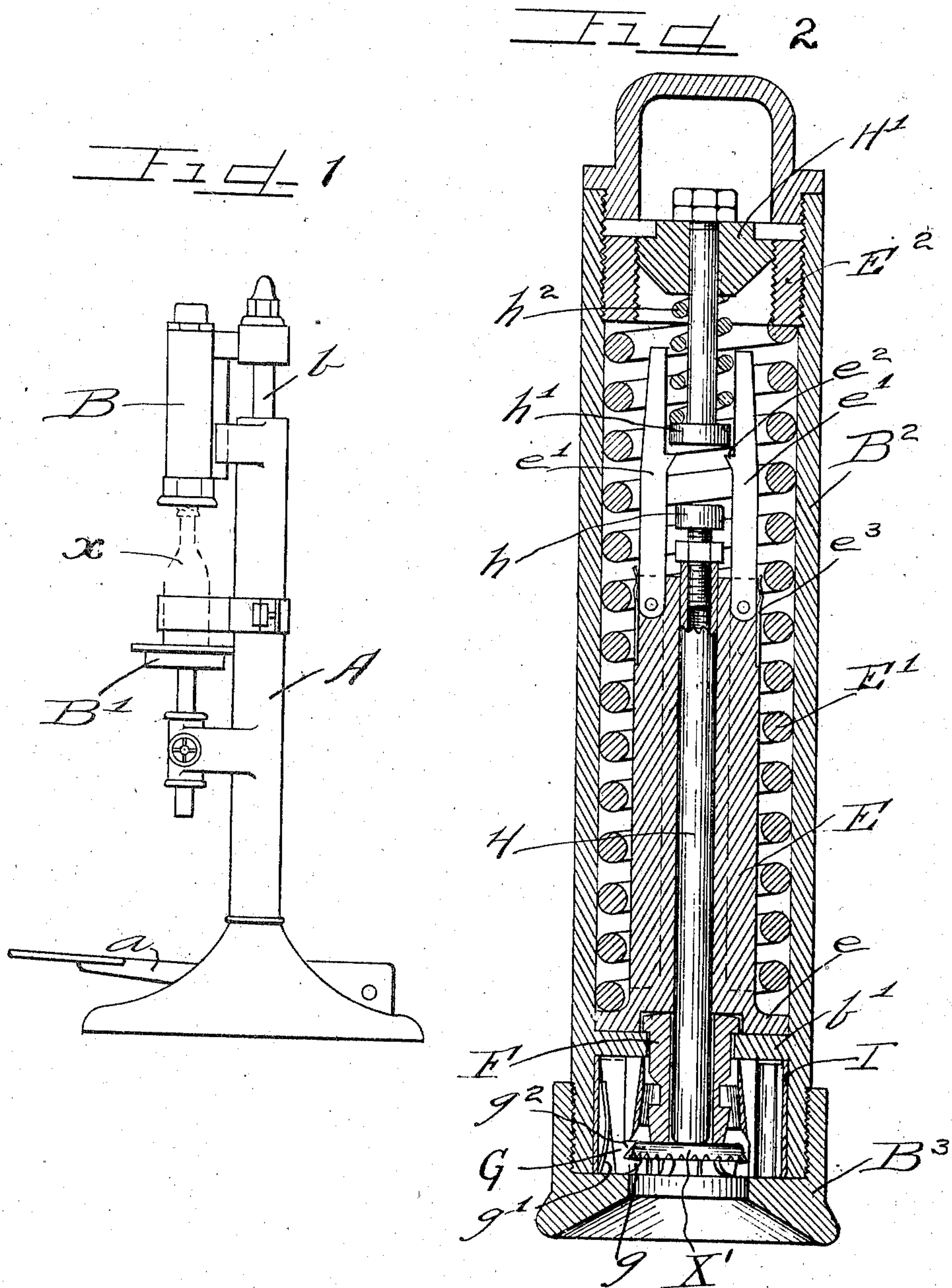


967,614.

P. CONRAD.
MACHINE FOR SEALING BOTTLES.
APPLICATION FILED SEPT. 22, 1908.

Patented Aug. 16, 1910.

3 SHEETS—SHEET 1.



WITNESSES
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967,614.

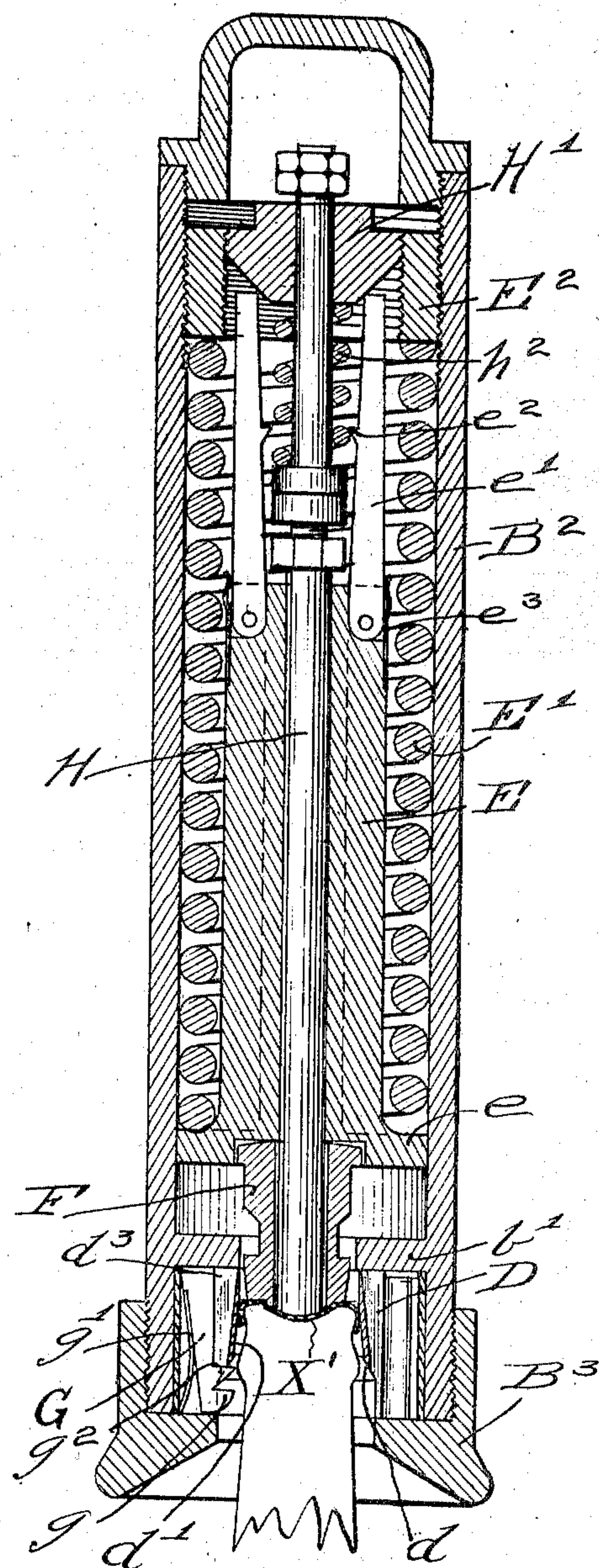
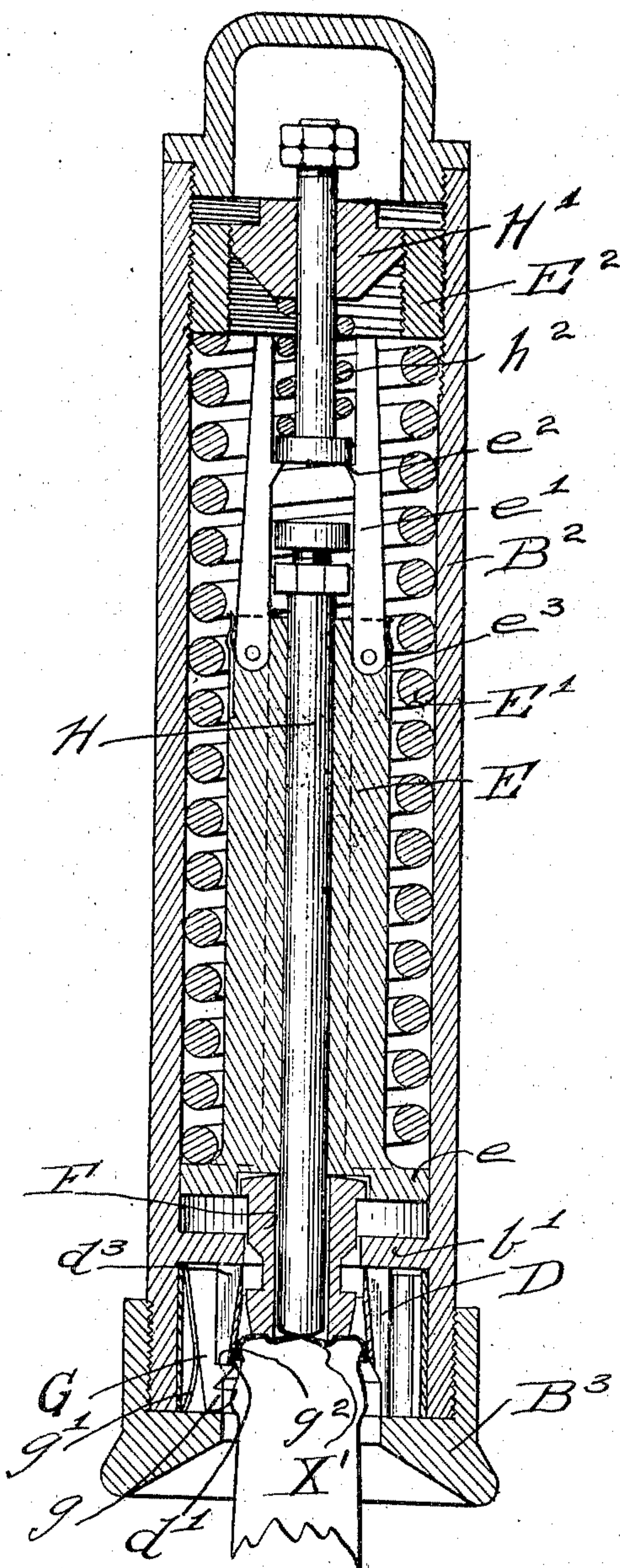
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3 SHEETS—SHEET 2.

Fig. 3

Fig. 4



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3 SHEETS—SHEET 3.

Fig 5

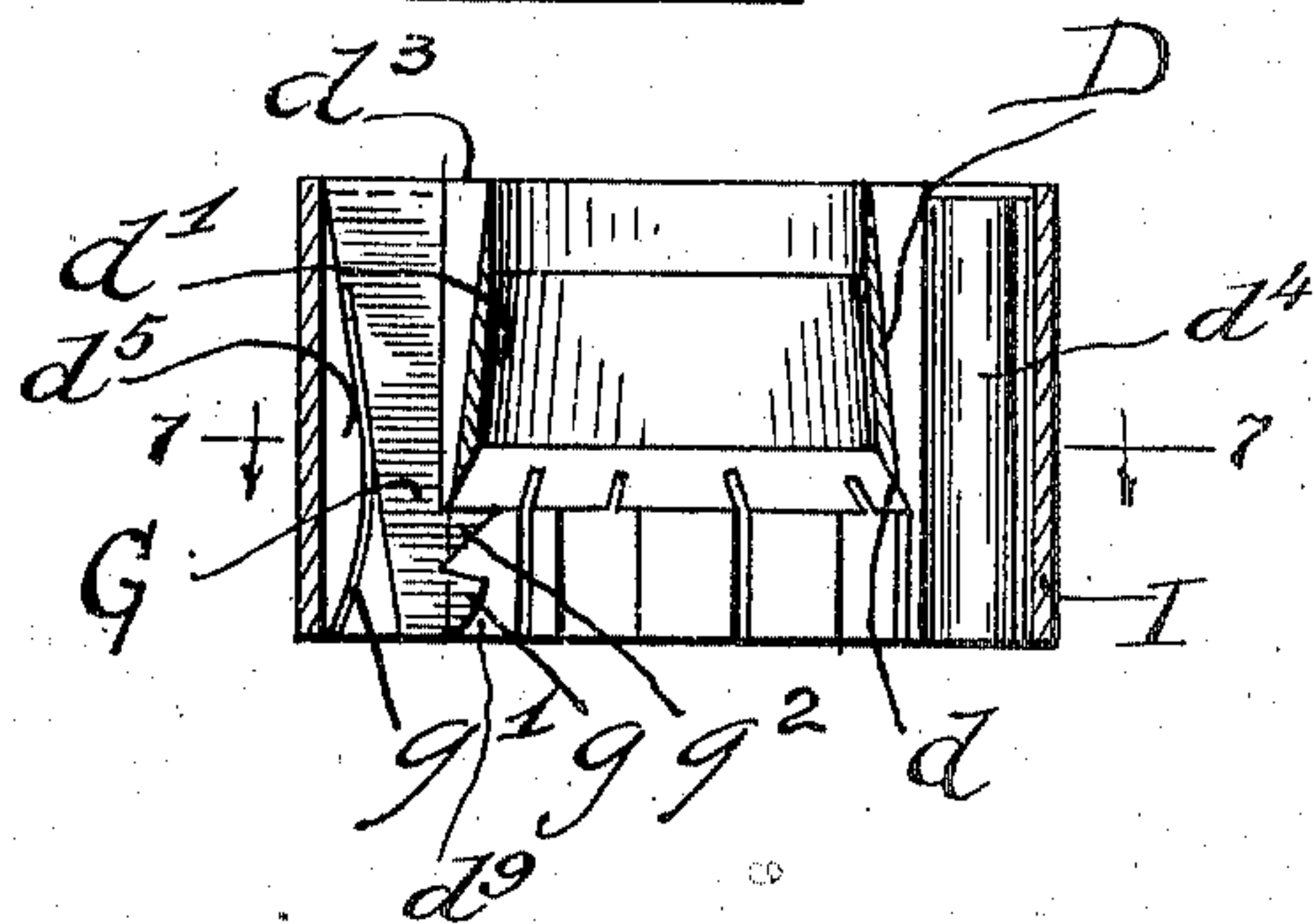


Fig 6

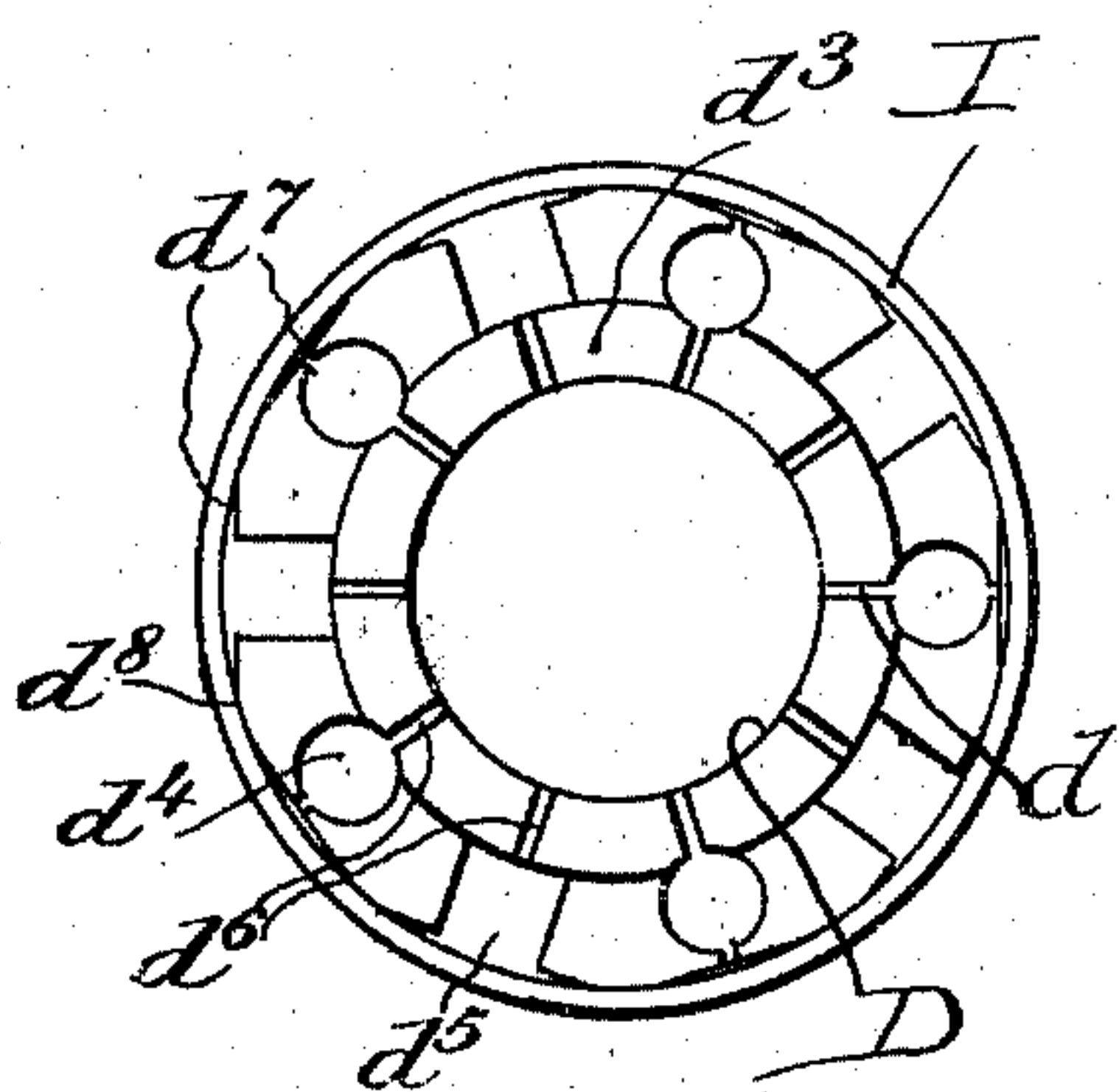


Fig 7

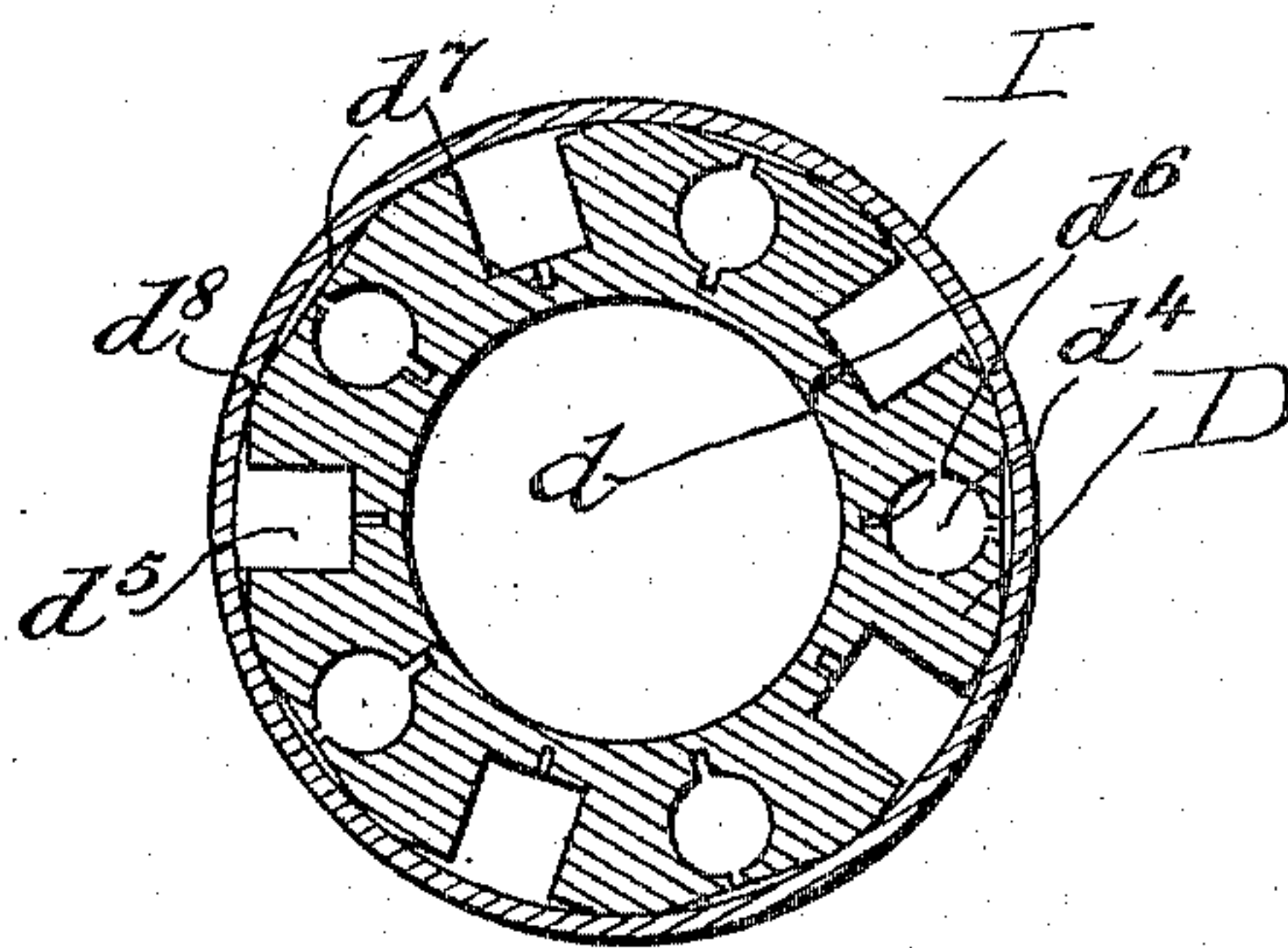
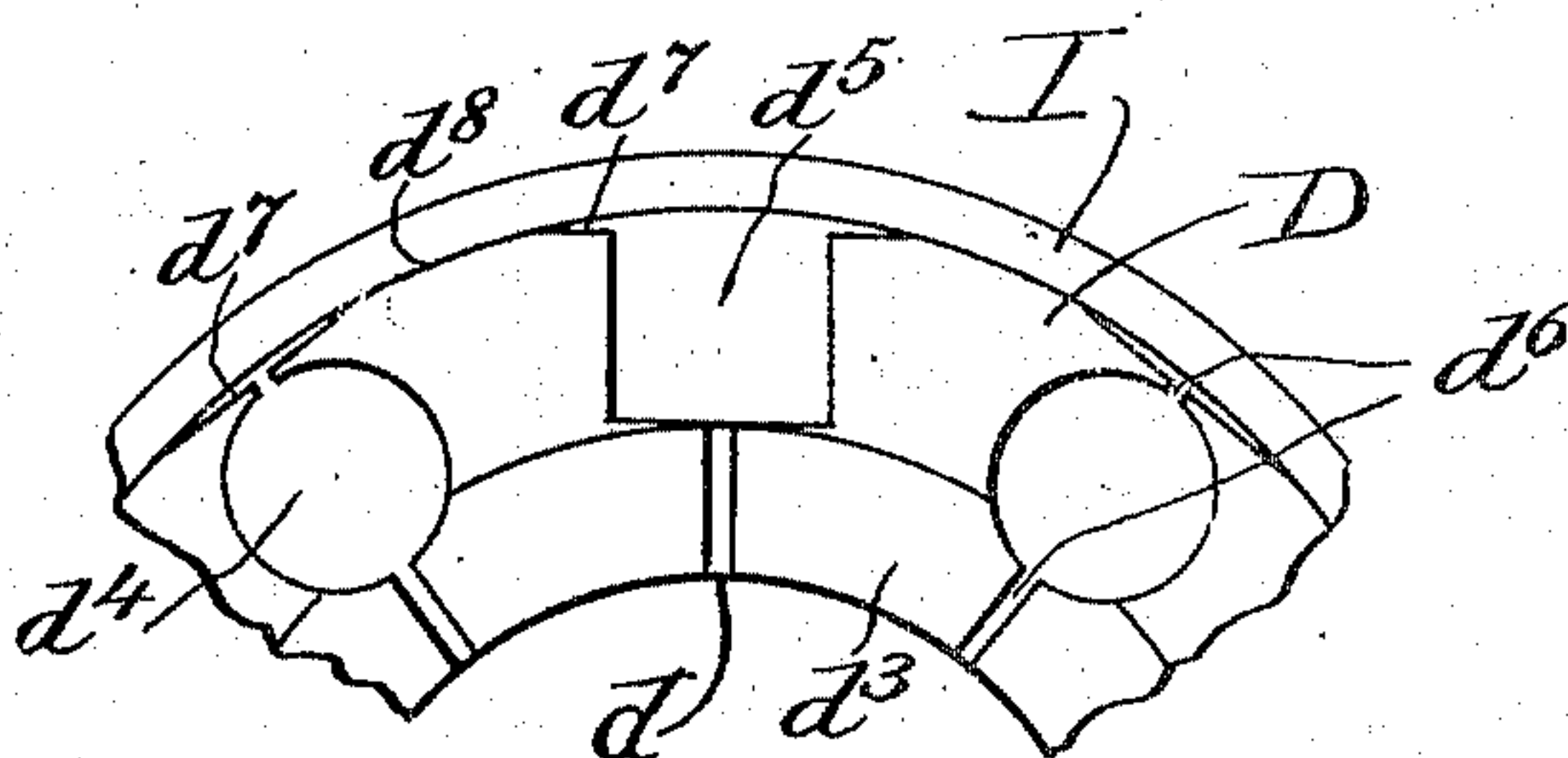


Fig 8



WITNESSES

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MACHINE FOR SEALING BOTTLES.

967,614.

Specification of Letters Patent. Patented Aug. 16, 1910.

Application filed September 22, 1908. Serial No. 454,275.

To all whom it may concern:

Be it known that I, PAUL CONRAD, a subject of the Emperor of Germany, and a resident of the city of Chicago, Cook
5 county, Illinois, have invented certain new and useful Improvements in Machines for Sealing Bottles; and I do hereby declare that the following is a full, clear, and exact description of the same, reference be-
10 ing had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in that class of machines for sealing bottles
15 wherein a metallic sealing cap is adapted to be applied to the neck of the bottle with drawing pressure to close the flange thereof under the bead on the bottle neck and thereafter while the pressure is still maintained
20 to dish the central part of the cap or seal inwardly.

Of the numerous chucks or throats for machines of the class described heretofore devised, great difficulty has been experi-
25 enced in providing sufficient resiliency or adaptability of the throat or the chuck to enable the same to conform to the bottle neck should the same be slightly irregular in contour, as for instance, should the same
30 be slightly oval instead of circular. For this purpose, many expedients have been tried, among others a more or less resilient backing and a somewhat rigid ring of harder metal within the same and perma-
35 nently secured thereto which is parted longitudinally to permit the parts thereof to yield independently of each other. This is not entirely satisfactory, however, for the reason that the unequal yielding of the
40 parts sometimes results in scoring or cutting the cap in a manner to remove the tin coating or even to cut entirely through the metal, in either event, resulting eventually
45 in a leak and destroying the value of the cap.

The object of this invention is to provide a sealing head or chuck adapted to maintain firm pressure upon the cap during the
50 period that the flanges thereof are being drawn and pressed inwardly beneath the bead and to maintain and augment such drawing pressure until the flange is entirely closed beneath the bead and in the particular construction shown, until the central
55 portion of the cap is driven inwardly or

concaved thus affording an inner, as well as an outer seal.

It is a further object of the invention to afford a throat for a sealing head or chuck such as described by the use of which posi-
60 tive drawing pressure is maintained upon the flange of the sealing cap to force the same beneath the bead; such throat, however, being so constructed that though of a unitary nature, the throat may conform
65 readily to the contour of the neck of the bottle.

It is further an object of the invention to afford a throat for a machine of the class described adapted to be used either in con-
70 junction with or independently of the mechanism for concaving the top of the seal and to afford a construction also in which the pressure exerted within the throat as the bottle neck rises therein acts to adjust the
75 throat to exactly fit with uniform pressure about the periphery of the seal.

It is further an object of the invention to afford in connection with a device such as described a drawing throat having radi-
80 ally weakening slits or slots therein near the inner side thereof, the portion between said slots or slits being fulcrumed or pivoted on a containing band or ring.

It is a further object of the invention to afford in connection with a device such as described supporting detents so constructed as to permit but one sealing cap to be re-
85 ceived therein with each bottle.

The invention consists in the matters hereinafter described and more fully pointed out and defined in the appended claims.

In the drawings: Figure 1 is a view in side elevation of a sealing machine adapted to be individually operated and the bottles
95 with the sealing cap thereon to be manually inserted. Fig. 2 is an enlarged longitudinal section of the sealing heads showing the position the parts assume at the preliminary stage of the operation, or when the sealing
100 cap on the bottle neck is first inserted into the machine. Fig. 3 is a similar view and illustrates the drawing and pressing of the flange of the cap beneath the bottle bead as the cap nears the inward limit of travel.
105 Fig. 4 illustrates the completion of the seal by the release of the hammer which strikes the central plunger downwardly. Fig. 5 is an enlarged central section of the throat showing the parts in elevation. Fig. 6 is
110

a top plan view of the same. Fig. 7 is a section on line 7—7 of Fig. 5. Fig. 8 is an enlarged fragmentary top plan view.

As shown in the drawings: A, indicates the frame of the sealing machine, which, as shown, is provided with a foot lever a , for actuation and a sealing head or chuck B, carried on a vertical shaft b , and movable in the standard A, and actuated by the foot lever and adapted thereby to be forced downwardly over the bottle X, shown in dotted lines and supported on the adjustable table B'. Said head B, comprises a cylindric shell or casing B², internally threaded at its upper end and externally threaded at its lower end and provided, as shown, in its interior near its lower end with a peripheral rib b' , which divides said casing into a lower small chamber and an upper larger chamber. Secured in said lower chamber is the drawing ring or chuck proper, sometimes denominated a throat. This, as shown, consists in the present instance of a drawing ring of hard bronze indicated by D, and which is provided with a relatively large bore at its lower end which tapers slightly upwardly to the draw of said ring indicated by d , where the inward taper or angle is somewhat abrupt to a point constricting the bore of said ring approximately to the size of the bottle neck in cross section plus the thickness of the flange of the sealing cap. From this point, the bore d' tapers inwardly at a slight angle to increase the pressure on said flange to draw the same downwardly beneath the bead as the bottle is forced upwardly or, what is to the same purpose, as the chuck or throat is forced downwardly over the bottle neck with the cap thereon. It is of the utmost importance to afford a high degree of resiliency in said throat or chuck to permit of perfect adaptation to the cross sectional contour of the bottle neck, and for this purpose, said drawing ring is provided on the outer side and extending inwardly to near the inner periphery thereof with radial and longitudinal passages or bores d^4 — d^5 , and slits or cuts d^6 , opening therefrom arranged equal distances apart and reducing the thickness of the drawing ring D, sufficiently to impart a high degree of resiliency thereto, and the otherwise cylindric drawing ring is flattened or cut away at d' longitudinally at the periphery at each of, and at a right angle with, said slots, thus affording a central fulcrum line d^8 for each segment between adjacent slots.

As shown, alternate passages or bores are square to receive therein the spring detents or catches G, each of which, as shown, is provided with an inwardly directed finger or claw g , rounded downwardly from its point and held inwardly as shown in Figs. 2 and 5, by means of a leaf spring g' , so that

the finger g , thereon will engage beneath the flange of the cap to center the same exactly upon the bottle neck as the same approaches the drawing throat of the drawing ring. Said detents are each provided with an inwardly projecting detent or claw g^2 , and both claws, detents or fingers extend through short slots d^9 , cut entirely through the lower part of the drawing ring. Said drawing ring serves to limit the upward movement of the claw with the cap thereon by engagement of the claw g^2 against the drawing ring at the top of the slots d^9 , and the under side of the claws g^2 being inclined outwardly permits the cap to slip back to the detent g . As shown, the metal is cut away at the top of the drawing ring, from near the bore thereof to the periphery, thus affording a circular fillet d^3 , of uniform width surrounding the bore of the ring and which bears at all times against the internal peripheral rib b' , in the casing B². Threaded on the lower end of the casing is the chuck head B³, having an upwardly tapering mouth as shown in Fig. 2, which serves to center the neck of the bottle in the drawing ring.

Slidable in the upper or larger chamber is a presser foot E, having a peripheral flange at its lower end e , which fits within said casing and bears against said rib or shoulder b' , before described. Said presser foot is provided in its lower end with a central cavity or recess adapted to receive the enlarged head F, of a holding die, the lower end of which is shaped to fit on the sealing cap, and to firmly hold the same in place on the bottle neck while the flange thereof is being drawn downwardly. The holding die is shaped to fit on and partly within the top of the sealing cap and is free to rise as the bottle seal enters the throat, except for the resistance of the presser foot. For the purpose of affording the requisite resistance to such upward movement, a strong spiral spring E', bears against the flange e , on the presser foot and at its upper end bears against an adjusting ring E², threaded in the upper end of the casing and whereby tension of the spring may be varied by adjusting said ring inwardly or outwardly therein. Slidably engaged in a suitable aperture at the axis of said presser foot and the holding die F, is a plunger H, which normally rests lightly upon the center of the sealing cap indicated by X', but which eventually is impelled downwardly to concave the top of the cap or to produce any desired configuration thereof. For this purpose, as shown, an adjusting bolt h , is provided in the upper end of the plunger H, and slidably supported in a conical and adjustable tripping block H', is a hammer h' , which is normally held at the lower limit of its travel by means of a spring h , which

bears against the under side of the tripping block and on the head h' , of the hammer.

Pivotaly engaged on the upper end of the presser foot E, are upwardly directed arms e' , each of which is provided with oppositely disposed and inwardly directed fingers e^2 , adapted to engage beneath the head of the hammer h' , to force the same upwardly, as the presser foot rises and as shown, a spring e^3 , is provided for each of said arms e' , which hold the upper end thereof inwardly or in position for the fingers to engage the hammer. Said tripping block is, of course, adjusted in the adjusting ring E^2 , to a position such that the ends of the arms e' , engage the inclined ends thereof as the presser foot rises to force said arms oppositely, thereby releasing the hammer and permitting the same to strike a blow upon the head of the plunger to shape the top of the cap.

The operation is as follows: Owing to the construction of the drawing ring, which is contained in a strong band or cylinder shell I, the ring may extend in any direction to adapt itself with the cross sectional contour of the bottle neck. Of course, in that event, the segments forming said ring to a certain extent rock on the fulcrum points within a strong containing band or shell I, which fits in the end of the casing B^2 . Such movement or displacement outwardly of portions of the drawing ring are, of course, compensated in part by the inward drawing of other portions of the ring, thus the ring is enabled to dispose itself either in circular form, in elliptical form or even in some angular form, owing to the resiliency of the material of which formed; the drawing ring at all times, however, having a positive support except opposite the flattened faces of the segments, enables the same to compensate for the slight inequalities in the bottle neck so frequently found. Owing to the shape of the double claws or fingers, which protrude into the bore of the chuck the cap when pressed inwardly thereover on the neck of the bottle is exactly centered within the drawing ring, the cap being held horizontally on the bottle neck by means of said fingers. The somewhat abrupt angle at the beginning of said throat applies downward stress upon the top of the cap, drawing or pressing the flange inwardly and crimping the same beneath the bead, at the same time the pressing die F, under the pressure of the spring E' , (which approximates several hundred pounds) bears firmly on the top of the cap. The relative movement of the chuck and bottle, however, forces the bottle neck with the cap thereon inwardly, thus pushing the presser foot and the hammer upwardly against the tension of the springs, while the plunger H, rides lightly on the top of the seal until the flange is firmly

closed beneath the bead. At this time, which corresponds with the highest limit of travel of the cap, the hammer is released by the outward movement of the arms e' , by engagement with the tripping block H' , and in consequence a blow, which may be graduated by the tension exerted by the spring H^2 , is struck on said plunger, thus dishing the center of the cap inwardly or producing any desired conformation thereof. The spring assists to force the neck of the bottle downwardly preparatory to receiving another bottle.

Of course, I am well aware that a drawing ring constructed as described and provided with an integral drawing throat portion may be used in connection with practically any of the machines heretofore used and may be considered entirely aside from, and independent of, the plunger for forming the top of the seal. However, the same are adapted for joint use, and are, in fact, conjointly used in many instances, inasmuch as the pressing die firmly holds the metal cap upon the top of the bottle neck, while the drawing ring maintains its firm and drawing pressure on the flange, during the period in which the blow is struck by the plunger. Any inequalities in the bottle neck are in consequence entirely filled by the seal and its packing material to effectively prevent leakage.

I do not purpose limiting this application for patent in any particular, otherwise than necessitated by the prior art, as very many details of the construction may be omitted or varied without departing from the principles of this invention.

I claim as my invention:

1. In a device of the class described a drawing ring, comprising an integral ring having an inwardly tapered bore, and provided with outwardly directed flanges, radial slots in said flanges and the outer side of said ring to reduce the ring in thickness and afford resiliency, said flanges being flattened at said slots to afford a fulcrum point between adjacent slots, and a strong cylindrical band inclosing said flanges and affording a bearing for said fulcrum points.

2. In a device of the class described a drawing ring, comprising an integral ring having an inwardly tapered bore, and provided with outwardly directed flanges, radial slots in said flanges and the outer side of said ring to reduce the ring in thickness thereat and afford resiliency, said flanges being flattened at said slots to afford fulcrum points therebetween, a strong cylindrical band inclosing said flanges and affording a bearing for said fulcrum points and claws protruding into the bottom of the ring.

3. In a device of the class described a one piece drawing ring, having an inwardly tapered bore or throat, and provided with

outwardly directed flanges, radial slots in said flanges and the outer side of said ring to reduce the ring in thickness and afford resiliency, holding claws in alternate slots, said flanges being flattened at said slots to afford fulcrum points therebetween and a strong resilient cylindric band inclosing said flanges and affording the bearings for said fulcrum points.

4. In a device of the class described a drawing ring having an inwardly tapered bore or throat and provided with outwardly directed side flanges, and having radial slots in said flanges and the outer side of said ring to reduce the ring in thickness and afford resiliency, said flanges being flattened at said slots to afford fulcrum points therebetween, a strong cylindric resilient band inclosing said flanges and affording bearings for said fulcrum points, and spring pressed detents each provided with two claws protruding into the ring at the bottom.

5. In a machine of the class described the combination with the drawing ring, of detents extending inwardly beneath the same and each having a plurality of upwardly facing shoulders and downwardly and outwardly inclined faces, and springs pressing the detents inwardly.

6. A bottle sealing mechanism embracing mechanism for applying pressure on the cap peripherally at the inner edge of the bottle neck, mechanism for drawing and pressing the flange inwardly and mechanism for pressing the center of the cap inwardly while maintaining the aforesaid inner peripheral pressure on the cap and against the flange thereof, reciprocating mechanism for actuating the mechanism for pressing the center of the cap inwardly and double clawed spring detents for supporting the cap in place prior to sealing.

7. A bottle sealing mechanism embracing non-expansible mechanism for applying pressure on the cap, a spring adapting said mechanism to yield upwardly, mechanism for crimping the flange of the cap beneath the bead of a bottle, a spring actuated plunger for forcing the center of the cap into the mouth of the bottle to provide an inner seal, and engaging claws for the cap or seal adapted to prevent entrance of more than one cap.

8. In a machine of the class described a plunger adapted to rest loosely upon the middle of the sealing cap until near completion of the sealing operation and a reciprocating spring operated hammer adapted to strike said plunger downwardly to dish the middle of the cap, mechanism adapted to automatically actuate the hammer to increase the tension of the spring prior to the hammer striking the plunger, and means centering the cap in position for sealing and acting to refuse more than one seal at a time.

9. In a bottle sealing device mechanism for forming the outer seal, upwardly yielding means exerting pressure on the top of the cap to hold the same tightly against the top of the bottle, means resisting upward yielding of the same, a plunger extending axially through the pressure exerting means, and means elevated by upward movement of said pressure exerting means and automatically released to actuate the plunger to aid in sealing the cap.

10. In a device of the class described mechanism for sealing the central portion of a cap, mechanism exerting pressure on the cap during the sealing operation, releasable mechanism carried by the pressure exerting mechanism for automatically adjusting a part of the sealing mechanism to operate the other part of the sealing mechanism, mechanism for sealing the outer flange of the cap and spring pressed independently movable fingers adapted to center the bottle in the machine.

11. In a device of the class described a drawing ring provided with passages and longitudinal slots to near the inner side thereof.

12. In a device of the class described a solid drawing ring having a central tapered bore, said drawing ring having passages therethrough and slits opening from the passages to the outer periphery of the ring and to nearly the inner periphery.

13. In a device of the class described a drawing ring having a central bore and large longitudinal passages through the walls thereof, the walls slitted inwardly and outwardly from the passages.

14. In a device of the class described a drawing ring having a central bore and large longitudinal passages through the walls thereof, the walls slitted inwardly and outwardly from the passages, and a plurality of fulcrum lines on the outer side of the drawing ring.

15. In a device of the class described a drawing ring having a central bore and large longitudinal passages through the walls thereof, the walls slitted inwardly and outwardly from the passages, and a non-expansible shell inclosing said drawing ring.

16. A drawing ring comprising a ring having a central bore and longitudinal opening through the walls thereof, and radial slots extending toward and from the central bore and the drawing ring provided with alternate flat and round exterior faces.

17. A drawing ring comprising a solid metal ring and parts of the metal removed to provide a resilient drawing ring with a solid inner wall.

18. A drawing ring comprising a solid metal ring and parts of the metal removed to provide a resilient drawing ring with a solid inner wall, and a shell inclosing the expan-

sible drawing ring, said drawing ring shaped to provide fulcrum lines.

19. A drawing ring comprising a ring having a tapered throat and having passages cut through walls thereof to reduce the metal and provide resiliency and centering jaws in part of the passages.

20. A drawing ring comprising a ring having a tapered throat and having passages cut through walls thereof to reduce the metal and provide resiliency, and means set in part of said passages adapted to hold one cap and to prevent more than one from being held in capping position.

21. In a device of the class described a drawing ring having a tapered bore, the walls of said ring slotted longitudinally and the slots communicating with the bore at the upper and lower ends only.

22. In a device of the class described a drawing ring of solid metal having slots to provide resiliency and recesses opening through the lower circumference and means set in the recesses adapted to hold a cap.

23. In a device of the class described an expansible drawing ring having a central bore and the outer circumference of the ring being alternately flat and round.

24. In a device of the class described an expansible drawing ring having a central

bore and the outer circumference of the ring being alternately flat and round, and a rigid band around the ring contacting the round surfaces only.

25. A drawing ring adapted to seal a cap and provided with exterior flat and rounded portions.

26. A drawing ring having its outer surface alternately rounded and flat longitudinally of the ring.

27. A drawing ring having its outer surface alternately rounded and flat longitudinally of the ring, and the ring slotted between adjacent flat and rounded faces.

28. A drawing ring having its outer surface alternately rounded and flat longitudinally of the ring, the ring slotted between adjacent flat and rounded faces, a ring inclosing the drawing ring, and spring pressed members each having a plurality of inclined jaws projecting through the lower end of the drawing ring.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

PAUL CONRAD.

Witnesses:

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K. E. HANNAH.