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Patented Oct. 8, 1901.

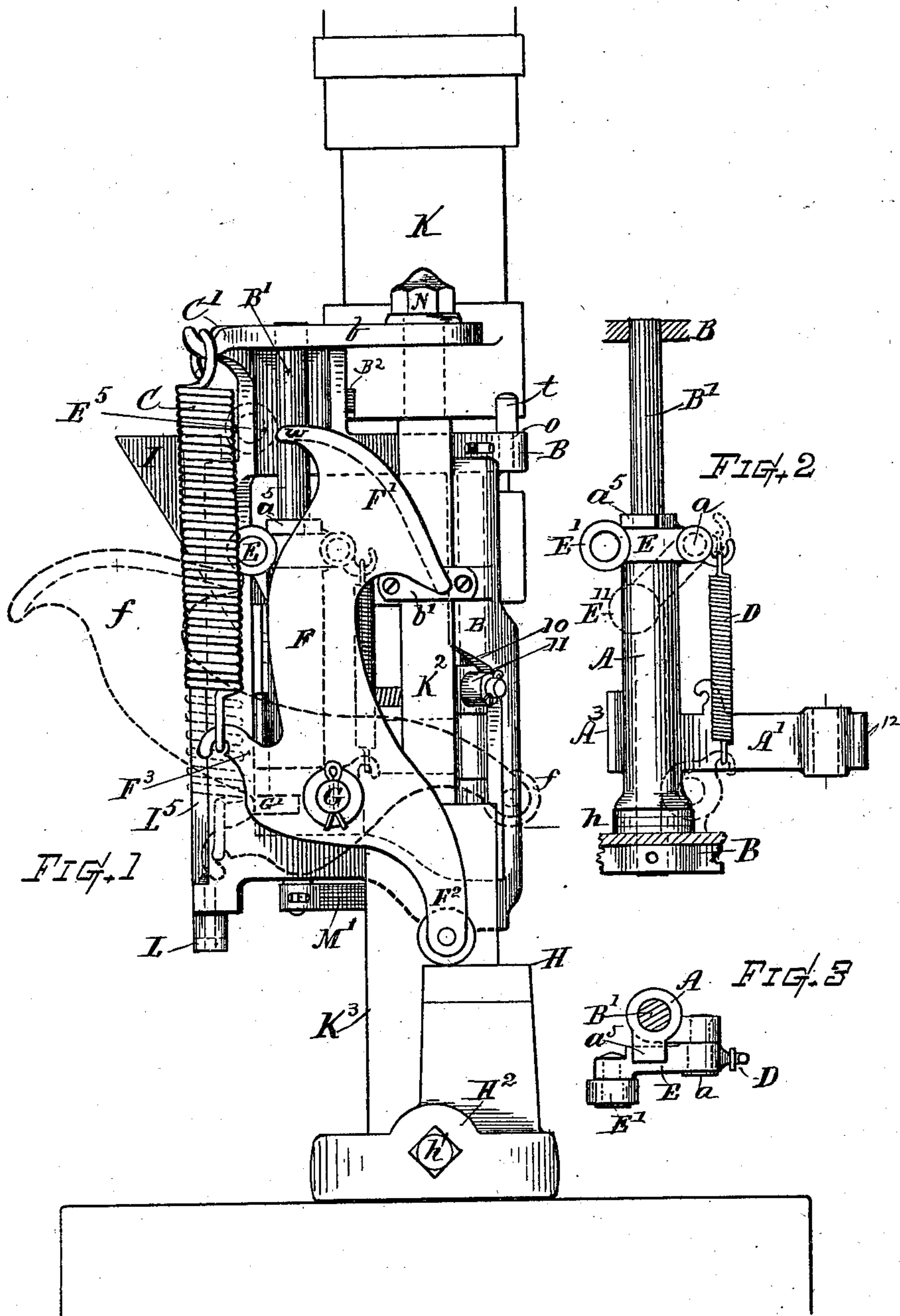
F. O. WOODLAND.

CROWN PLACER MECHANISM FOR BOTTLE FILLING AND STOPPERING MACHINES.

(Application filed June 15, 1900.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES.

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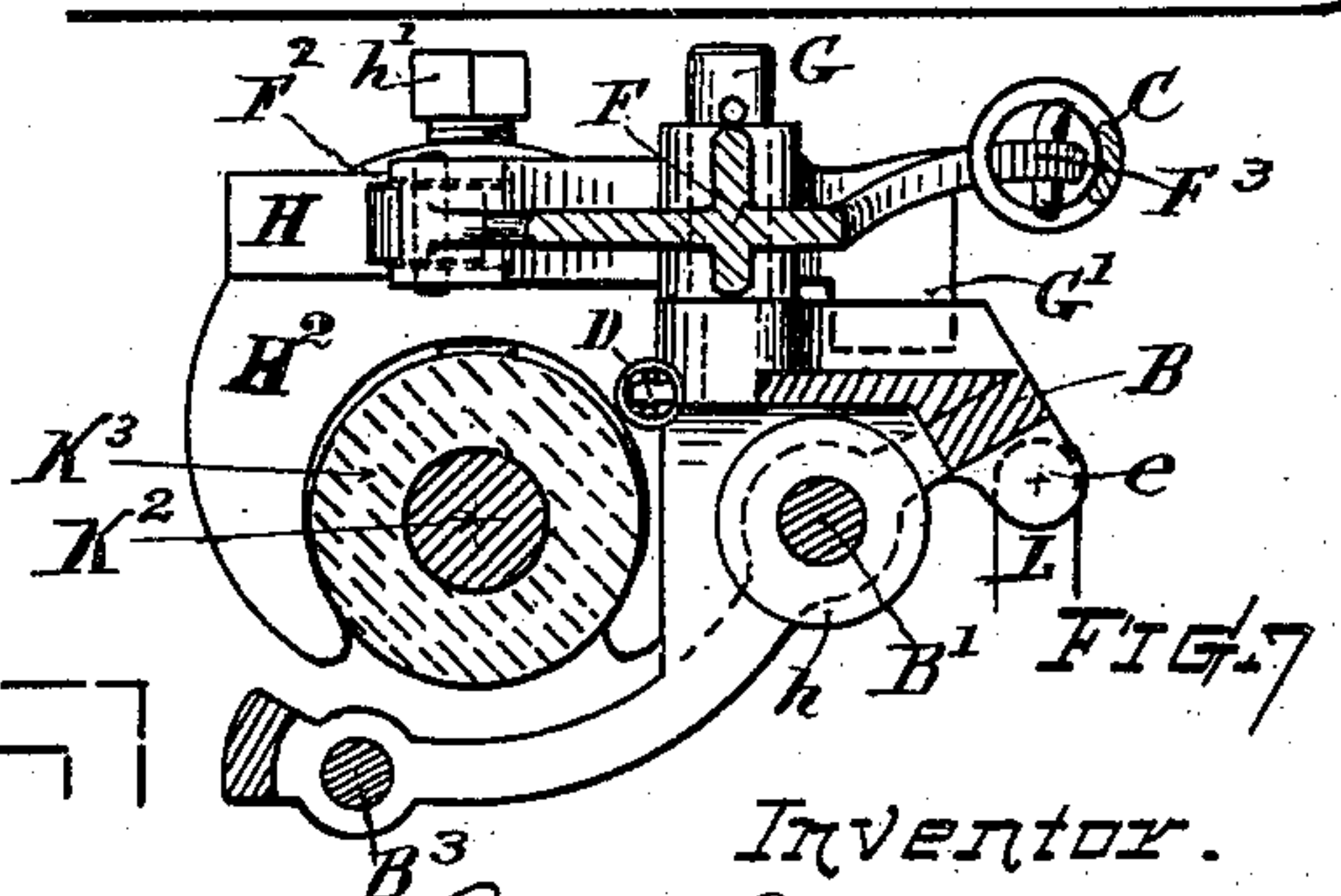
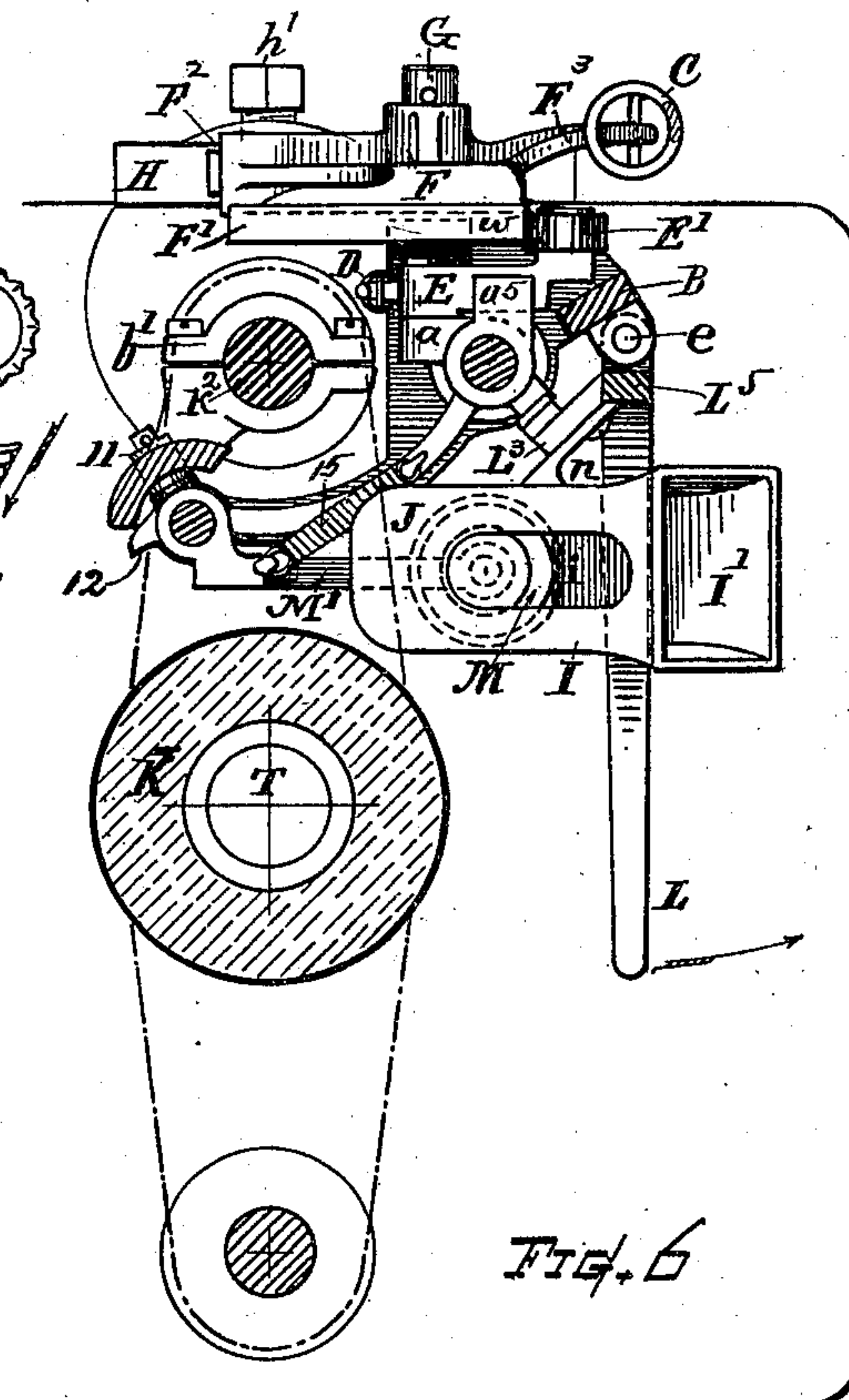
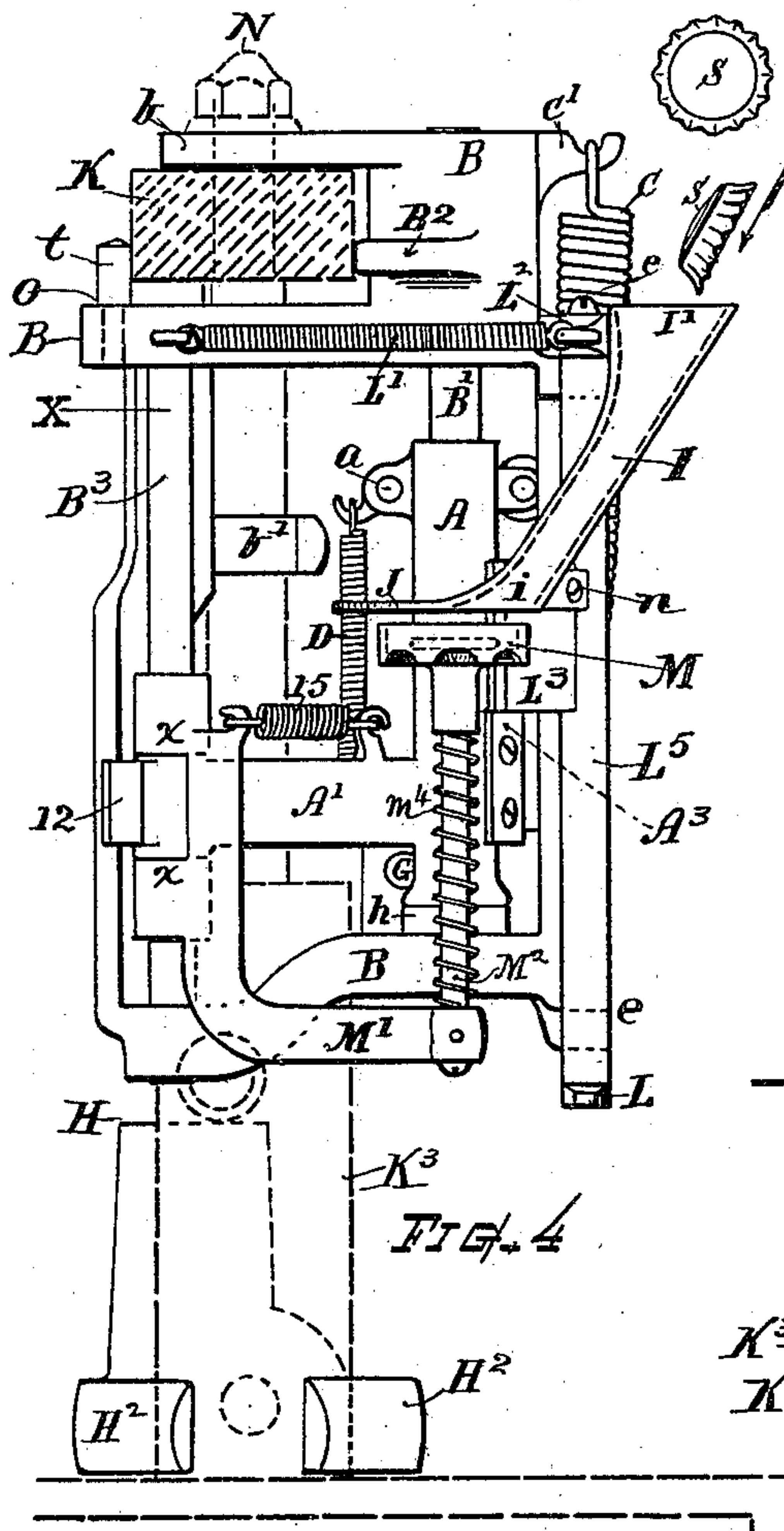
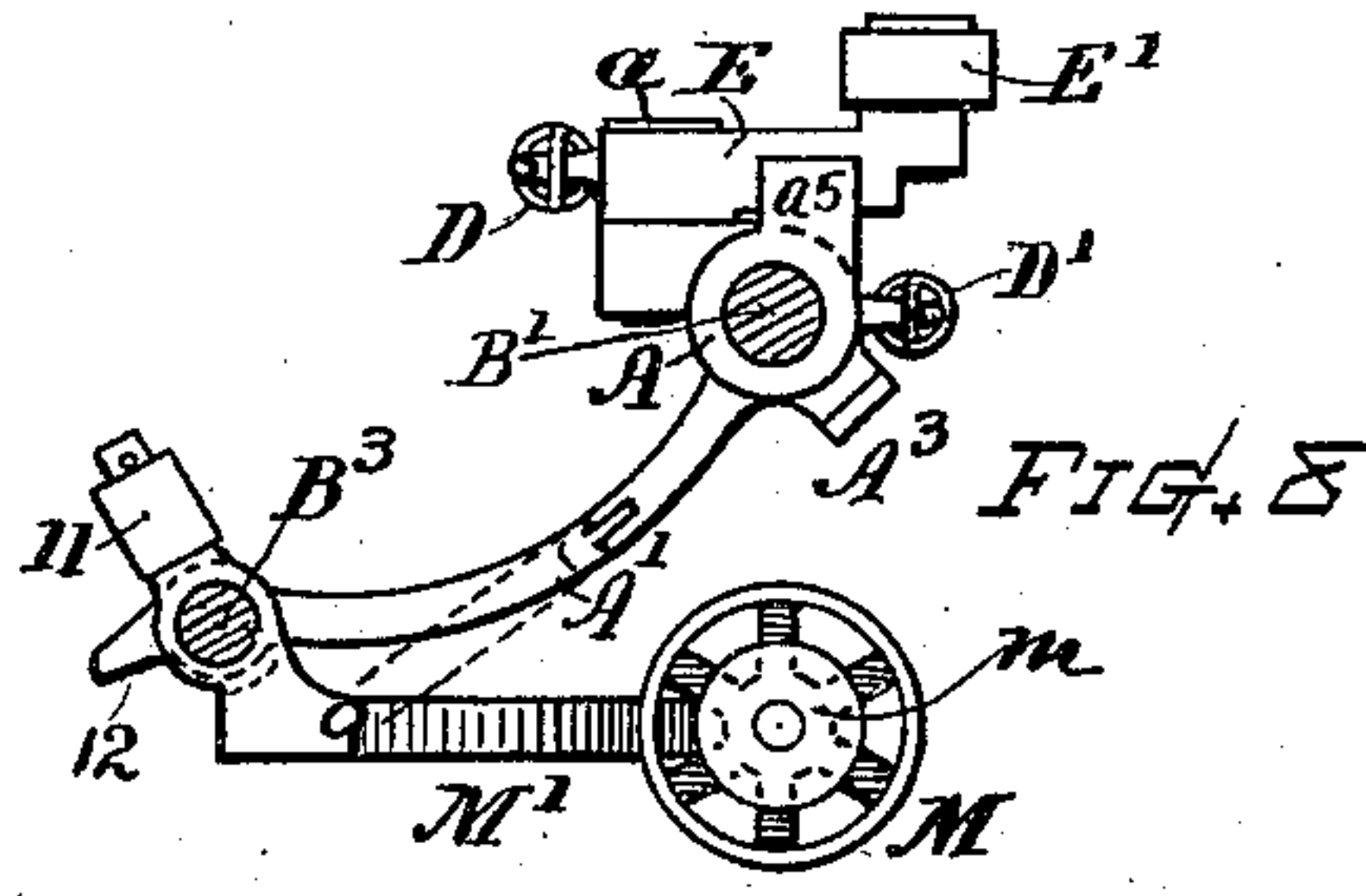
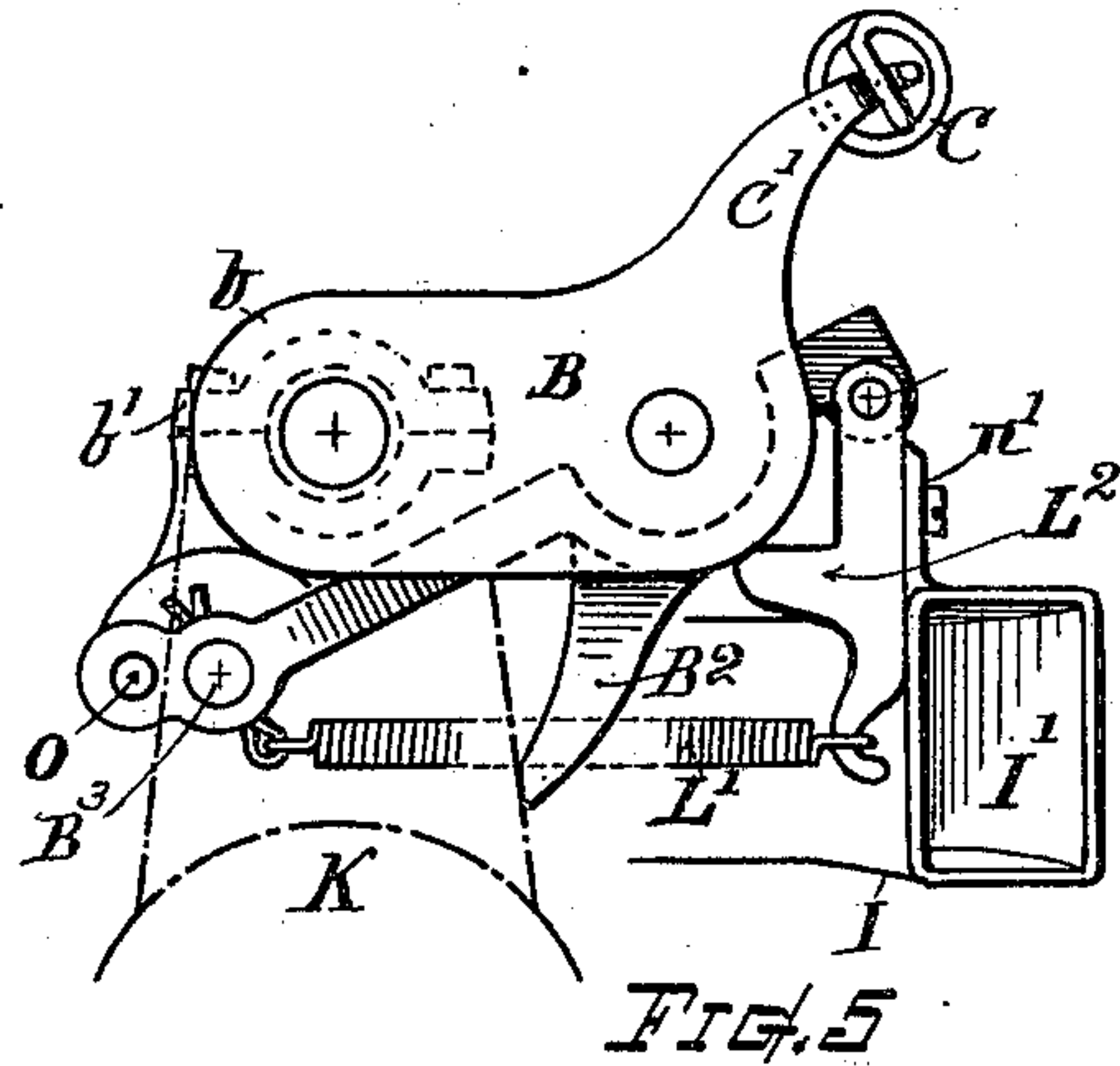
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(No Model.)

3 Sheets—Sheet 2.



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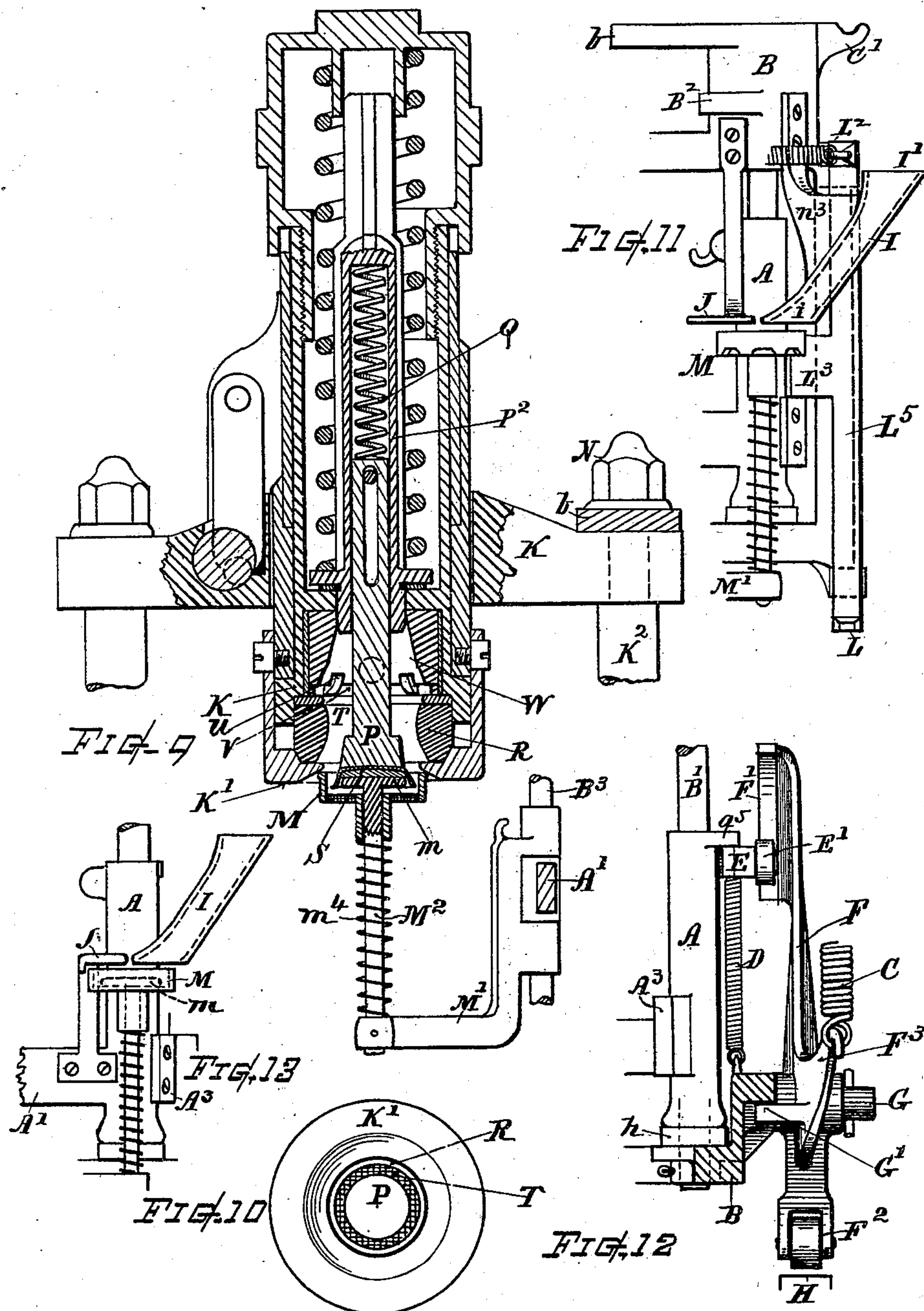
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(Application filed June 15, 1900.)

(No Model.)

3 Sheets—Sheet 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

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CROWN-PLACER MECHANISM FOR BOTTLE FILLING AND STOPPERING MACHINES.

SPECIFICATION forming part of Letters Patent No. 684,026, dated October 8, 1901.

Application filed June 15, 1900. Serial No. 20,404. (No model.)

To all whom it may concern:

Be it known that I, FRANK O. WOODLAND, a subject of the King of Sweden and Norway, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Crown-Placer Mechanism for Bottle Filling and Stoppering Machines, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

My present invention relates to certain novel combinations and improvements applicable to crown-placing or feeding mechanism of that class wherein an elevating crown-carrier is employed by which the bottle-stopper crowns are upwardly inserted within the throatway of the crown-setting head of a bottle-stoppering machine such as employed for bottling aerated beverages or liquids under pressure.

The prime objects of my invention are to render the mechanism compact in structure, light and easy for operation, and convenient for attendance and adjustment.

The minor objects and improvements or novel features comprised in my present invention are specifically set forth and explained in the following detailed description of mechanism embodying the same, the particular subject-matter claimed being hereinafter definitely specified.

In the accompanying drawings, Figure 1 represents a rear elevation view of a crown-placer mechanism embodying my invention. Fig. 2 is a separate rear view of the reciprocating elevator member, its guide, and lifter devices. Fig. 3 is a top end view of the same. Fig. 4 represents a front view of the crown-placer mechanism, its relative position upon and connection with the crown-setting machine being indicated thereon. Fig. 5 is a detail plan view showing the top end of the frame and adjacent parts. Fig. 6 represents a plan view, partly in horizontal section, at line X on Fig. 4 near the upper part of the frame. Fig. 7 is a detail horizontal section showing the lower part of the frame and the operator-lever. Fig. 8 is a detail plan view

of the crown-carrier connecting-arms and lifter devices. Fig. 9 is a vertical central section through the head of a filling and stoppering machine and crown-carrier appliances; illustrating the combined means for holding the crowns horizontal while entering and passing the gasket-ring and within the throatway. Fig. 10 is a bottom view of the end collar and throatway. Fig. 11 illustrates a modification in the structure of the feedway-conduit and the carrier-guard. Fig. 12 is a sectional view showing the elevator and operator-lever in an edgewise elevation view, and Fig. 13 shows the guard fixed on the elevator.

In the crown-placer mechanism, as shown in the drawings, some of the parts are constructed and arranged to operate as described in my prior Letters Patent No. 665,623, and such parts will be understood without extended description thereof herein, the present description serving to point out and explain the new invention and improved features combined therewith.

Referring to the drawings, the part marked A represents the elevator-slide or upwardly and downwardly moving member, by which the crown-carrier is raised and depressed, and B denotes the frame for supporting the operating parts and connecting the mechanism with the upwardly and downwardly movable crown-setting head K upon the bottle-stoppering machine. This frame B is best made as a single casting of the general form and arrangement shown, having connected upper and lower portions for supporting the ends of the upright guide-rods B' B³, and for its attachment to the stoppering-machine head there is provided an ear or bracket b, that rests upon and is clamped to the wing portion of the head K by the nut N or other efficient fastening device, and also a bearing or clasp b', that embraces the head-supporting rod K² and is clamped thereto at a position somewhat below said head or its wing portion. The ear b and clasp b' axially center on the rod K² and afford an upper support by said ear and a lower support by said embracing clasp, whereby the crown-placer mechanism is secured and held with lateral firmness so that the working parts of the crown-placer are maintained in axially parallel alinement

or correct relation to the axis of the stoppering-machine head or its throatway, into which the crown-carrier is to properly enter. The frame B is also provided at its top with a projection C', having a hooked end for sustaining one end of the mainspring C, which exerts the actuating power for placement of the crowns.

According to my present invention the elevator A is constructed as a tubular body mounted to slide upon a stationary guide or rod B', supported in the frame B. Said elevator-slide is provided with the rigid laterally-projecting arm A', that connects with and operates the crown-carrier and has the catch-lug A³ thereon that coacts with the lug or detent of the let-off or trip lever. Upon the elevator A, I arrange a lifter or engaging device, which preferably consists of a short arm E, pivoted at *a* to an ear formed on the elevator-slide body and having at its swinging end a stud and roll E'. A stop-shoulder or projection *a*⁵ is also formed on said body above the arm E and against which the upward swing of the arm is arrested. Said arm is free to swing downward, but is normally held against the stop *a*⁵ by a suitable spring, as D, one end of which is connected with a hook on the hub of the arm and its other end connected with the frame or arranged in other suitable manner for giving a yielding resilient action to said lifter-arm and its roller-stud.

The spring D serves for depressing the elevator-slide A, as well as for controlling the arm E, or, if preferred, two separate springs can be employed, one for the lifter-arm and another for depressing the member A, which latter can be located as at D', Fig. 8, or the member A and carrier can be made to drop by gravity alone or without the aid of any depressing-spring. The foot of the elevator-slide is stepped upon an annular cushioning-washer *h*, of leather or other suitable semi-elastic material.

F indicates a swinging lever or operator member pivotally fulcrumed upon the frame B by the axis pin or stud G and comprising, as shown, an upper arm provided with a cam flange or surface F', that engages the lifter-stud E', connected with the elevator slide or member A, and a lower arm provided with a contact-foot or bearing-roller F², that coacts with the stationary abutment-surface H upon the stand or foot block H², which is attached to the horn K³ of the crown-setting machine. The lever F is also provided with an arm F³, to which one end of the mainspring C is connected, the other end of which spring is connected to the projection C' on the frame. The mainspring C is strained to act by contractile force to move the lever F in opposition to the abutment H, and there is provided a stop G' or means for arresting the movement of the lever F and spring C at the required limit for their action. The cam surface or flange F' is preferably formed with a retreating or varied curvature or to give a shorter degree of throw toward its latter end

w, so that the cam-power is concentrated or increased as the crown-carrier approaches the dies W and as the spring C contracts toward its limit of exhaustion. This renders the movement of crown-carrier relatively slower, but more powerful, while within the throatway; but it performs the early part of its movement where there is no resistance with ease and despatch and attains the effective operation with a mainspring of less strength than would otherwise be required. The roller-stud or engaging detent E', being arranged upon the short swinging arm pivotally attached to the elevator member A, is adapted, by means of the rigid stop above it and its yielding spring at the other side, to positively engage the cam-flange F' and effect the upward lifting of the elevator-slide or carrier-actuating member A when the lever moves in one direction; but by yielding the roll-stud E' passes under said flange when it moves in the opposite direction, thus permitting the lever to recover its prime position.

A very light tension depressing-spring D is sufficient for the reciprocating elevator A and its lifter, and a single spring can perform the double function of controlling the arm E and depressing the elevator and crown-carrier devices. The gravity of the parts acts in the same direction with said spring and will effect the drop motion.

The construction and arrangement of the trip or let-off lever L, its return-spring L', arm and stop-finger L², and the latch-lug L³ are substantially the same as disclosed in my prior Letters Patent, these parts being united by an upright bar L⁵, hinged to the supporting-frame, as at *e e'*, and forming a trip or let-off device that can swing laterally outward when a capped bottle is removed from beneath the capping-on head and contacts with the lever L.

The crown-carrier devices M, comprising the swinging arm M', upright supporter or finger-rod M², tip-end plate *m*, spring *m*⁴, hinging connections *x* on the guide-rod B³, controlling-cam 10, roller-stud 11, and return-spring 15, are severally constructed and arranged substantially as described in my prior Letters Patent.

In my present invention I provide, in combination with the crown-carrier, a feedway conduit or mouthpiece I and a covering-guard J for conveniencing the handling of the crowns. Said mouthpiece I (see Figs. 4, 5, and 6) is formed with an internal channel adapted for the edgewise passage of crowns singly and is arranged in inclined position, supported in the present instance upon the swinging trip-lever frame, its mouth opening at I', at or near the top thereof, and its lower end *i* disposed at a position for sliding a crown diagonally into the crown-carrier cup and depositing it in proper position over the supporting-plate *m* of the inserting finger or rod M². The upper side or plate portion of the

delivery end of the inclined mouthpiece is extended horizontally over and beyond the rim of the crown-holder, at a slight distance above the same, forming an independent over-lying guard J, by means of which all liability of displacing the crown at the quick start of the crown-carrier is prevented. An opening in the upper side of the mouthpiece enables the attendant to observe the position of the crown therein. The upper part of the mouthpiece or feedway-conduit I may be attached for support to the upper portion or spring-connecting arm L^2 of the let-off mechanism, as best shown at n' , Fig. 5, while the lower part of said mouthpiece can be attached to the lug L^3 , as indicated at n in Figs. 4 and 6, or to the upright bar L^5 , on which said lug is formed. When thus supported, the mouthpiece or feed-conduit I and guard J can swing away from their normal position when the trip-lever L is swung outward for starting the crown-placing mechanism.

Instead of attaching the mouthpiece I to the swinging trip-bar L^5 for its support it is obvious that said mouthpiece can be supported on the frame B, if desired, and I have illustrated such an arrangement in Fig. 11, in which instance the top I' of the mouthpiece is below the level of the spring-connecting arm and the attaching-bracket n^3 is disposed in a manner that permits the trip devices to swing outward while the mouthpiece remains stationary.

If desired in any instance, the guard J can be made and used in a separate piece from the mouthpiece or conduit I. An illustration of such construction is shown in Fig. 11, wherein the guard is shown as attached to the stationary frame; but I prefer to have the guard attached to or retractable by a movable part of the mechanism, as when connected with the trip-lever devices or, as shown in Fig. 13, attached to the elevator A to move upward therewith as the carrier-cup starts. In this case the guard can be set closer to the top of the carrier-cup.

The lateral swing of the crown-carrier avoids contact of the guard J and carrier-top as the latter moves toward the head K when discharged.

With a mouthpiece substantially such as described the care and labor of loading the crown-carrier are reduced to a minimum. It is simply necessary to drop the crown S edge-wise into the mouth, as indicated in Fig. 4. It then naturally falls into proper place. Another advantage is that the hand of the attendant when depositing the crown is at a position where it is not liable to injury by broken glass from a bottle bursting during the process of filling—an event which sometimes occurs.

For insuring proper assemblage of the crown-placing attachment upon the bottle filling and stoppering machine I provide the supporting-frame B with a projecting horn or tongue B^2 , adapted to serve as a stop or guide

in the adjustment of the crown-placer attachment in relation to the crown-setting machine-head. Thus when the frame is set with the clasp b' , ear b , and nut N in position the placement of the end of the horn B^2 against the side of the machine-head K brings the crown-placer mechanism into proper position, so that the crown-carrier M will swing into correct alinement with the throat-opening T. Hence an unskilled workman is enabled to readily assemble and adjust the crown-placer mechanism upon the ordinary crown-bottle-stoppering machine whereon this crown-placing mechanism is designed for use.

In the upper portion of the frame B, I provide a hole o , the position of which coincides when the adjustment is correct with the opposite side of the machine-head and into which after the adjustment is effected a stud or key t can be inserted, which stud stands adjacent to the side of the headpiece K, (see Figs. 1 and 4,) and in opposing conjunction with the horn B^2 retains the frame B from being moved laterally or becoming accidentally displaced from its proper position.

In the crown-setting-machine head the spring-pressed main plunger, which forces the crowns upon the heads of the bottles, is provided with a drop-plunger P, that slides therein and is depressed by a light tension-spring Q, disposed in the bore above it. In my improvement this drop-plunger P is constructed so that its lower end face is normally disposed adjacent to the collar-face K' or mouth of the throatway, at which level said plunger-face coacts with the tip-end plate m of the crown-carrier for embracing or contact with the disk of the stopper-crown S as the holder-rim is stopped at the face K' of the collar. The crown-disk being thus embraced between the end of the drop-plunger P and the tip-end plate m , while at a position at or below the level of the gasket-ring R, the crown S is kept positively horizontal as it is carried up through the gasket-ring and throatway into the die W, thereby preventing any liability of the crowns tilting or becoming diagonally displaced while going through the gasket-opening, even though the gasket may be ragged, and also insuring the square setting of the crowns within the capping-on die W, and hence their more perfect closure upon the bottles.

In the operation the attendant drops the crown bottle-stoppers S into the mouthpiece I, which loads the carrier or holder M. Then, the head K, with the frame B, being depressed, the roller-arm F^2 of the lever F impinging on the abutment H causes said lever to assume the position indicated by dotted lines f , thus straining the mainspring C by its arm F^3 and swinging its cam-flange F' over the lifter-roll stud E' , the arm E yielding, as per dotted lines E'' , Fig. 2, while the flange passes over it, but immediately rising in front of the cam-surface. By reason of the trip-clutch

lugs L^3 and A^3 locking down the member A, on which said lifter is mounted, the roll-stud then prevents the immediate reaction of the lever, while the machine-head K is elevated to its primary position. The mechanism is now in set condition, ready for discharge. By swinging the trip-lever L in usual manner in the direction indicated by the arrow on Fig. 6 the lug L^3 is thrown off from the lug A^3 , releasing the reciprocating elevator slide or member A and parts connected therewith. The mainspring C then contracting moves the lever F and forces the cam-flange F' beneath the lifter-roll stud E' , causing instant elevation of the member A and crown-carrier devices, which are connected therewith. When the crown-carrier arm M' is thus elevated, its roll-stud 11 and the cam-surface 10 cause the arm to swing laterally, bringing the crown-carrier into alinement with the throatway T in the stoppering-machine head K, into which the crown, supported on the tip end plate m , is inserted by the upward movement of the crown-carrier, the action of the crown-carrier arm being similar to that described in my prior application. When the lever F has made its full forward movement, the cam or flange F' has raised the lifter E and member A to its full limit, and the roll-stud E' is there released by the said flange. (See dotted lines E^5 , Fig. 1.) Then the elevator and parts will drop to their primary position by gravity or aided by the force of the spring D. At the same time further movement of the lever F by the spring C is arrested by the contact of the stop device at G' . As the crown-holder M enters the throatway T the crown S is met at the entrance by the yielding drop-plunger P, and the disk of said crown is embraced between the plate m and plunger-face and is thereby maintained horizontal or prevented from becoming tilted as it is carried upward through the gasket and placed squarely in the capping-on die W, while the holder-rim remains outside stopped against the collar-face K' . The act of again depressing the machine-head for capping the crown upon a bottle effects the resetting of the operator-lever and mainspring ready for another discharge, and the act of removing the bottle against the trip-lever puts the crown-placer mechanism into operation for repeating the movements, as above described.

The crown-placer mechanism receives its store of energy in the spring C while the bottle-capping head is doing its work by the downward movement thereof, and the crown-carrier is discharged for placing the crown within the capping-head while said capping-head is idle and at elevated position. Hence the lever F can perform its discharge movement without interfering with a bottle or striking the abutment H with its foot roll or arm F^2 .

It may be noticed that when the elevator and crown-carrier devices reach the limit of

elevation the mainspring and operator-lever let go or cease to act upon them, leaving the released devices free to descend without influence from the mainspring tension. A very light depressing influence is therefore all sufficient for returning the elevator and carrier to primal position. Furthermore, the setting of the mainspring C is effected while only said spring is operatively coupled to the lever, the other parts being then at rest. This method and arrangement while utilizing the full power of the springs renders the machine very light running and easy of operation, thus attaining quite a saving in power.

Having fully set forth my improvements as embodied in a practical machine, what I claim as of my invention, and desire to secure by Letters Patent, is—

1. In a crown-placing mechanism for the purposes specified, an operator-lever pivotally fulcrumed upon the frame and provided with a cam, flange or surface, and a contact-foot, a main actuating-spring connected with said lever, a reciprocating elevator member, the crown-carrier operatively united therewith, a lift device mounted on said reciprocating member for engagement with the cam-flange on said lever, means for locking and releasing said elevator member, and means for swinging said lever in opposition to the force of said mainspring, by the downward movement of the mechanism.

2. In a crown-placer mechanism for the purpose specified, the combination with the operator-lever having a cam, flange or surface, the actuating-mainspring, and the elevator-slide having an arm connected for raising and depressing the crown-carrier devices; of a lifter for connection between said elevator-slide and operator-lever, consisting of a swinging arm pivotally attached to said elevator and carrying a roll-stud in a plane coincident with said cam-flange surface, a stop-lug fixed on said elevator-slide, and a spring connected with said lifter-arm for normally raising it against said stop-lug, but affording downward-yielding release, substantially as and for the purposes set forth.

3. In a crown-placer mechanism for the purpose specified, the combination with the supporting-frame attachable to a bottle-stoppering-machine head, and crown-carrier devices adapted for inserting crown bottle-stoppers into said head; of an elevator-slide having an arm connected for raising and depressing said crown-carrier devices, a guide for said elevator fixed in the frame, a lifter mounted on said elevator-slide, an operator-lever fulcrumed on the frame and provided with a cam, flange or surface that engages said lifter for effecting upward action of the elevator, an actuating-spring connected with said lever, a resistance means for rocking said lever for straining said spring, and locking-catches and throw-off devices for retaining and releasing said elevator, substantially as set forth.

4. In a crown-placer mechanism for the purpose specified, the supporting-frame having a projection, the operator-lever pivotally fulcrumed on said frame and comprising a power-receiving arm, an arm furnished with a cam, flange or surface for operating the crown-carrier-elevator mechanism, a spring-connecting arm, and a stop for limiting the forward movement of said lever; in combination, with the contractile mainspring strained between and having its ends respectively connected to the arm of said lever and said projection on the frame, and means for moving said lever in opposition to said spring, substantially as set forth.

5. In a crown-placer mechanism for the purpose specified, the combination, of a crown-carrier, a traversing carrier arm or support therefor, an elevator-slide connected for raising said carrier, a stationary guide for said elevator-slide, an operating means that moves said elevator in upward direction and then releases therefrom permitting the return of the slide and carrier to primary position, uninfluenced by the motor tension.

6. In a crown-placer mechanism for the purpose specified, the combination, with the crown-carrier, supporting and guiding devices therefor, an elevator-slide connected for raising said carrier, and a guide for said elevator-slide; of a motor-power and elevator actuating means normally unconnected with, but adapted for operating said elevator-slide in upward direction and then releasing therefrom, and a light tension-depressing spring that returns said elevator-slide to its primary position.

7. The combination with a carrier adapted to have lateral and upward movements for conveying the bottle stopper or crown up the throatway to the capping-on die in a bottle-stoppering machine, means for guiding and directing said carrier, a carrier-elevating slide and lifter or engaging detent for said slide; of an actuating member provided with a flange or cam surface that is relatively inclined in respect to its direction of movement, and adapted for passing transversely beneath said lifter-detent and engaging therewith to impart upward movement to the slide and carrier mechanism.

8. In a mechanism for the purpose specified, the combination, with a bottling-machine head having a filling-chamber, throat-packing gasket, and crown-setting die, of a carrier for inserting crown-stoppers up the throatway to said die, means for moving said carrier laterally toward and from the throatway-axis, a vertically-elevating slide connected therewith, an independent rocking lever with engaging devices for lifting said slide, a power-spring acting on said lever to impart elevating movement to the slide and crown-carrier, means for independently setting said spring and lever by the bottle-capping movement, and a let-off trip dischargeable by contact with the bottle.

9. In a crown-placer mechanism, the combination with a crown-carrier, means for elevating the said carrier into the throatway to the crown-setting die; of a spring-actuated lever for operating said carrier-elevating means, said lever provided with a cam, flange or surface formed with a varied curvature adapted for increasing the power and decreasing the speed of the carrier movement, at the latter part of said cam-surface, and a spring connected with said lever for imparting the operative motion to the same.

10. In a crown-placer mechanism for the purpose specified, the combination with the crown-carrier, of a plate member unconnected with and extending over and above the crown-holder, forming an independent overlying guard for said crown-carrier, adapted for confining the crown within the carrier or holder while at its starting position.

11. In a crown-placer mechanism for the purpose specified, the combination with the laterally-swinging vertically-movable crown-carrier having a crown-support, of a guard or plate extending over said crown-support when at its normal idle position, said guard connected with and retractable by a movable part of the mechanism, substantially as set forth.

12. In a crown-placer mechanism for the purpose specified, the combination, with the crown-carrier having a support or crown-holding cup, of the open-topped inclined mouthpiece disposed above said cup and adapted for receiving and directing the crowns therein when said carrier is at normal idle position, and means for supporting said mouthpiece.

13. In a crown-placer mechanism for the purpose specified, the combination with the crown-carrier having the crown-supporter or crown-holding cup, of a feedway conduit or mouthpiece mounted upon the swinging trip-lever support, said mouthpiece adapted for delivery of a crown into said crown-holder when at its normal idle position, and for retraction by and with the trip-lever.

14. In a crown-placer mechanism for the purpose specified, the combination, with the laterally-swinging crown-carrier having a crown-support and circumferential lip or guard-rim, and the laterally-swinging trip-frame comprising the upright hinging-bar with the catch-lug, trip-lever and spring-connecting arm, and a return-spring therefor; of an inclined feedway or loading-guide, mounted on said trip-frame and presenting a mouth-opening at the top thereof, its lower end in combined relation for sliding a crown into proper position within the crown-carrier rim, and having the upper plate portion at its delivery end extended horizontally over and across the said carrier-rim, substantially as set forth.

15. In a crown-placing mechanism for the purpose specified, the combination with the supporting-frame adapted for attachment to

the bottle-stoppering-machine head, and having its attaching means disposed axially coincident with the head-supporting rod; of a horn or projection formed on said frame adapted for resting against the side of the machine-head when the crown-placer mechanism is at proper position for the crown-carrier to swing into central alinement with the throat-opening, substantially as set forth.

16. In combination with the bottle-stoppering-machine head, and the crown-carrier and carrier-actuating devices; a supporting-frame provided with a projecting horn B² formed upon the side of said frame for contact with the machine-head, and a hole O formed in said frame for the reception of a pin or key adjacent to the opposite side of the machine-head, substantially as set forth.

17. In mechanism for feeding and affixing crown bottle-stoppers, as described; the combination with an upwardly-insertible carrier having a top or end plate whereon the stopper or crown is introduced through the collar-opening and throatway to the crown-affixing die; of the yieldable drop-plunger when disposed and adapted as set forth, for contact of its end face with the end plate or crown upon said carrier, when at or adjacent to the collar-opening below the gasket, and coacting therewith to prevent sidewise tilting of the crown while passing through the gasket and with the throatway.

18. In mechanism for the purpose set forth, the foot-block H² comprising a crescent-shaped body having inwardly-curved embracing arms, and provided with an abutment-face or bearing-seat for sustaining the lever-foot, and a set-screw threaded into said body; in combination, with the operator-lever, crown-placing mechanism actuated thereby, and the upwardly-projecting horn of the crown-setting-machine frame, substantially as set forth.

19. The combination with the reciprocating bottle-stoppering-machine head supported by upright guide-rods, and a crown-placing mechanism provided with means for inserting a crown bottle-stopper into the throatway of said head; of means for attaching said crown-placing mechanism to the stoppering-machine, consisting of a supporting ear or bracket that rests upon and is clamped to the wing of the machine-head, and a clasp that embraces and is clamped upon the head-supporting guide-rod below said head; whereby the crown-placer mechanism is retained in axially parallel alinement with the throatway-axis.

Witness my hand this 12th day of June, 1900.

FRANK O. WOODLAND.

Witnesses:

CHAS. H. BURLEIGH,
ELLA P. BLENUS.