No. 798,549. PATENTED AUG. 29, 1905.

W. H. WHEELER.

CROWN CORK FEEDER.

APPLICATION FILED MAR. 26, 1904.

7 SHEETS—SHEET 1.

Fig. 1.

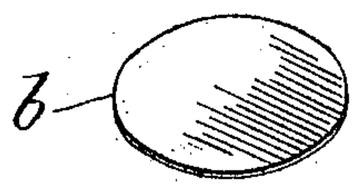

Fig. 2.

Fig. 3.

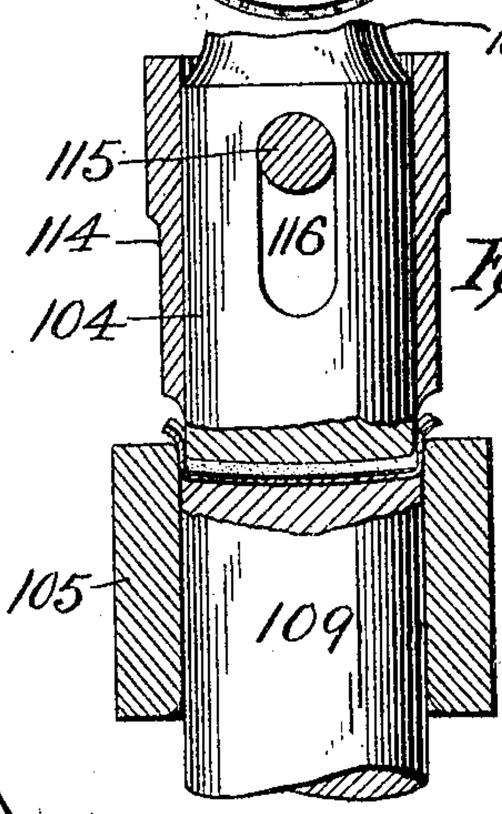

Fig. 4.

Fig. 5.

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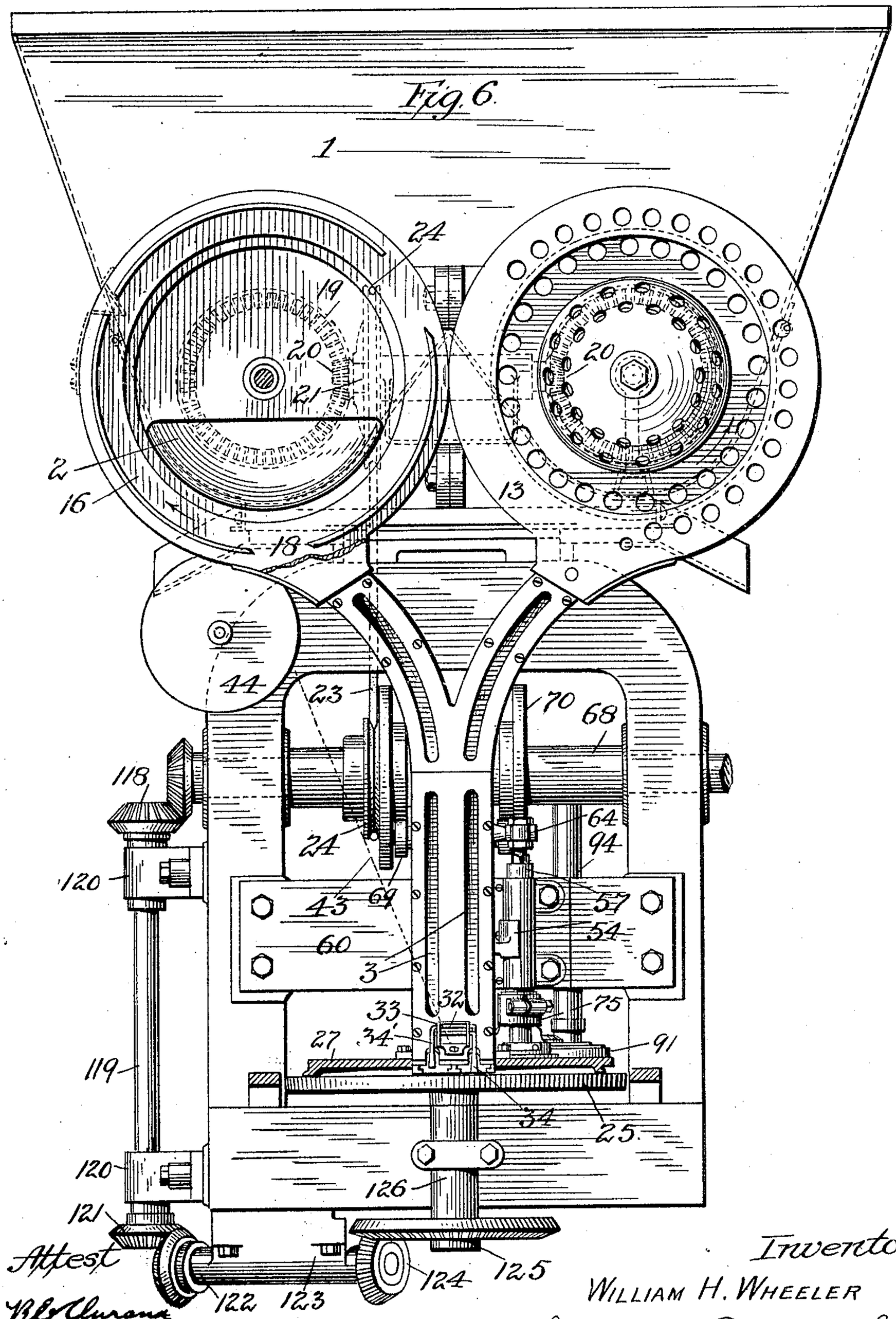
7 SHEETS—SHEET 2.

Fig. 6.



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7 SHEETS—SHEET 3.

Fig. 7.

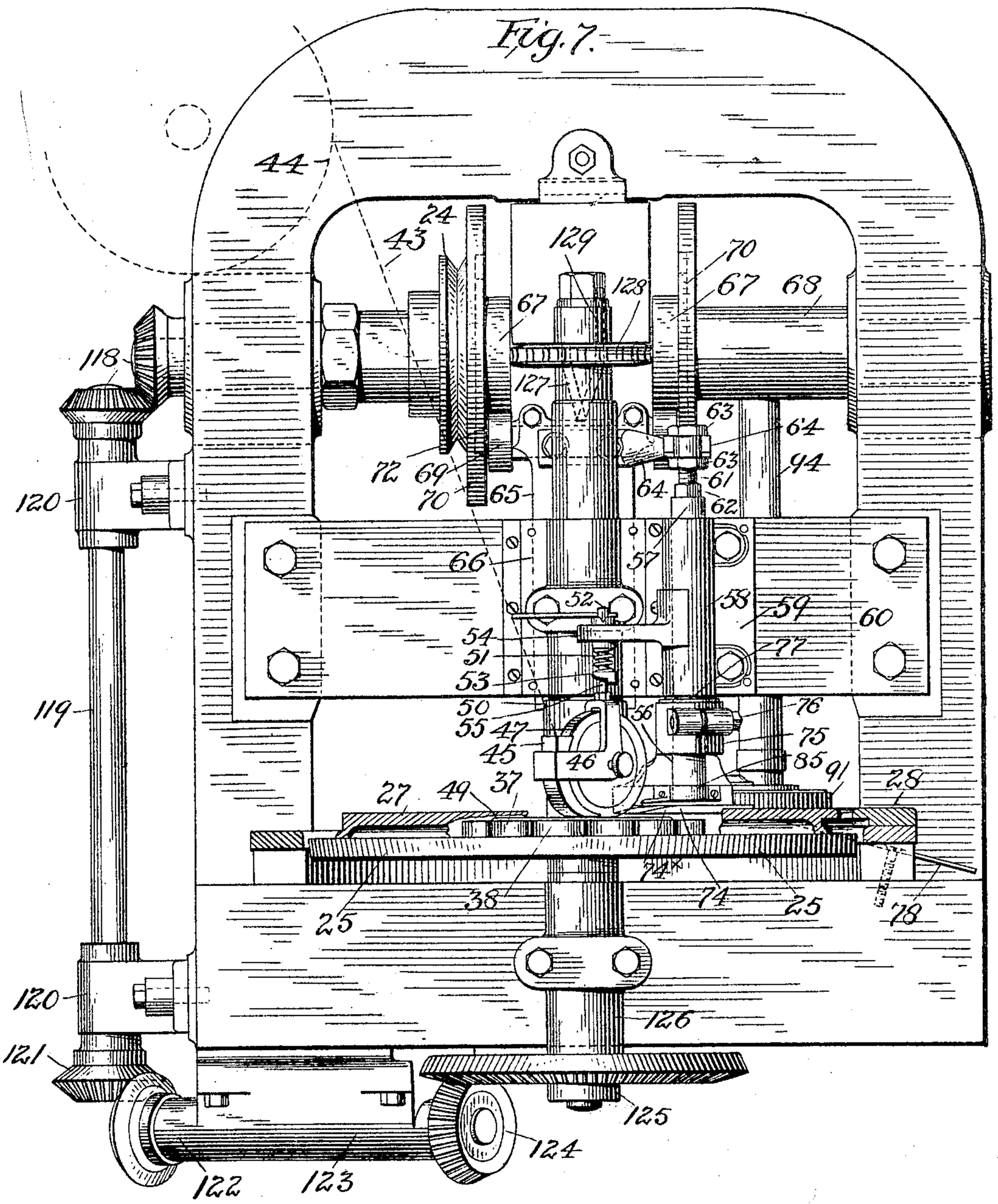
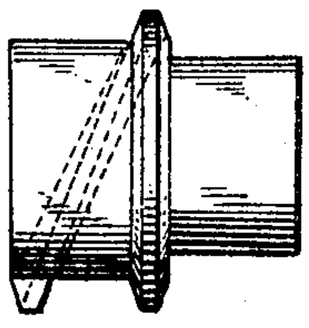


Fig. 16



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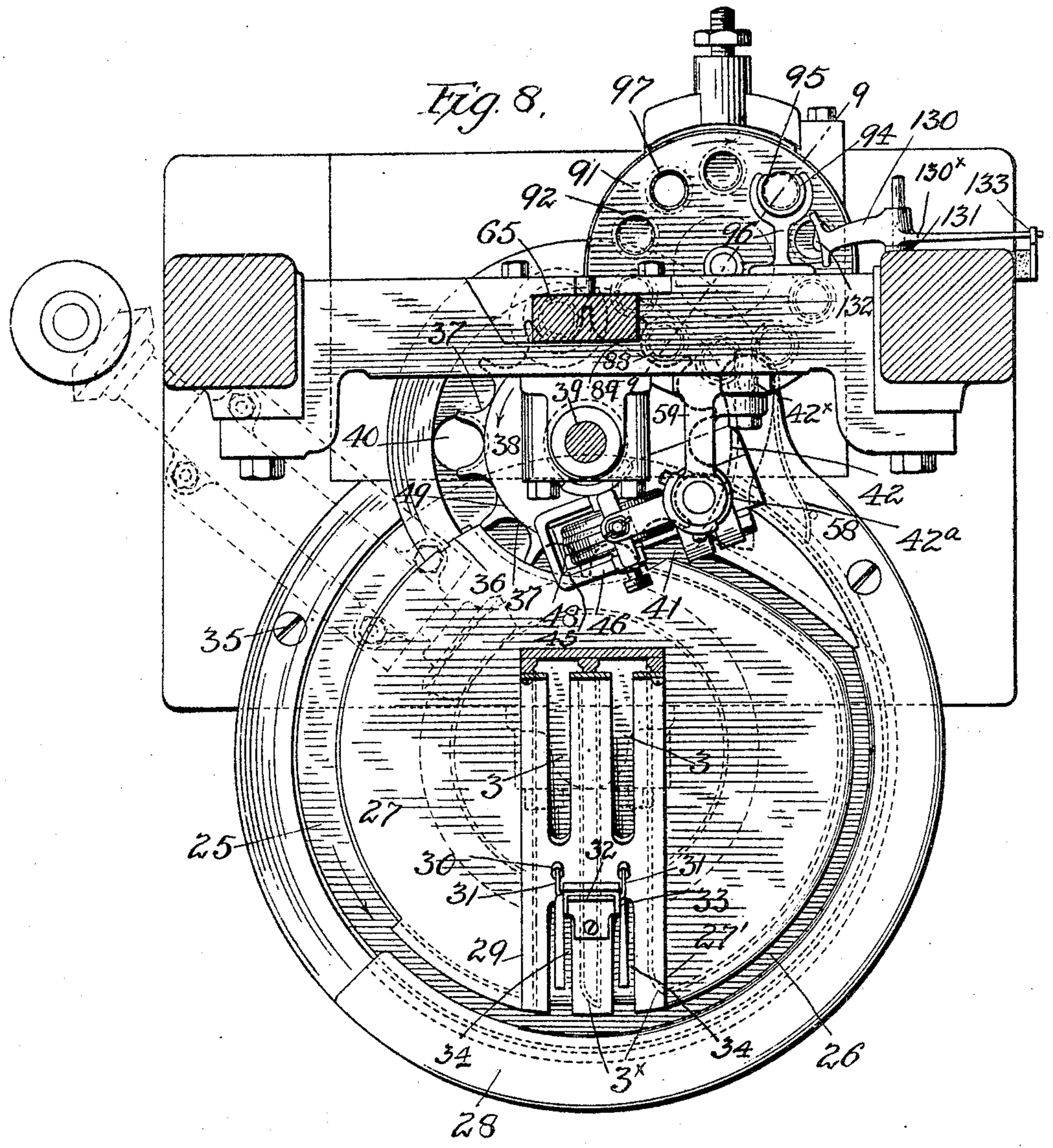
7 SHEETS—SHEET 4.

Fig. 8.



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7 SHEETS—SHEET 5.

Fig. 9.

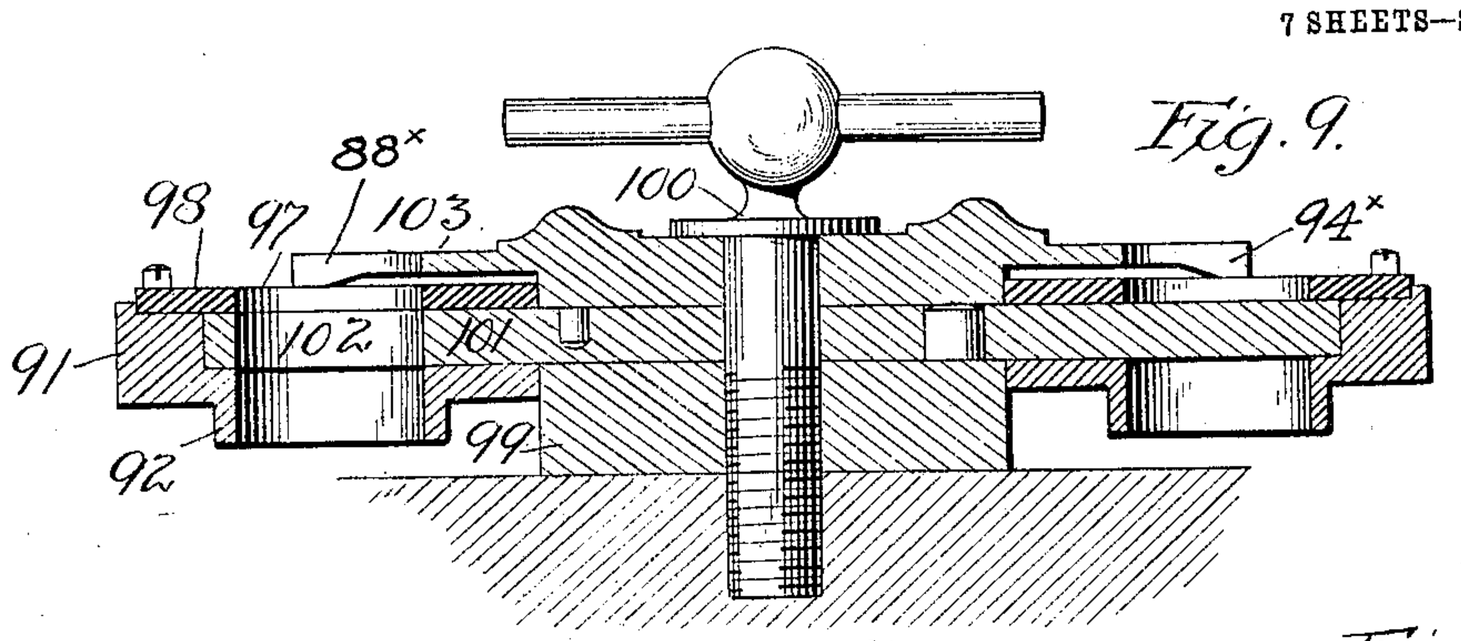


Fig. 10.

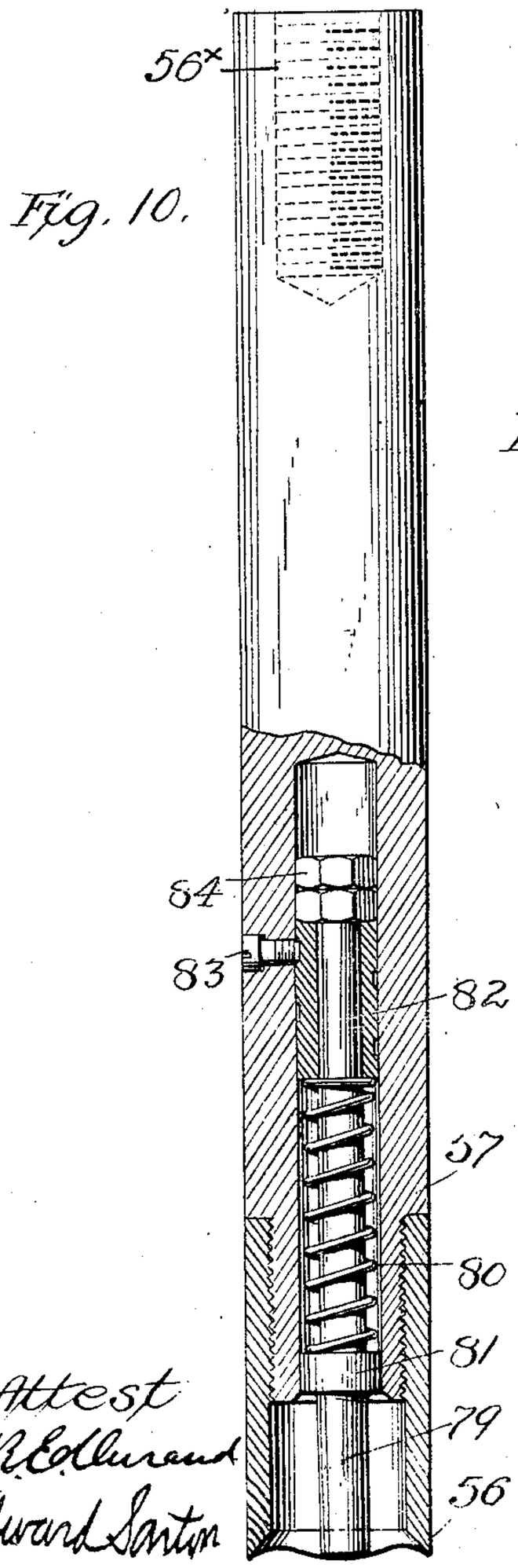


Fig. 11

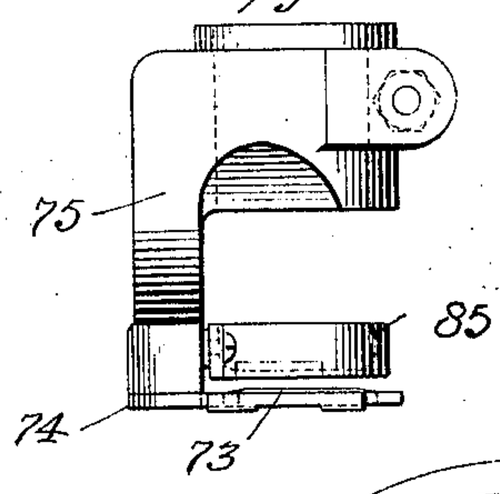


Fig. 11a

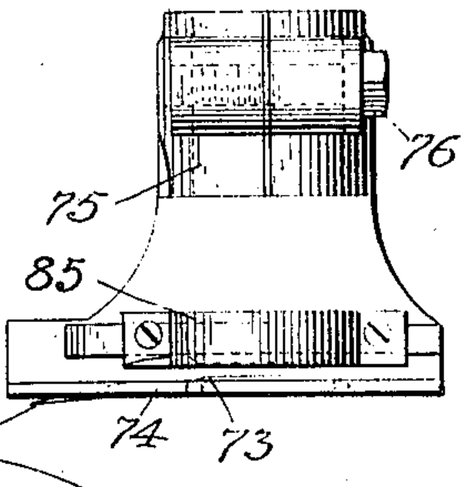
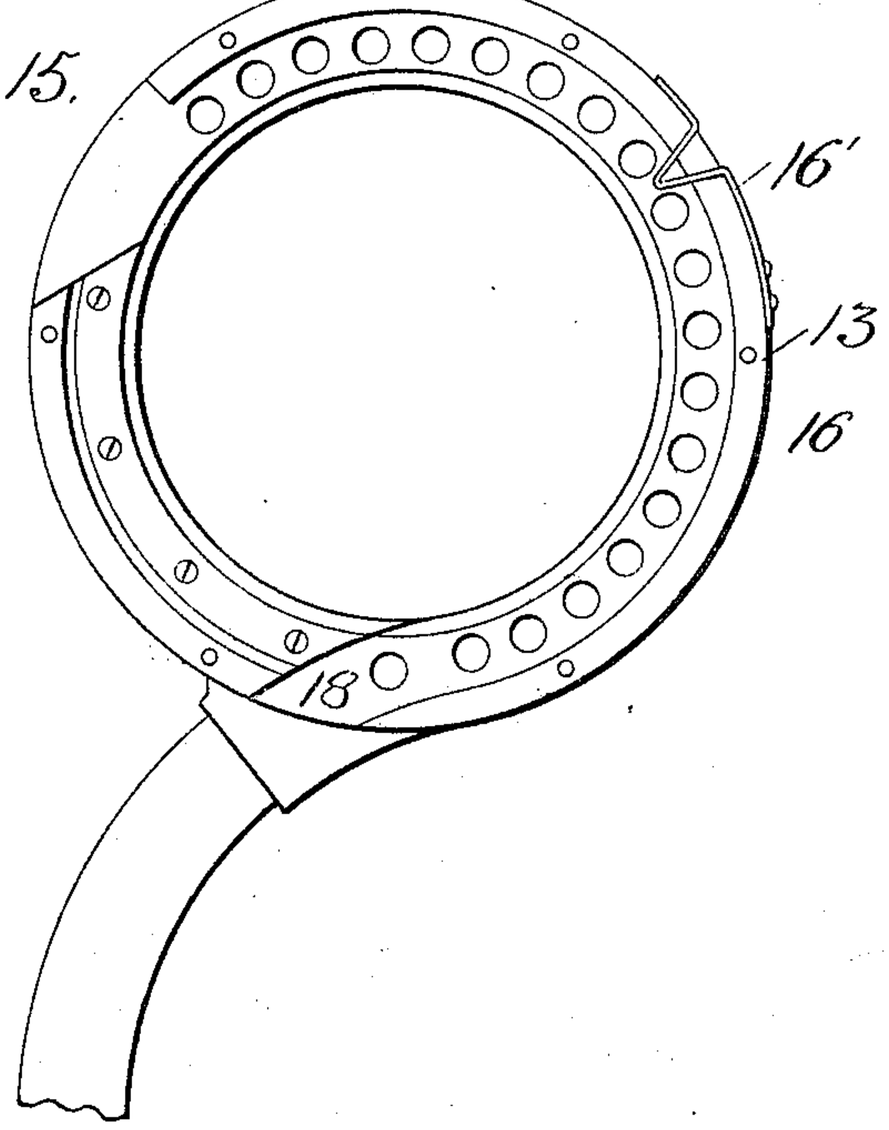


Fig. 15.



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7 SHEETS—SHEET 6.

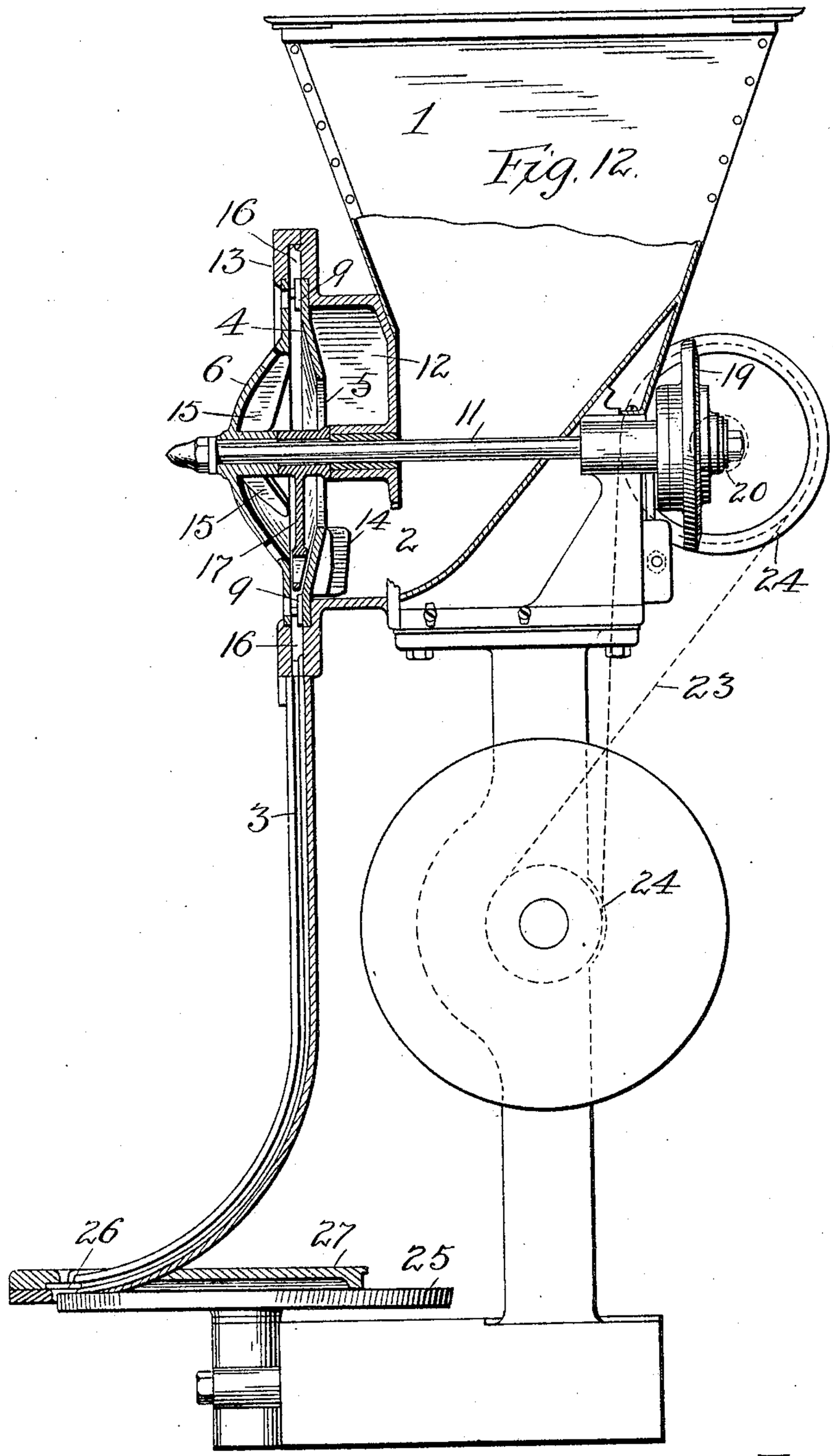

Fig. 12.

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APPLICATION FILED MAR. 26, 1904.

7 SHEETS—SHEET 7.

Fig. 13.

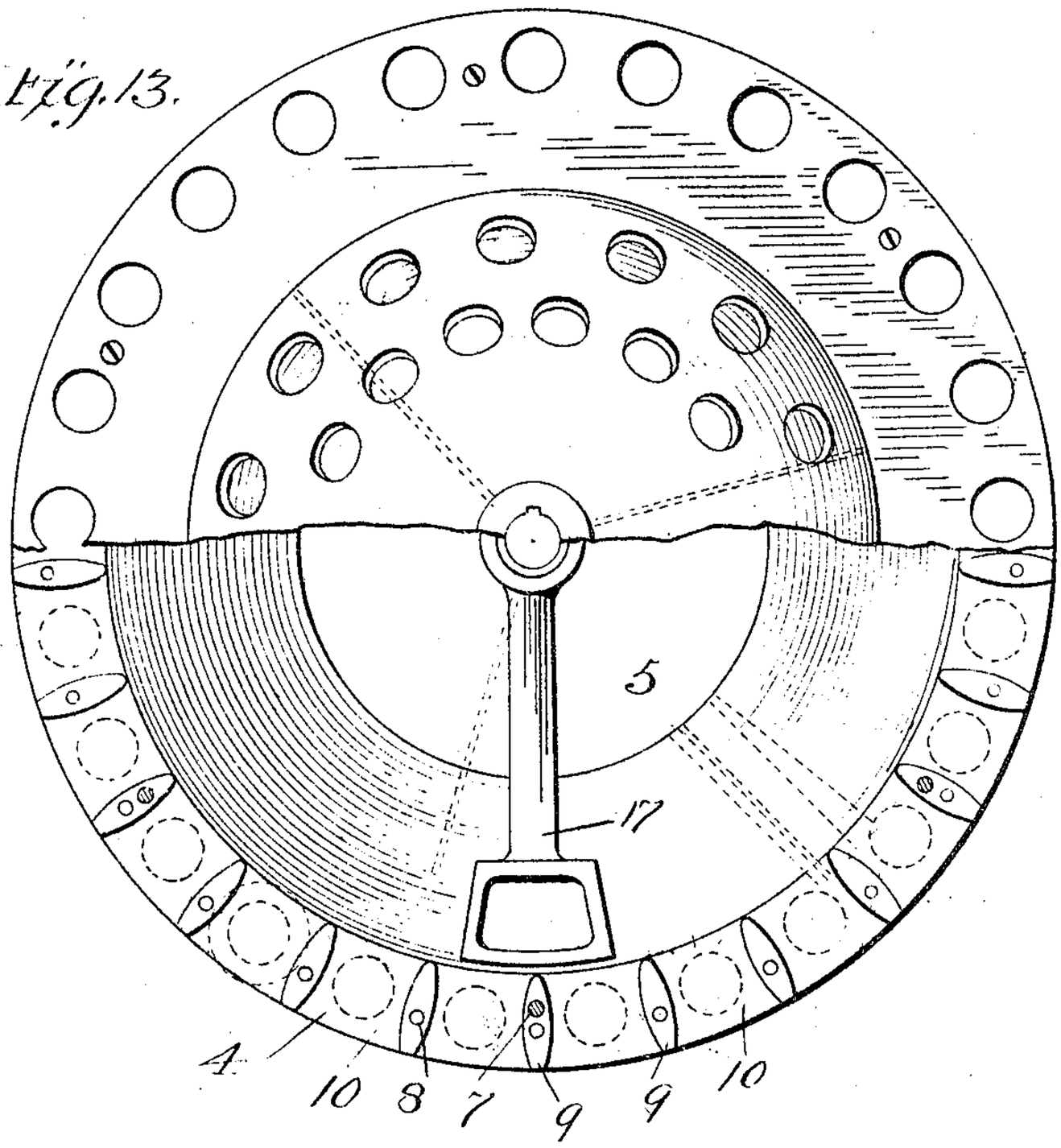


Fig. 14.

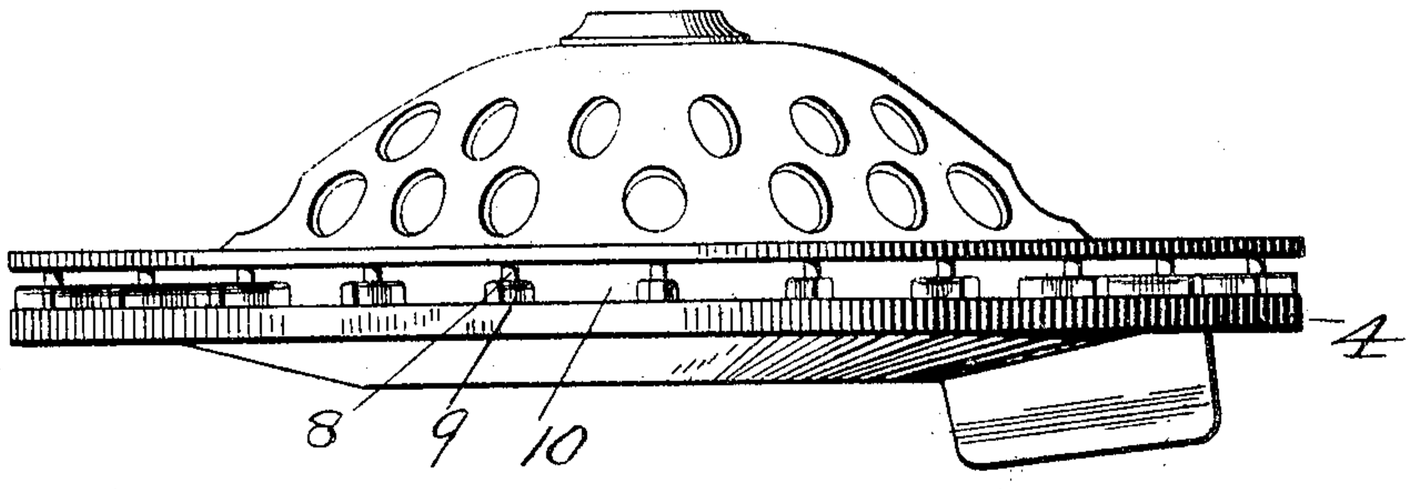
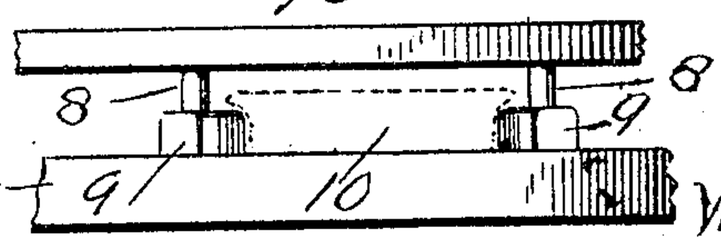


Fig. 14a.



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UNITED STATES PATENT OFFICE.

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CROWN-CORK FEEDER.

No. 798,549. Specification of Letters Patent. Patented Aug. 29, 1905.

Application filed March 26, 1904. Serial No. 200,216.

To all whom it may concern:

Be it known that I, WILLIAM H. WHEELER, a citizen of the United States, residing at Baltimore, Maryland, have invented certain new and useful Improvements in Crown-Cork Feeders, of which the following is a specification.

My invention relates to apparatus for making closures for bottles, and more particularly to means adapted to produce the form of composite bottle-sealing cap well known as the "crown-cork." This comprises, preferably, a metallic cap or crown having a corrugated flange to be locked to the exterior of the bottle-head, a compressible sealing-disk or packing of cork or the like held within the metallic cap, and a disk of impervious material located between the metallic cap and the cork disk.

In carrying out my invention I provide a machine or organization which assembles and unites the parts of the composite caps whether these parts be two or more in number and for that form of composite sealing-cap which is made up of a sealing-disk, a metallic cap, and an interposed impervious disk collet. I prefer to have the machine in addition to assembling and uniting the parts make the collets and at once assemble them with their respective metallic caps, one for each, after which a sealing-disk is placed upon each collet as it lies in its cap and the parts are then united by the action of the machine.

In the accompanying drawings, Figure 1 is a sectional view of a metallic cap inverted or in the position in which it passes through the machine ready to receive the other part or parts of the composite sealing-cap. Fig. 2 is a perspective view of an impervious disk or collet of paper which is adapted when such is used to fit within the metallic cap. Fig. 3 is a perspective view of the sealing-disk, of cork or other elastic material, adapted to fit within the metal cap upon the impervious collet. Fig. 4 is a sectional view representing the component parts of the sealing-cap assembled in position within the machine and united by pressure. Fig. 5 is a central vertical section through the machine from front to rear, some parts being shown in elevation. Fig. 6 is a front view of the apparatus with parts in section and parts omitted. Fig. 7 is an enlarged view similar to Fig. 6 with parts omitted and parts in section. Fig. 8 is a plan view of the apparatus with some of the parts in section. Fig. 9 is a central vertical sectional view on line 9 9 of Fig. 8 through the cork-carrier. Fig. 10 is a vertical sectional view of the cutter for the impervious disks or collets, the stem of said cutter being partly in side elevation. Figs. 11 and 11[a] represent the female die for the collets and the shield associated with this cutting mechanism. Fig. 12 is a vertical sectional view through one of the automatic feeders for the metallic caps, parts of the apparatus being omitted. Fig. 13 is a detail front view, partly broken away, of the rotary distributer for the metallic caps. Fig. 14 is a detail side or edge view of part of Fig. 13, enlarged. Fig. 14[a] is a detail view, enlarged, of a part of Fig. 14. Fig. 15 is a side view of the distributer shown in Fig. 12. Fig. 16 is a detail view of the worm.

The work to be done by the present machine, which represents one of the several forms my invention may assume, will be readily understood from an inspection of Figs. 1 to 4. The metallic cap or crown *a* is held in the machine in the inverted position. (Shown in Fig. 1.) A collet *b* is cut by the machine from a strip of impervious material and is placed in the inverted metallic crown or cap. A previously-cut cork disk *c* is next placed by suitable mechanism within the inverted crown and upon the impervious collet. The assembled parts of the composite sealing-cap are next located between a pair of dies, and these dies press the parts of the sealing-cap into close contact, as shown in Fig. 4, and also press the vertical walls of the metallic cap inwardly or, more strictly speaking, slightly reduce the diameter of the metallic cap, so as to firmly grip the sealing-disk, and thus unite the component parts of the sealing-cap.

In carrying out my invention component parts of the closure or sealing-cap—such, for instance, as the metallic caps and the sealing-disks—are fed automatically from supply-hoppers to the point of assembling, while the material from which the collets are formed is fed automatically to the cutting means and to the point where the said collets are placed in the metallic caps.

The supply-hopper for the metallic crowns is shown at 1, Figs. 6 and 12, provided with two outlets, one of which is indicated at 2, Fig. 12, leading to the two chutes 3, which direct the metallic caps to the surface of a rotary crown feeding or carrying plate 25.

Interposed between the outlets of the crown-hopper and the chutes are a pair of rotating distributers adapted to take the crowns or metallic caps from the outlets 2 and distribute them in such a manner that they will lie in a row in the chute 3 and each with its concave face directed outwardly. For this purpose each distributer is composed of a frusto-conical plate 4, centrally perforated at 5 and arranged to rotate with a second plate 6, to which it is connected by screws 7, Fig. 13, said plates being held spaced apart by pins 8, Figs. 12, 14, and 15, a distance sufficient to permit the passage of a metallic crown between the said plates. The plate or ring 5 also carries a series of bosses 9, which reach only part way across the space between the two plates, so that, as shown in Fig. 15, if a metallic crown presents itself to the passage-way formed between two of these projections or bosses 9 it will pass through the said passage and into the chute, provided the said metallic cap lies in proper position to be passed through the apparatus, and receive the other parts of the composite closure. In the present instance the metallic cap must be disposed in the chute with its concave side to the front, and therefore the distributer is adapted to discharge through its passages 10 only those metallic crowns which are properly positioned. This, it will be seen from Fig. 15, is due to the fact that the metallic cap if properly positioned will pass through with its flange over the bosses 9, whereas if the cap lies in incorrect position its flange will strike the sides of the bosses and will be stopped thereby. The distributers are carried by shafts 11 in the manner indicated by Fig. 12 and rotate within casings 12, forming extensions of the hoppers, said casings being provided with cover-plates or rings 13. The crowns are lifted from the outlet 2, so as to fall into the distributers, by a blade or flange 14 on the inner side of the inner plate, and when thus raised the metallic caps will fall into the interior of the rotary distributer, and they will now be subjected to the rotary action of the distributer, in which they will be turned over and over until they present themselves in proper position to pass through the spaces 10, as before described. The distributers are each provided with flanges or blades 15, which serve to keep the crowns in motion, lifting and turning them into proper position. The metallic caps on leaving the rotary distributer pass into the channel 16, Figs. 6 and 12, and thence into the chute 3. The distributers move in the direction of the arrows shown in Fig. 6, which figure indicates that the left-hand distributer has been removed, together with its cover-plate. The caps feed to the chutes through the passage 18. A pendulum 17 is employed to prevent the crowns from wedging, said pendulum swinging freely on the shaft 11. This part, with its function, is similar to that of the pendulum disclosed in United States Patent No. 643,973, February 20, 1900. A spring 16′ is also employed to control the crowns which may be lifted by the rotary distributer, this part also being disclosed in said United States Letters Patent. The distributer-shafts are driven through bevel-gearing 19 and 20 from a shaft 21, Fig. 6, which is driven from the main shaft 68 of the machine by a band 23 and pulleys 24.

It will be noticed from Fig. 1 that the two chutes 3, one for each distributer, extend down and discharge onto the upper surface of the crown carrying or transporting plate 25, which rotates constantly in the direction of the arrow, Fig. 8, and carries the crowns one after the other along a channel 26, formed between a cover-plate 27 and a ring 28. The chutes 3 discharge the crowns into this channel 26 at or near the outer edge of the carrier-plate, for which purpose the cover-plate is cut away at 27′ to admit the lower ends of the chutes close to the surface of the rotary carrier. Onto this carrier the caps are discharged in inverted position. I provide two chutes in order to insure a constant feed of crowns to the carrying-plate, for in case either distributer is slow in positioning and distributing the crowns the other distributer will supplement it in the feeding action. I provide means for controlling the discharge of the said crowns from the chutes onto the rotating carrier-plate, so that only one chute at a time will be free to discharge the crowns. As illustrating one form of means for doing this I show a pair of stop-pins 30, Figs. 5, 6, and 8, one for each chute or channel, arranged to extend down into the same near its discharge end and obstruct the onward passage of the crowns. The arrangement is such that the stop-pins act alternately. Each stop-pin is carried by an arm 31 on a shaft 32, of which there are two, one for each stop-pin, which shafts are journaled in a housing or standard 33 on the upper side of the chute, each shaft having an arm 34, which extends down into the other channel from that obstructed by its pin, each of said arms 34, as shown in Fig. 5, extending along the channel in which it is arranged, so as to overlie and rest upon the crowns which may be passing through the said channel. As long as the crowns are passing through either channel or chute the arm therein will be raised, and consequently the stop-pin controlled by that arm and extending into the other channel or chute will be thrust downwardly, and thus effectually obstruct the said channel or chute, with the result that this channel will now fill up with crowns ready to be discharged. If now the supply of crowns becomes exhausted in the channel or chute first mentioned because of the slow distribution of the crowns thereto, the arm 34 in said channel will fall, and the stop-pin in the other channel will be lifted, freeing this channel for

the feed of the crowns, and as they pass under the arm 34 of this second channel they will raise the same and force down the stop-pin in the first-mentioned channel, which is now beginning to fill up. In this way any irregularity of discharge of the caps from the distributers is provided for, as each channel has sufficient time to fill up to the required extent while the crowns are being discharged one by one from the other chute or channel. The arms 34 have sufficient extent within the channels to bear on a number of crowns at once, and of course the arm will not fall when one crown passes from the chute, and it will only fall when no crowns are present beneath it.

It will be noticed, as shown in dotted lines, Fig. 8, that the right-hand walls of the channels or chutes are curved or flared toward the right, so as to permit the crowns to begin to move to the right as soon as they touch the rotating crown-carrier plate or transporting-wheel. The ring 28 is fixed at 35 to a part of the stationary frame, and the cover-plate 27 is held in fixed relation to the other parts by its connection at 36 to the stationary parts. This rotary plate 25 feeds the inverted caps or crowns one by one to the recesses or pockets 37 of a toothed wheel 38, fixed on a vertical shaft 39, to which an intermittent rotary movement is imparted in the direction of the arrow, Fig. 8, as will be hereinafter described. This wheel carries or transports the crowns from place to place to receive first the impervious collet, then the sealing-disk, then to the dies, and finally to the point 40, at which the composite seals are discharged from the machine.

As shown in Figs. 5 and 8, the crown-transporting wheel 38 partly overlies an adjacent portion of the crown-feeding plate 25, and it presents its pockets one by one to the mouth 41 of the channel 26 to receive the metallic crowns therefrom. Immediately after receiving a crown from the channel 26 the transporting-wheel 38 takes one step in the direction of the arrow, Fig. 8, and thus transports the crown into a position of rest directly beneath the means which cut the impervious collet from its strip and place the same in the inverted crown. The crown still rests upon the constantly-moving feeding-plate 25; but it is held stationary by the teeth of the transporting-wheel and is confined between the said teeth and the edge of the pivoted spring-pressed arm 42, dotted lines, Fig. 8. The pivot of this arm is indicated at $42^{\times}$ and its spring at 42^{a}. The paper strip from which the collets are cut has associated therewith or is formed of a suitable substance impermeable to the liquid to be bottled. It passes, as indicated at 43, dotted lines, Figs. 6 and 7, from a reel 44, suitably supported on the frame, to a guide 45, Figs. 5, 7, and 8, which is supported by arms of a bracket 46, in which bracket is journaled a feed-roller 47 and to the lower periphery of which the guide directs the paper strip. The guide is located opposite the periphery of the roller and is curved to conform thereto. This roller has a raised surface 48 on its periphery coacting with a raised rib or surface 49 on the crown-transporting wheel to feed the paper strip forward at each rotary step movement of the transporting-wheel. The bracket 46 of the transporting-wheel is attached to a sleeve 50, surrounding the shaft of the crown-transporting wheel loosely, so as to allow the roller 47 to have vertical play. The roller is pressed down to its work of aiding in feeding the paper by a spring 51, surrounding a stem 52, passing loosely through a bracket 54. The lower end of the stem has a head 53 to bear on a stud 55, projecting from the bracket 46 of the roller. The spring forces the head with the roller down, and the paper strip is thus firmly but yieldingly pressed by the roller upon the raised surface of the transporting-wheel and is fed step by step by the intermittent movement of this wheel to the cutting mechanism for making the collets.

The cutting and assembling mechanism for the collets comprises a cutter 56, Fig. 10, of circular form, removably attached to a plunger 57, movable vertically through the cylindrical part 58 of a bracket 59, Fig. 7, bolted to a stationary cross-bar 60 of the machine-frame. The plunger at its upper end has a screw-threaded socket $56^{\times}$, Fig. 10, receiving a screw-threaded extension 61, Figs. 5 and 7, which is held adjustably therein by a jam-nut 62. The stem has octagonal collets 63, between which the forked end of an arm 64 fits, said arm being attached to a slide 65, which is guided in a way 66 of the cross-bar 60 and is reciprocated vertically by cams 67 on a driving-shaft 68, journaled in the main frame, which cams engage rollers 69 on the slide, and by cams 70 also on the driving-shaft having grooves 71, receiving rollers or projections 72, the cams first mentioned serving to depress the slide and the grooved cams serving to lift the same. The collet cutter or punch coöperates with a female die or cutter 73, Figs. 11 and 11^{a}, arranged in a die-plate 74, fixed to the split foot-piece 75, which is clamped by a bolt 76 about the lower reduced extension 77 of the part 58.

As shown in Fig. 7, the die-plate has a beveled end $74^{\times}$ extending near to the pressure-roller 47, and the said plate lies close to the upper paper-feeding surface of the crown-transporting wheel, so that the paper strip as it is fed by the combined action of the pressure-roller and the crown-transporting wheel will pass up over the inclined end of the die-plate and across the female die or cutting member, where it will come to rest in position to be cut by the male cutter or punch, which now descends, cuts the collet from the

strip, and deposits the collet in the crown, which lies in the recess or pocket of the transporting-wheel directly below the opening in the female die, the perforated waste strip passing off at one side of the machine down the incline 78, Fig. 7.

In order to insure the placing of the collet in the inverted crown, a clearer-plunger 79, Fig. 10, is provided within the punch, the said clearer-plunger being pressed downwardly by a spring 80, bearing on a shoulder 81 of the plunger and upon a block 82, held within the plunger by a screw 83. The plunger has nuts 84 at its upper end which limit its downward movement, and by these the lower face of the plunger may be accurately adjusted in relation to the cutting edge of the punch, so that it will act to clear the collet from the punch when the clearer-plunger is in its advanced position. The clearer-plunger may yield slightly at the moment the punch cuts out the collet from the paper strip; but it immediately thereafter assumes its normal or advanced position to clear the collet from the punch and insure its discharge into the inverted crown. The collet passes through a shield 85, Figs. 7 to 11, and 11ª, attached to the foot-piece 74 and intended to protect the fingers of the operator from injury. Immediately after receiving the collet the metallic crown or cap is moved by the transporting-wheel into position to receive the sealing-disk of cork or other suitable compressible material. In this action the crown is moved by the step-by-step rotation of the crown-transporting wheel over the upper surface 86 of the fixed bed 87 of the machine, which surface, as shown in Fig. 5, is flush with the upper surface of the crown-feed plate 25, and when it arrives at the proper station it lies directly beneath a cork-assembling plunger 88, fixed to an arm 89, carried by the vertically-reciprocating slide 65. During the movement of the crown by the transporting-wheel it is guided by the spring-arm before mentioned, partly surrounding the transporting-wheel. The cork disks are brought one by one beneath the cork-assembling plunger and directly over the crowns by a cork-carrier 91, which is moved step by step to correspond with the intermittent motion of the crown-transporting wheel by hollow bosses or rims 92, Figs. 5, 8, and 9, depending from the lower side of the cork-carrier, to be engaged and driven by the teeth of the crown-transporting wheel. The cork disks feed by gravity, assisted by an overlying weight 93, to the cork-carrier, from a vertical tube 94, slotted on one side at 95, Fig. 8, to receive the finger-piece 93×, Fig. 5, of the sliding weight 93. The tube is supported by brackets 96 from the frame, which tube directs them to openings 97 in the top plate 98 of the cork-carrier, Fig. 9, said plate being approximately of the same thickness as the cork disk. The cork-carrier rotates about a post 99, fixed to the bed-plate by a clamp-screw 100 and dowel-pins, and secured to or formed with this post is a table 101, which extends into and is substantially inclosed by the cork-carrier. This stationary table lies directly beneath the top plate of the carrier, and it forms a rest or support for the cork disks as they are deposited in the openings 97 and while they are being moved step by step from the cork-supplying tube 94 in the direction of the arrow into position under the cork-assembling plunger at 88. At this point the stationary table has a vertical opening 102 (see Fig. 9) therein, and when a cork disk arrives at this opening it is forced down by the plunger 88 through the said opening and through the then adjacent hollow boss 92 of the cork-carrier and into the inverted crown lying beneath. The cork-carrier is provided with a cover 103, (omitted in Fig. 8,) held by the clamp-screw 100, said cover extending partly over the openings 97, except at the point beneath the cork-supply tube 94 and plunger 88, where the cover is recessed or notched in its edge, as at 94× and 88×, respectively, so that the cork disks may freely enter the openings 97; but when the carrier moves said disks will be carried under the edge of the cover and then held against displacement until they arrive under and are forced down by the plunger 88.

The parts of the composite sealing-cap have now been assembled, and in this condition they are carried from beneath the cork-assembling plunger 88 by intermittent movement into a position beneath a male die 104 and over a female die 105, which now coöperate to press the component parts intimately together, compress the sealing-disk and mechanically unite them by slightly contracting the vertical wall of the metallic cap or crown or by slightly reducing the diameter of the crown, so as to cause it to grip and hold the sealing disk or cork in place therein. The cork disks are originally flat; but when pressed into and united with the crowns they are of concavo-convex form, as shown in Fig. 4. The male die comprises a head 104, Figs. 4 and 5, attached to a plunger 106, which is screw-threaded into a socket in the slide 65, before described. Its face is slightly convex. The female die consists of a ring 105, having its upper inner edge slightly rounded, as shown in Figs. 4 and 5, and having an inner diameter slightly less than the outer diameter of the metallic crown to be shaped. The female die is set in a holder 107, bolted to the machine-bed and extending up into an opening 108 therein. Within the female die a plunger 109 is arranged, having its face of slight concave form. It is pressed normally upwardly by a spring 110, bearing against a flange 111 on the plunger and upon a plug 112, which is screw-threaded into the cavity of the die-holder, a jam-nut 113 holding the

plug in any position to which it may be adjusted to vary the tension of the spring. The action of the die mechanism will be clear from Figs. 4 and 5.

The assembled parts of the composite bottle-sealing cap are brought by the crown-transporting wheel so as to rest on the plunger 109, which normally has its upper face flush with the upper edge of the female die and the upper surface 86 of the machine-bed, Fig. 6. The male die now descends and enters the metallic crown, as shown in Fig. 4, pressing the parts into intimate contact and forcing them within the female die. This die is of slightly less diameter than the exterior diameter of the metallic crown forced into it, from which it results that the metallic crown is slightly reduced in diameter, but to a sufficient degree to cause the parts to be mechanically united by the gripping action of the wall of the metallic crown upon the sealing-disk, of cork or other material, and additional security against displacement of the cork disk is afforded by the concavo-convex form given to the cork disk by the dies, the resilience of the arched form of disk keeping its edges pressed against the wall of the crown. In this uniting action the female-die plunger 109 is depressed; but as soon as the male die rises the plunger 109 rises also under the action of its spring 110, and thus lifts the composite sealing-cap to the plane of the surface of the machine-bed. Any tendency of the composite sealing-cap to remain on the male die as the same rises is obviated by a stripper consisting of a sleeve 114, surrounding the die-plunger and having a pin 115, passing through a slot 116 in the plunger, (see Fig. 5,) a rod 117 bearing on the said pin at one end and at its other end being pressed upon by a spring in a cavity in the slide 65. The spring forces the stripper down with a yielding pressure, and the action of this part will be clear from Figs. 4 and 5. The composite sealing-cap having been raised to the level of the upper surface of the bed and back again into its pocket in the transporting-wheel, said wheel by its step-by-step rotary movements transports the composite sealing-cap to a discharge-opening 40 in the bed of the machine, through which the sealing-cap falls into any suitable chute or receptacle.

Referring now to details of driving mechanism and other detail features, the rotary crown-feeding table is driven constantly from the main driving-shaft through bevel-gears 118, Fig. 6, a vertical shaft 119, journaled in bearings 120, bevel-gears 121, a horizontal shaft 122, journaled in a bracket 123, fixed to the frame, and bevel-gearing 124, connected with the shaft 125, journaled in a bearing 126 on the frame and carrying the crown-feeding table. The intermittent rotary movement of the transporting-wheel is derived from the main driving-shaft through a worm 127 thereon, (see dotted lines, Figs. 5 and 7,) engaging a worm-wheel 128 on the shaft of the transporting-wheel. The worm has a straight portion or dwell at 129, and while this is engaging the worm-wheel the latter, together with the transporting-wheel, is at rest. The transporting-wheel acts as its own cut-off for the supply of crowns from the channel. When not feeding a crown, the feed-plate 25 simply rotates idly under the row of crowns in the channel. I provide an indicator or alarm device to give notice when the cork disks fail to feed into the cork-carrier. This comprises an arm 130, Fig. 8, pivoted to the frame at 131 and having a depending finger 132 to rest on the cork disks lying in the openings 97 of the cork-carrier. When an empty opening passes beneath the finger, the arm 130 will drop therein, and thus turn on its pivot, so that its other arm $130^{\times}$ will rise and make contact with an electric contact point or finger 133, thus closing an electric circuit including a suitable alarm.

While I have described and shown the composit sealing-cap as made up of three elements, I do not wish to limit myself in this regard, as in some instances the caps are composed of only the metal and the sealing medium, either in the form of a disk, as usually preferred, or in the form of a flat or molded ring of cork or other elastic material.

In providing the impervious collet I find it most convenient to feed a strip of paper to the dies, which first cut the collet and then deposit it within the metal cap; but if the collets be first cut and fed to the metal caps one by one it will involve no departure from certain features of my invention, the paper cutting and controlling means being in appropriate organization with the cork feeding and setting mechanism.

The uniting of the component parts of the sealing-cap involves, essentially, the use of pressure, to which the parts are subjected, and this may be secured in different ways and may be used alone or form one of a plurality of actions intended to securely unite the parts.

Where I employ the term "assembling" in the accompanying claims, I do not necessarily mean that the parts are placed in actual contact with each other first and are then united by a different action of the machine or by a set of elements entirely separate and distinct from those used in assembling. It is sufficient for the purposes of my invention that the component parts be brought in such relation to each other or assembled that they may be forced together and united.

I claim—

1. In apparatus for making composite closures, the combination of assembling means for the caps and the other part or parts including a transporting wheel or disk, a supply-hopper for the caps, means for automatically feeding the caps from said supply-hopper to rest on the surface of the transporting

wheel or disk and a guideway along which the caps are moved by the transporting-wheel.

2. In combination in apparatus for making composite closures, means for assembling the caps with the other part or parts of the closure including a rotary cap transporting or carrier wheel or disk, a second rotary transporting or carrier disk arranged to receive the caps from the first disk and means for automatically delivering caps to the first carrier or transporting wheel, substantially as described.

3. In combination in apparatus for making composite closures, a hopper for the caps, means for assembling the caps with the other part or parts of the closure including a cap transporting or carrier wheel, a chute interposed between the hopper and the transporting-wheel, and means at or near the discharge end of the said chute for controlling the feed of said caps to the said wheel, substantially as described.

4. In combination in apparatus for making composite closures, means for assembling the caps with the other part or parts of the closure and a plurality of automatic feeds to supply caps to the said assembling means, said automatic feeds acting alternately in respect to each other substantially as described.

5. In combination in apparatus for making composite closures, means for assembling the caps with the other part or parts of the closure, a plurality of chutes leading to the said means, and means for causing the feed of the caps to take place from said chutes alternately, substantially as described.

6. In combination in apparatus for making composite closures, means for acting on the caps, and a plurality of feed-chutes with means controlling the feed of caps from the chutes alternately adapted to permit one chute to be filling up while the other chute is discharging, substantially as described.

7. In combination in apparatus for making composite closures, means for assembling the caps with the other part or parts of the closure, a plurality of feed-chutes and means for controlling the feed through each chute, said means being in turn controlled by the feed of the caps from the other chute, substantially as described.

8. In apparatus for making composite closures, and in combination, means for assembling the caps with the other part or parts of the closure, a plurality of feed-chutes, a stop-pin in each chute and means for controlling the stop-pin of one chute, said means extending into the other chute, substantially as described.

9. In apparatus for making composite closures, and in combination, means for assembling caps, collets and sealing-disks leaving the sealing-disks exposed within the cap, and means for supplying said component parts automatically to the assembling means, substantially as described.

10. In machinery for making composite bottle-sealing closures, means for assembling sealing disks and caps combined with means for uniting them and leaving the disks exposed within the caps, substantially as described.

11. In machinery for making composite bottle-sealing caps, means for assembling the sealing-disks and said caps leaving the sealing-disks exposed within the cap, combined with means for uniting said parts under pressure, substantially as described.

12. In machinery for making composite bottle-sealing caps, consisting essentially of a metal cap and a disk of compressible material, means for assembling the cap and disk and means for compressing the disk and uniting it with the metal cap, substantially as described.

13. In machinery for making composite bottle-sealing caps, means for assembling a metal cap or crown, forming one of the component parts of the said sealing-cap, with another component part thereof composed of compressible material, and means for subjecting the said assembled parts to pressure and for pressing inwardly the wall of the metal crown into gripping contact with the edge of the compressible component part lying within the said cap, substantially as described.

14. In machinery for making composite bottle-sealing caps, and in combination, means for assembling the component parts of the said caps and die means independent of the assembling means for uniting the said parts, substantially as described.

15. In machinery for making composite bottle-sealing caps and in combination, means for supporting a metal cap constituting one of the component parts in inverted position, means for depositing therein another of the component parts of said sealing-cap and means for uniting the said parts under pressure leaving the inner part exposed, substantially as described.

16. In machinery for making composite bottle-seals, means for assembling a metal cap and an exposed compressible sealing medium and means for pressing the said parts together and uniting them and giving a concavo-convex shape to the compressible medium, substantially as described.

17. In machinery for making composite sealing-caps, and in combination, means for assembling the component parts, a plunger having a convex face, a die, and a die-plunger having a concave face for forcing one part into contact with the other, substantially as described.

18. In machinery for making composite sealing-caps, and in combination transporting means for one of the parts, carrier means for

another part and a plunger for forcing one part into contact with the other when said parts arrive opposite each other, substantially as described.

19. In machinery for making composite sealing-caps, and in combination, means for assembling the component parts comprising rotary transporting and rotary carrying devices, and means for uniting the component parts, substantially as described.

20. In machinery for making composite sealing-caps, and in combination, a rotary transporting-wheel for one of the component parts, a rotary carrier for another part overlying the transporting-wheel, a plunger for forcing one part within the other and die means for uniting the parts, substantially as described.

21. In machinery for making composite bottle-seals, and in combination, means for transporting metal caps or crowns in inverted position to the point of assembling with another part, means for carrying said other part to the said point, means for placing said other part within the inverted cap and means for uniting the parts leaving the inner part exposed, substantially as described.

22. In combination, means for transporting metallic crowns in inverted position, plunger means for placing a sealing medium therein and die means for uniting the said parts and leaving the sealing medium exposed, substantially as described.

23. In combination, in machinery for making composite bottle-seals, a toothed transporting-wheel for the crowns, a carrier for the sealing-disks, a plunger for forcing the sealing-disks into the crown and a pair of dies to which the transporting-wheel moves the crown with its sealing-disk, substantially as described.

24. In combination, in machinery for making composite bottle-seals, a toothed transporting-wheel for the crowns, a carrier for the sealing-disks having hollow bosses to be engaged by the teeth of the said toothed transporting-wheel, and a plunger for forcing the disks through the said hollow bosses into the crowns, substantially as described.

25. In combination, in machinery for making composite bottle-seals, a transporting-wheel with means for rotating the same intermittingly, a crown-feeding plate constantly rotating, a carrier for the sealing-disks moving in unison with the transporting-wheel and means for forcing the sealing-disks and crowns together, substantially as described.

26. In combination, in machinery for making composite bottle-sealing caps, an intermittingly-operated crown-transporting wheel having pockets in its periphery, a constantly-rotating crown-feed plate operating in a lower plane than the transporting-wheel, to deposit crowns in the said pockets, a cork-carrier operating in a plane above that of the crown-transporting wheel, a plunger for transporting the cork to the crown and die means for uniting the parts substantially as described.

27. In combination, means for transporting crowns in inverted position, means for placing sealing media therein, and upper and lower dies to which the transporting means conveys the parts to be united and from which the said transporting means moves the united parts, substantially as described.

28. In combination, a crown-transporting wheel, a cork-carrier comprising a rotary part having openings or recesses to receive the corks, a table over which the rotary part moves, said table having an opening at one point in the line of movement of the openings in the rotary part and a plunger operating in line with the opening in the table to move the cork from the carrier into the crown, substantially as described.

29. In combination in machinery for making composite bottle-seals, means for assembling a metal crown or cap, an impervious collet and a sealing medium, and means for uniting said parts including upper and lower dies independent of the assembling means, substantially as described.

30. In combination in machinery for making composite bottle-seals, means for cutting collets from a strip, means for assembling metal crowns and sealing means with said collets and means for uniting the said parts, substantially as described.

31. In combination, cutting means for the impervious collet, means for directing the strip of material thereto, means for transporting the crowns in inverted position into position under the collet-cutting means, to receive the collets therefrom and means for forcibly placing the sealing mediums upon the collets and to which placing means the crowns are moved by the transporting means, substantially as described.

32. In combination, cutting means for the collets, a transporting-wheel for the crowns rotating intermittingly, and a feed-roller for the collet-strip to press said strip upon the transporting-wheel to be fed intermittingly thereby.

33. In combination, in machinery for making composite sealing-caps, a crown-transporting wheel having pockets in its periphery adapted to receive the crowns, means for cutting component parts of said sealing-caps to be associated with the crowns, said means being located over the line of movement of the pockets, and a feed-roller coacting with the upper surface of the transporting-wheel to feed the material to the cutting means, substantially as described.

34. In combination, in apparatus for making composite closures, assembling means for the component parts including a wheel having

teeth forming recesses for the caps, and means for feeding the caps automatically to the said wheel, substantially as described.

35. In combination, a toothed transporting-wheel for the crowns, a channel leading to the periphery of the said wheel, a constantly-rotating crown-feed plate forming the bottom of the channel, said toothed wheel acting as a cut-off device for the supply of crowns fed thereto, and means for associating with the crowns the component parts of the sealing-caps, substantially as described.

36. In combination, means for assembling metal crowns and cork disks including a cork-disk carrier having openings extending therethrough from top to bottom, means for uniting the said parts, including a plunger to pass down through the openings in the carrier to force the cork disks into the crowns, and an alarm-indicator to give notice when an opening in the cork-carrier is empty, said indicator comprising a member to fall into the openings, the movement of the cork-carrier bringing the said openings to the alarm device in succession, substantially as described.

37. In combination, in machinery for making closures for bottles, assembling means, a plurality of chutes leading thereto, and a plurality of feed means for the caps at or near the discharge ends of the chutes operating alternately to deliver said caps to the assembling means, substantially as described.

38. In combination assembling means for the caps and another part or parts of the closure, a plurality of chutes leading thereto and means located near the discharge end of the chutes for controlling the discharge of the caps therefrom, substantially as described.

39. In combination means for assembling the cap with the other part or parts of the closure, a plurality of feeds and pins or fingers arranged to engage the caps with means for operating the said fingers, substantially as described.

40. In combination assembling means for assembling the cap with the other part or parts of the closure, a plurality of chutes leading to the assembling means with means for supplying the chutes with caps and pins or fingers extending into the chutes with means for operating the said fingers to control the feed, substantially as described.

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

WILLIAM H. WHEELER.

Witnesses:

HARVEY COALE,

JOHN BLACK.