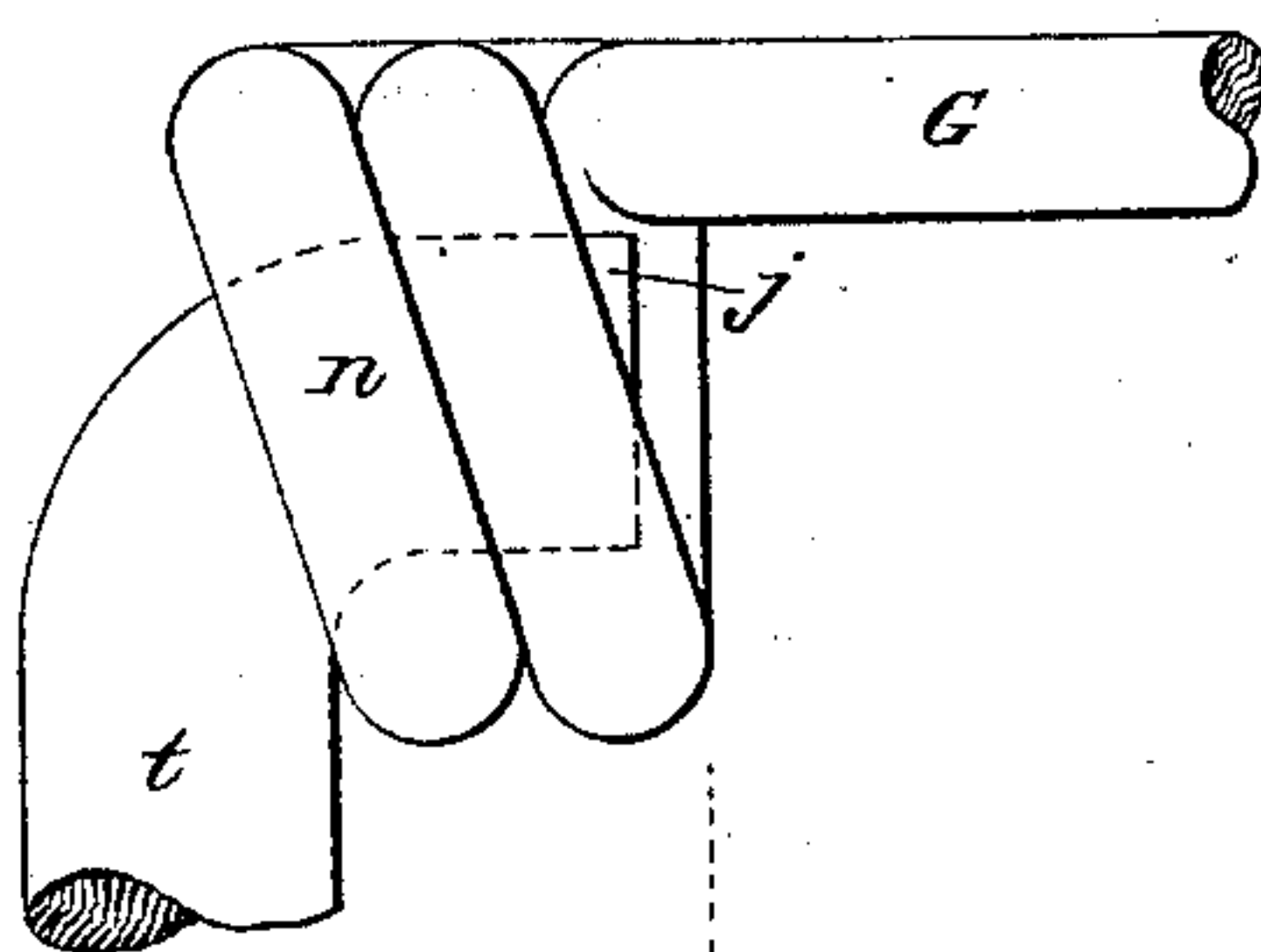
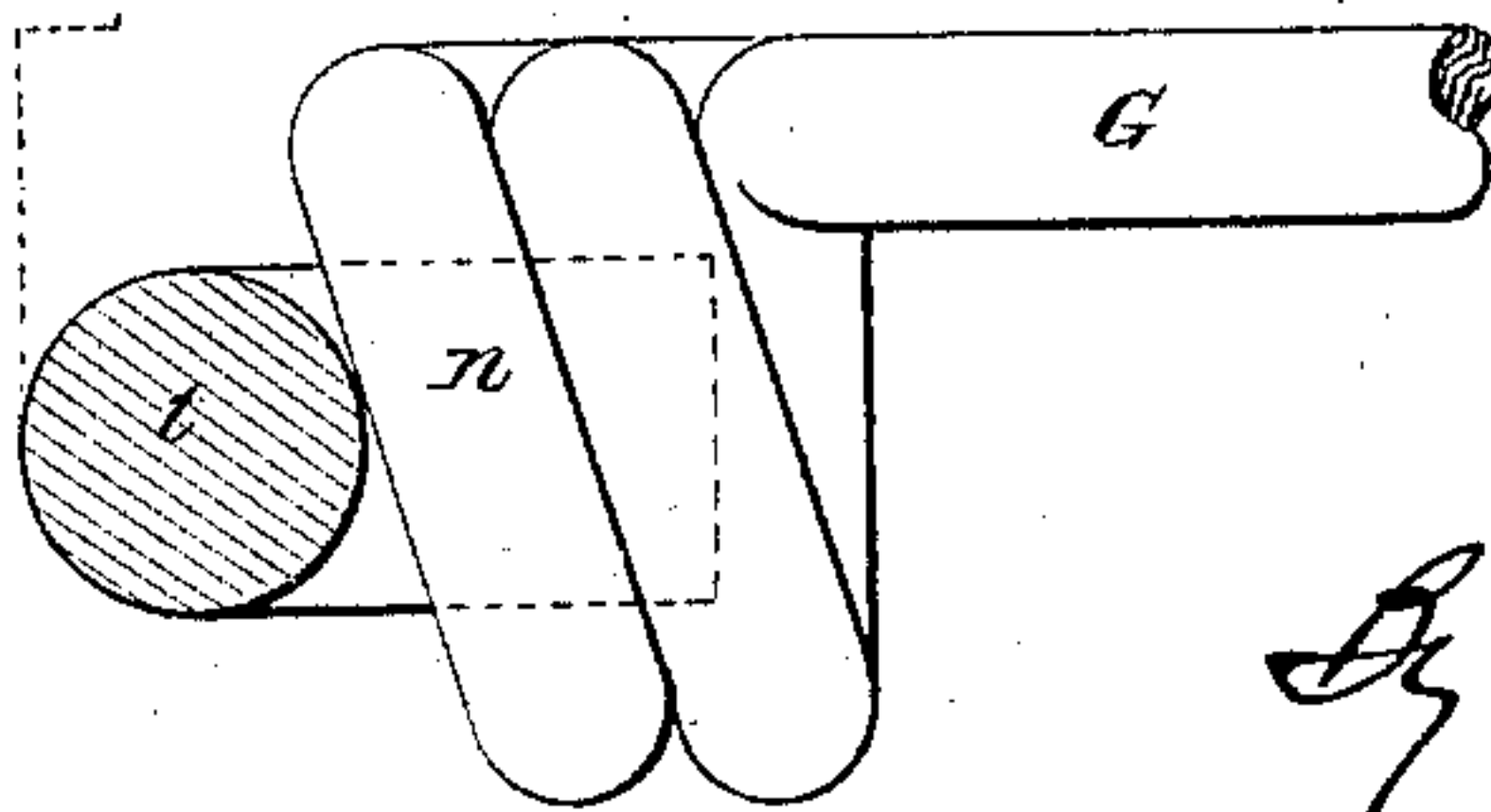


Fig 12.



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UNITED STATES PATENT OFFICE.

LEWIS S. HOYT, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND CHARLES ALBERT SHAW, OF SAME PLACE.

BOTTLE-STOPPER.

SPECIFICATION forming part of Letters Patent No. 285,132, dated September 18, 1883.

Application filed May 5, 1883. (Model.)

To all whom it may concern:

Be it known that I, LEWIS S. HOYT, of Boston, in the county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Bottle-Stopples, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is an isometrical perspective view representing my improved stopple in use, the bottle being open and the stopple proper thrown fully back; Fig. 2, a like view, showing the stopple proper partially thrown back; Fig. 3, a side elevation, representing the bottle closed, and showing one position in which it may be held in opening it; Fig. 4, a perspective view, also representing the bottle closed, and showing another position in which it may be held in opening; Fig. 5, an isometrical perspective view, showing the method of forming the cap-hinge; Fig. 6, a vertical longitudinal section of the stopple and cap; and Fig. 7 is an enlarged side view of this improved stopper-fastener, showing the positions of the binding-wire and lever when the stopper is thereby held up in contact with the neck of the bottle while the contents of the latter are being poured out. Fig. 8 is an enlarged front view of the stopper-fastener in the position shown in side view in Fig. 7, showing the binding-wire held behind the overlapping angular bends of the lever, and the cam-shaped coils of the attaching-wire which hold the lever-wire in contact with the bottle. Fig. 9 is an enlarged transverse section of one of the pivot-joints of the lever and binding-wire, taken on line 9 9 of Fig. 7, looking from the direction of the mouth of the bottle, showing the journal end of the binding-wire in the coil of the lever. Fig. 10 is a diagram showing how the binding-wire passes over the angle of the lever-wire when the bottle is opened or closed. Figs. 11 and 12 are enlarged diagrams, showing the different positions which the ends of the lever assume in the coils of the attaching-wire when the stopper is in open and closed positions, respectively.

Like letters of reference indicate corresponding parts in the different figures of the drawings.

My invention relates, principally, to means for readily opening and closing the bottle and for holding the stopple in a proper position when the bottle is open; and it consists in a novel construction and arrangement of the parts, as hereinafter more fully set forth and claimed, by which a more effective device of this character is produced than is now in ordinary use.

The nature and operation of the improvement will be readily understood by all conversant with such matters from the following explanation.

In the drawings, A represents the bottle, B the stopple proper, and C the cap.

The stopple is composed of rubber, and is provided with an outwardly-projecting annular flange, *x*, which rests on the top of the bottle when the stopple is in use. The cap is preferably composed of metal, and is provided on its upper side with the flange or thumb-piece *d*, standing slightly to one side of its center, and on its under side with the nipple *m*. The nipple is threaded exteriorly and the stopple connected to the cap by screwing the nipple into a central hole or aperture, *f*, formed in the upper part of the stopple, the diameter of the hole being somewhat less than that of the nipple, which acts as a tap to thread the hole as the parts are screwed together, and thus hold them more securely in position. A binding wire or yoke, D, passes over the top of the cap, and is provided at its center with the upwardly-projecting loop *a*. This wire has two downwardly-projecting arms, *i*, which are bent at their lower ends to form the coils *g*, and terminate in the inwardly-projecting ends *l*, which form journals for this wire. A lever, E, composed of a single piece of wire, is bent to form a coil, *h*, on either side of the bottle, and terminates in the inwardly-projecting ends *j*.

An attaching-wire, G, is secured to the neck of the bottle, below the head *b*, the ends *j* of the lever E being journaled in coils *n*, formed in said attaching-wire on either side of the bottle, and the ends *l* of the wire D journaled in the coils *h* of the lever E.

The cap C and its stopple B are secured to the wire D by means of a pin, *r*, disposed on either side of the loop *a*, the pins being cast into the flange *d*, arranged at right angles thereto, and afterward bent down over the wire, as shown by the dotted lines *y* in Figs. 5 and 6, thereby hinging the cap to the wire. It will be obvious that two loops and one pin may be used, instead of one loop and two pins, if desired, the pin being arranged between the loops.

In the use of bottles having a binding-wire and lever, as ordinarily constructed, for securing the stopple, much difficulty is experienced in opening the bottle, and also in controlling the stopple after the bottle is opened to keep it away from the emerging stream as the contents are poured out, and in a proper position for use in again closing the bottle.

In many stopper-fasteners the cap of the stopple proper is connected to the binding-wire by a loop, through which the wire passes, no provision being made to prevent the cap and its attached stopple from revolving on the wire when the bottle is opened, so that when it becomes necessary to close the bottle the stopple is frequently in an inconvenient position for that purpose. The binding-wire carrying the stopple is also sometimes so connected to the other parts that when the bottle is opened the wire and stopple are left unconfined, and are liable to fall down into the path of the stream emerging from the bottle, and thereby cause its contents to be spilled. These difficulties are fully overcome by my improvement.

In my improved stopple it will be obvious that the vertical flange *d* and loop *a* prevent the stopple from revolving on the binding-wire through more than a quarter part of a circle, as the flange comes in contact with the loop at one extreme of the rotary movement of the stopple on the wire, and the face of the cap comes in contact with said loop at the other extreme of the rotary movement; and it will further be obvious that the loop and bent pins *r* prevent it from slipping to either side or down the arms *i*, thus always keeping it in proper position for use. The flange or thumb-piece *d* is also a great assistance in throwing the stopple from its seat when it is not thrown out by the expansive action of the contents on releasing the lever E, and also in readily guiding the stopple into its seat on or in the bottle when closing it.

The operation of opening a bottle provided with this improved stopper-fastener is as follows: The bottle is held between the hands, with the lever E behind or under its neck, and the thumbs resting against the coils *g*, as illustrated in Fig. 3. The coils *g* are then pushed outward, and as soon as the ends *l* pass the dead-center the lever E is raised to a horizontal position by the spring action of the coils *g* on the ends *l* in the coils *h* of the lever, and the elasticity of the rubber flange *x* of the stopper, and the stopper thereby released.

The stopper is then thrown off from the mouth of the bottle, either by the expansive action of the contents of the bottle or by a touch of the finger on the flange *d* of the stopper. When the stopper is so thrown off, the lever E falls or springs against the neck of the bottle, and the binding-wire D, carrying the stopper, then stands out in a horizontal position, as shown in Fig. 2. The lever E remains in this position against the neck of the bottle when the latter is reversed to discharge its contents, owing to the friction of the inner sides of the arms *t* thereof against the cam-shaped coils *n* of the attaching-wire G, as clearly shown in Fig. 8, the lever being so constructed that the arms *t* tend to spring inward.

The horizontal position of the binding-wire is generally maintained by the contact of the inner ends of coil *g* with the angular bends 14 of the lever; but if said wire swings down, the stopper cannot reach the mouth of the bottle to interfere with the discharge of the contents thereof, but, owing to the retention of the lever against the bottle-neck, as aforesaid, the stopper will rest against the head of the bottle above the mouth. It is preferable, however, when the stopper is thrown off from the mouth of the bottle, to press it down against the neck thereof, and when the bottle is reversed to discharge its contents the stopper will remain against the neck, entirely out of the way of the mouth, as shown in Figs. 1 and 7. This position of the stopper is maintained as follows: The lever E, which is held against the neck of the bottle by the cam-shaped coils *n* of the attaching-wire, as aforesaid, is provided where it is jointed to the binding-wire D with abrupt outwardly-projecting angular bends 14.

The binding-wire D is so constructed that its arms *i* have a tendency to spring inwardly, the normal spread of the arms being less than the distance between the angular bends 14 of the two arms or coils of the lever E. As the stopper is pressed back against the neck of the bottle the arms *i* of the binding-wire expand and ride over the bends 14 of the lever, as shown in Fig. 10, the said lever springing out slightly from the neck of the bottle as the wires *i* pass the center of the wires *h* of the lever. The arms *i* being then behind the angles 14, the latter serve to hold the binding-wire, so that the stopper remains against the neck of the bottle, as aforesaid. Thus, whichever position the parts assume, after the bottle is opened the stopper will be automatically held away from the mouth of the bottle, so as not to interfere with the stream discharged therefrom.

The closing of a bottle provided with this improved stopper is effected as follows: The stopper is swung up into position into and over the mouth of the bottle, the arms *t* of the lever E riding up on the inclined or cam-shaped coils *n*, as indicated in Fig. 11, said lever assuming a horizontal position. The lever is then forced down to secure the stopper to its seat, and when the flange *x* is com-

pressed on its seat to the fullest extent the spring-coils *g* yield sufficiently to permit the ends *l* to pass the center or ends *j*, and thereby lock the stopper in position. In this respect the spring-coils perform an additional and important function, enabling the bottle to be opened and closed with facility, preventing injury to the parts, and enabling a leather or comparatively inelastic stopper proper to be used, if desired.

The bottle may also be opened by holding it in the left hand, as shown in Fig. 4, with the lever *E* underneath, and placing the thumb and forefinger on the springs *g*, pulling the springs downward or outward until the ends *l* pass the center or ends *j*, after which, while still holding onto the springs, the hand may be passed upwardly over the flange *d*, to tip the stopple out of its seat and bring the levers *i* into the position shown in either Fig. 1 or 2, as desired.

In stopples of this character the stopple proper is sometimes attached to the cap by means of a flanged stud which projects downwardly from the under side of the cap and is inserted in a hole in the stopple, the hole being smallest at its opening, so as to hug the neck of the stud; but stopples so constructed are difficult to manufacture and not easily attached to the cap—objections which are fully overcome by the use of the screw-nipple *m* and a stopple provided with a proper unthreaded hole to receive the same, as described.

I do not confine myself to using a rubber stopple, or to hinging the cap to the binding-wire by means of the pins *r*, or securing the stopple to the cap by the screw *m*, as a different stopple and other means may be used, if desired.

Having thus explained my invention, what I claim is—

1. The improved bottle-stopper herein described, the same consisting of the cap *C*, provided with the flange *d*, pins *r*, and stopple *B*, the binding-wire *D*, provided with the springs *g*, ends *l*, and loop *a*, the lever *E*, pro-

vided with coils *h* and ends *j*, and the attaching-wire *G*, provided with the coils *n*, constructed, combined, and arranged to operate substantially as set forth.

2. In a bottle-stopper substantially such as described, the binding-wire *D*, provided with the loop *a*, in combination with the hinged-cap *C*, having the flange *d*, substantially as set forth.

3. In a bottle-stopper substantially such as described, a lever for exerting a strain on the binding-wire carrying the stopple proper, in combination with means for automatically forcing and holding said lever against the neck of the bottle when the stopple is released and thrown from its seat, substantially as set forth.

4. In a bottle-stopper substantially such as described, a binding-wire carrying the stopple proper, in combination with means for holding said wire at or nearly at a right angle to the neck of the bottle, and with means for holding it at such an angle as to keep said stopple proper or its cap against the side of the bottle when the stopple is released and thrown from its seat, substantially as specified.

5. In a bottle-stopper substantially such as described, the binding-wire *D*, having the springs *g* and inwardly-turned ends *l*, and the lever *E*, having the inwardly-turned ends *j*, in combination with a stopple proper hinged to said binding-wire, and with means for attaching said lever to the bottle, substantially as set forth.

6. In a bottle-stopper substantially such as described, the attaching-wire *G*, provided with the inclined coils *n*, in combination with the lever *E*, substantially as and for the purpose specified.

7. In a bottle-stopper substantially such as described, the pins *r*, in combination with the flange *d*, for hinging the cap *C* to the wire *D*, substantially as specified.

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Witnesses:

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