(No Model.) 4 Sheets—Sheet 1.

W. PAINTER.

MACHINE FOR INSERTING WIRE LOOPS IN BOTTLE SEALS, &c.

No. 438,712. Patented Oct. 21, 1890.

Fig 1.

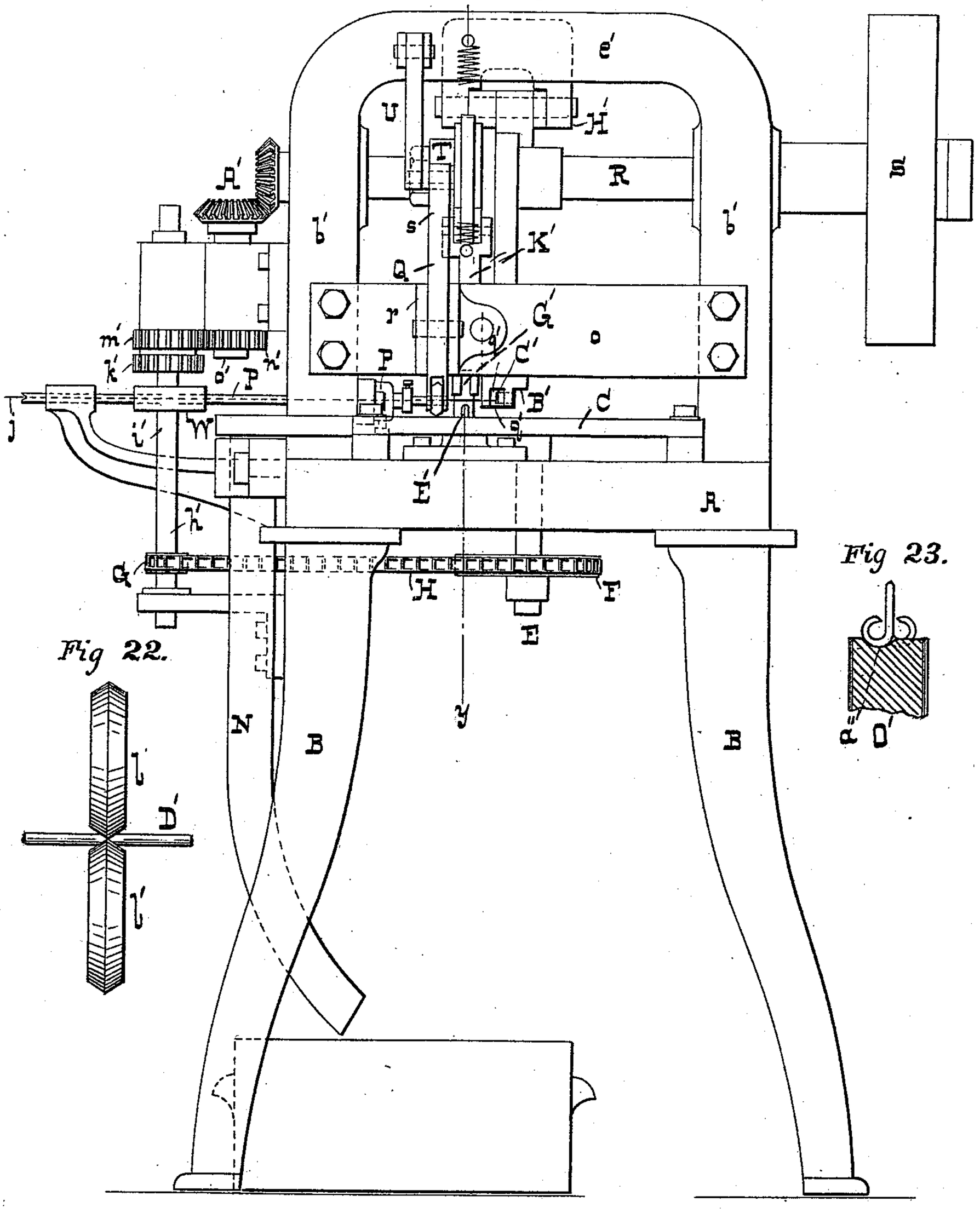

Fig 22.

Fig 23.

Witnesses

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R. Macdonald.

Inventor

William Painter,

By his Attorneys

Geo. W. I. Howard.

(No Model.)

4 Sheets—Sheet 2.

W. PAINTER.

MACHINE FOR INSERTING WIRE LOOPS IN BOTTLE SEALS, &c.

No. 438,712. Patented Oct. 21, 1890.

Fig 2.

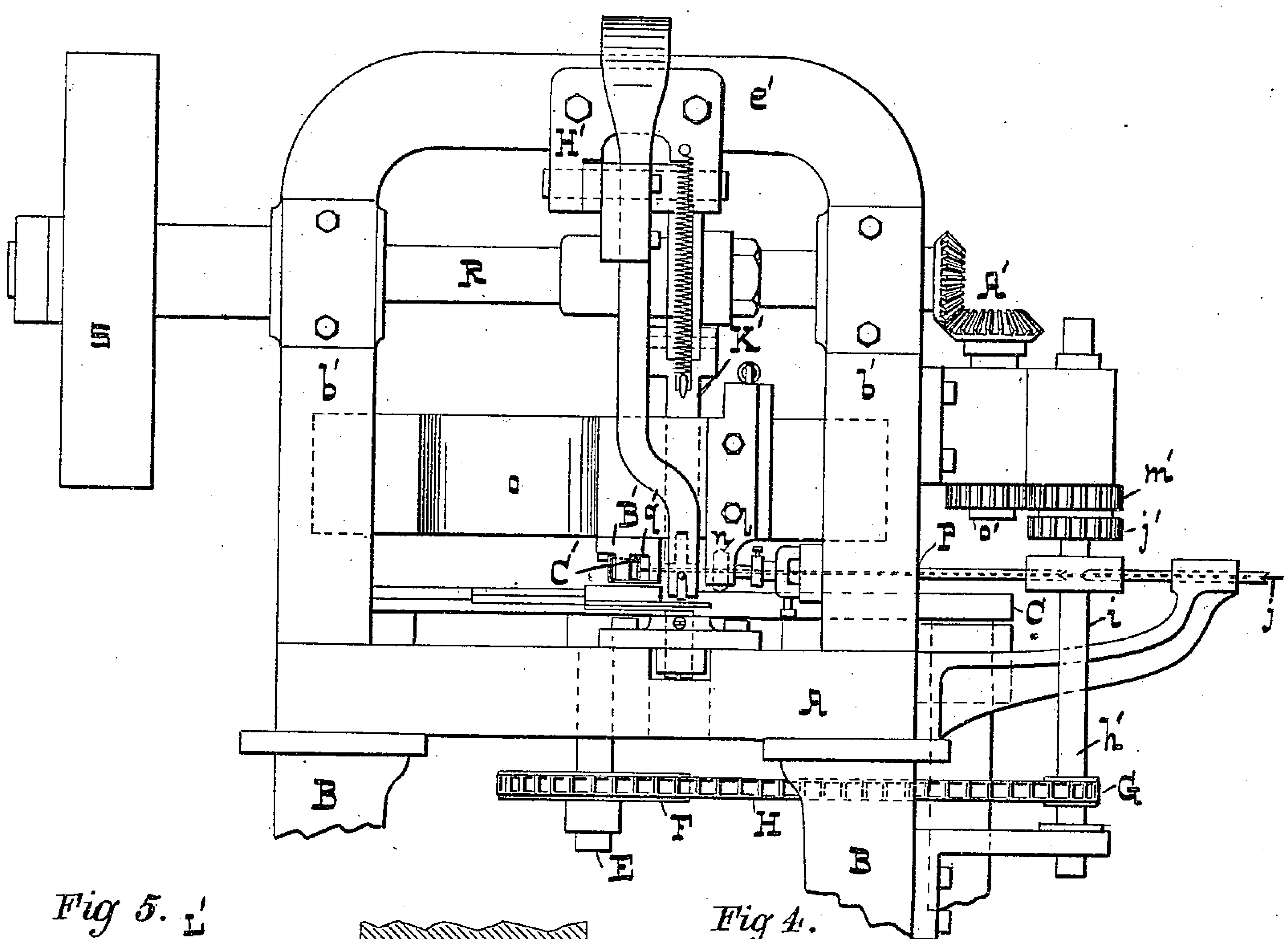


Fig 5.

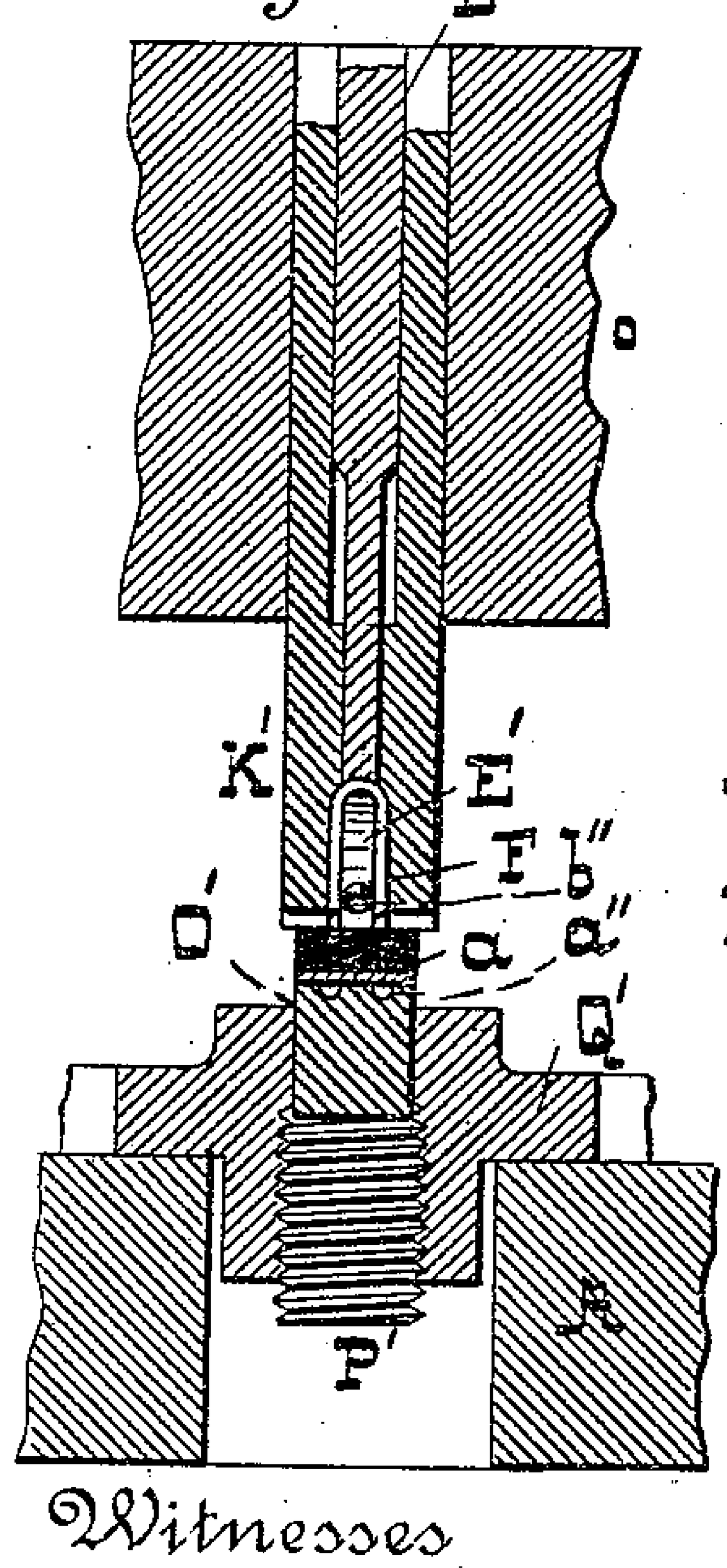
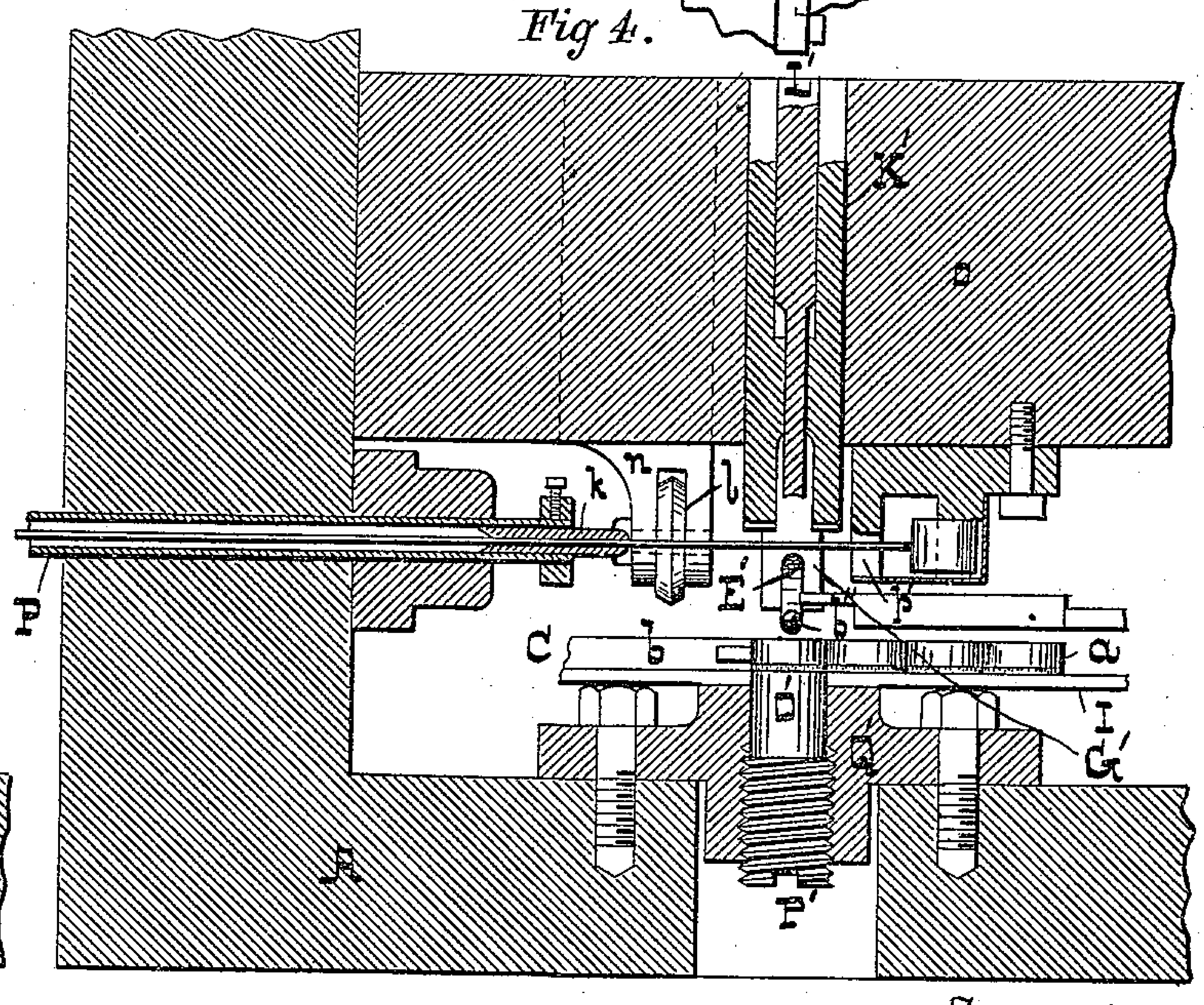


Fig 4.



Witnesses

Edward A. Dose,

[illegible]

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(No Model.) 4 Sheets—Sheet 3.

W. PAINTER.

MACHINE FOR INSERTING WIRE LOOPS IN BOTTLE SEALS, &c.

No. 438,712. Patented Oct. 21, 1890.

Fig 3.

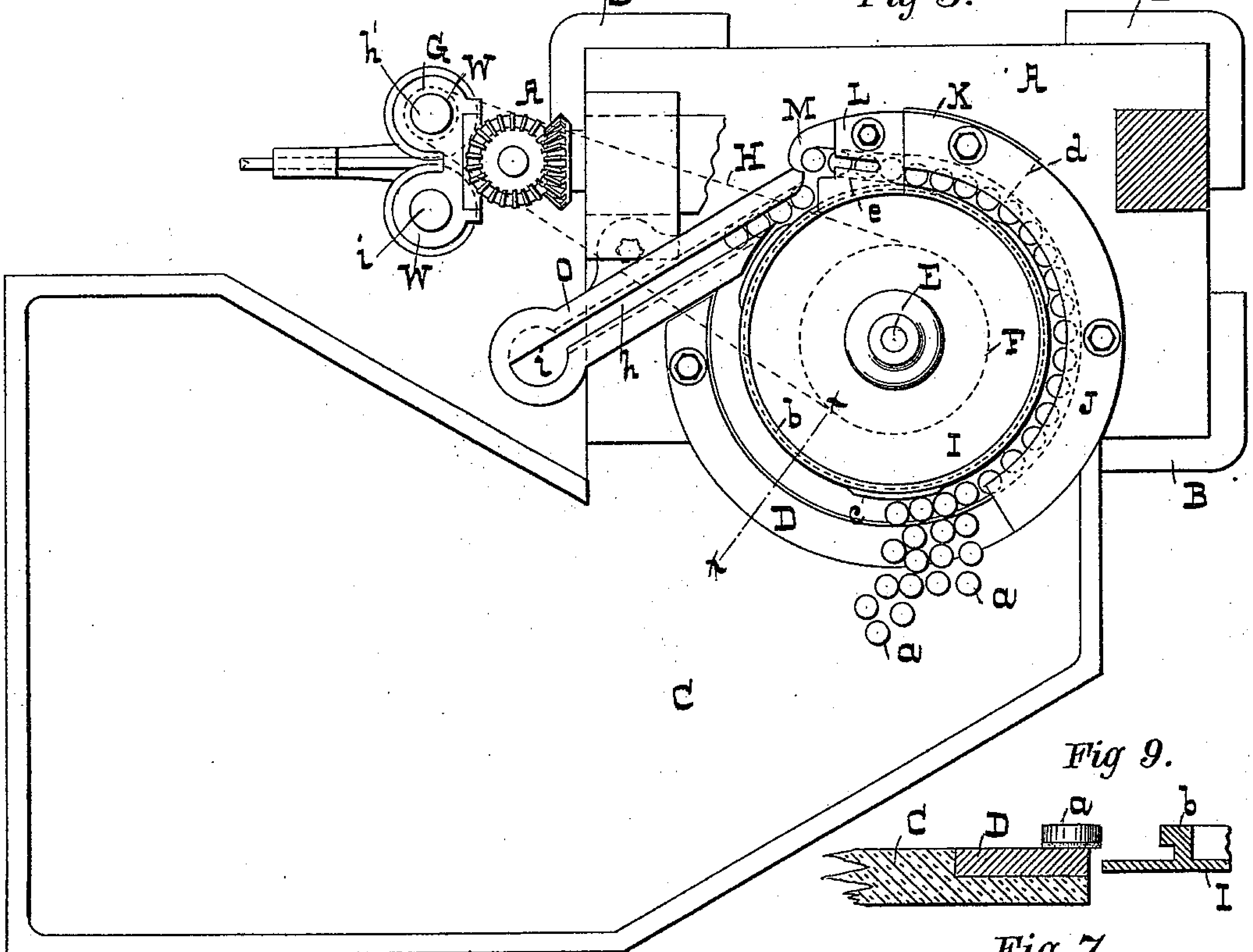
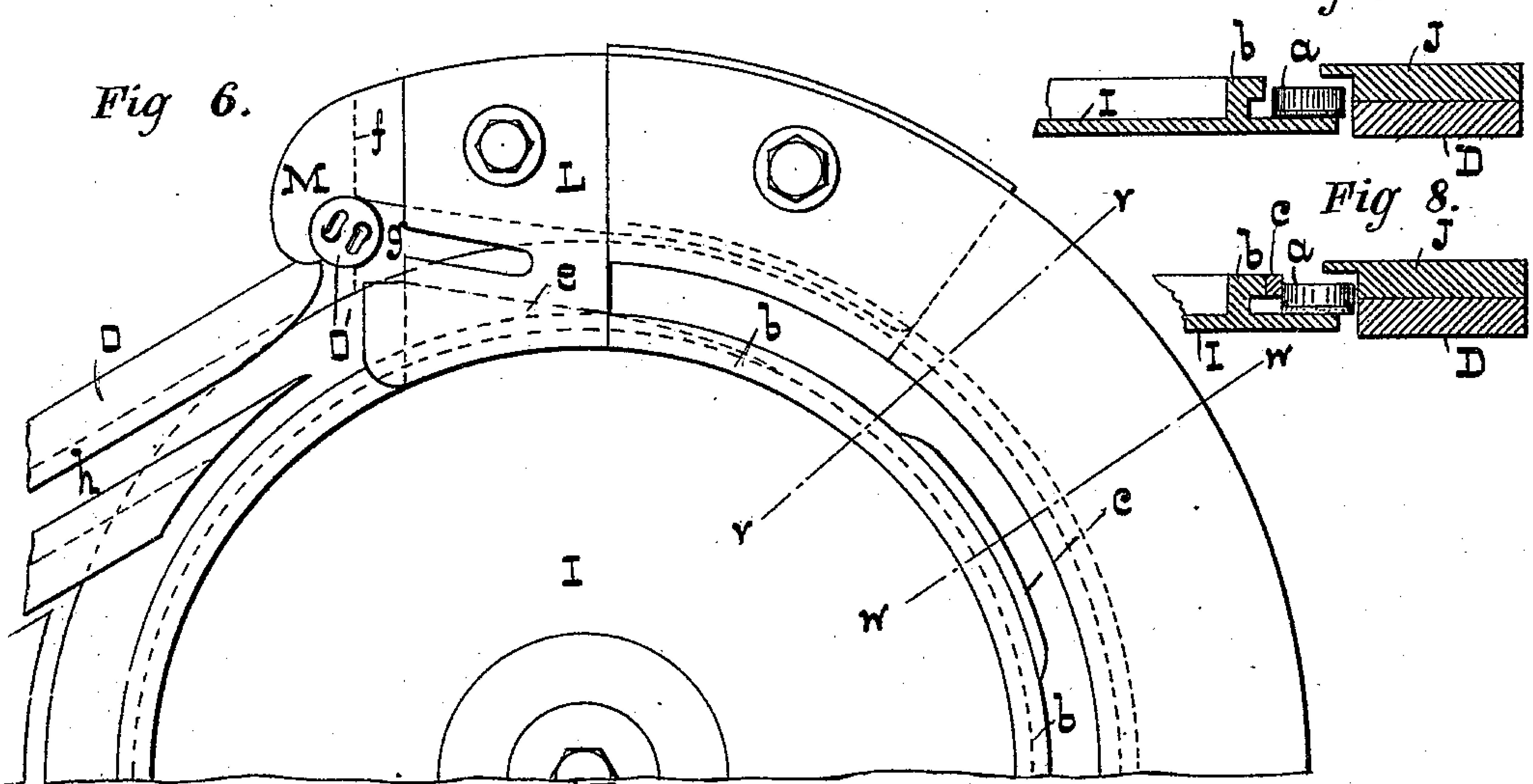


Fig 9.

Fig 7.

Fig 8.

Fig 6.



Witnesses

Edward A. Osse,

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By his Attorneys

(No Model.) 4 Sheets—Sheet 4.

W. PAINTER.

MACHINE FOR INSERTING WIRE LOOPS IN BOTTLE SEALS, &c.

No. 438,712. Patented Oct. 21, 1890.

Fig 11.

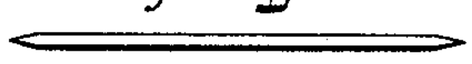


Fig 10.

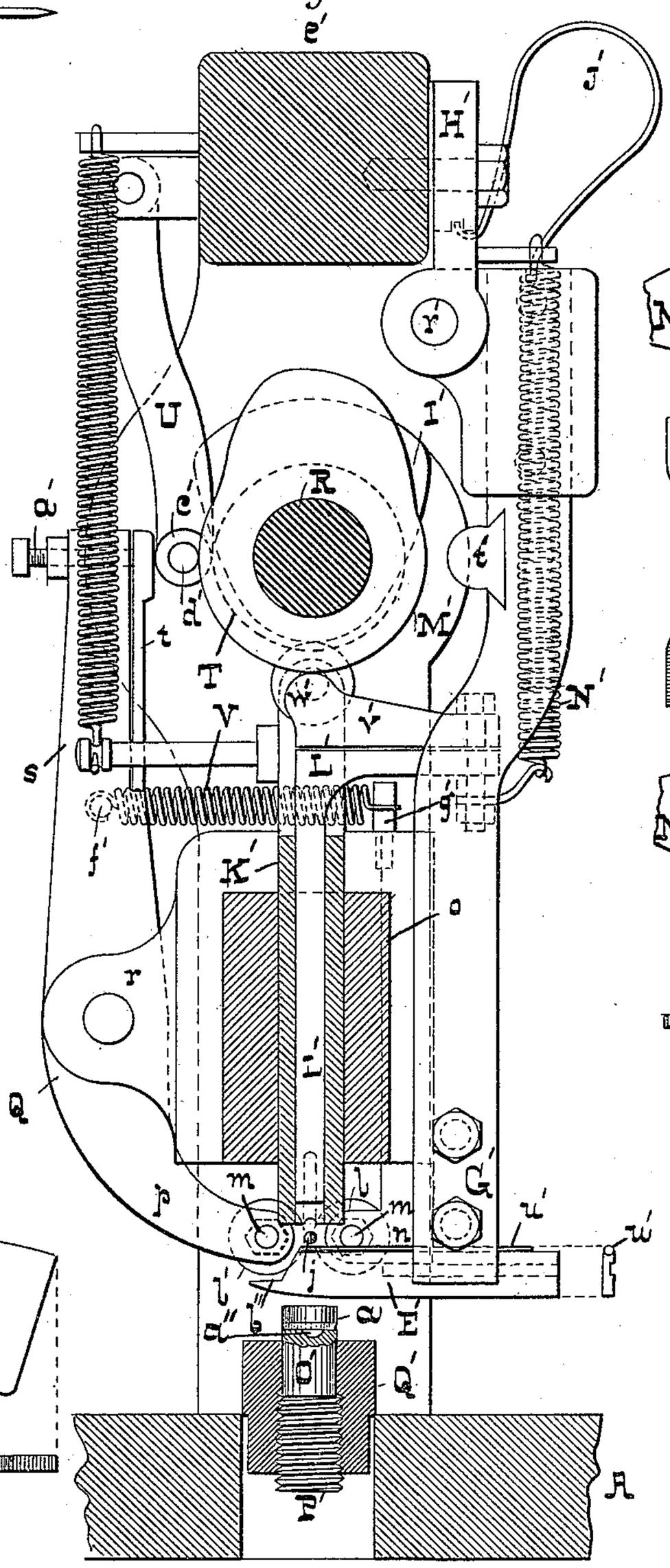


Fig 12.

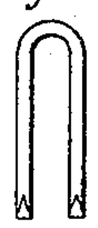


Fig 13.

Fig 19.

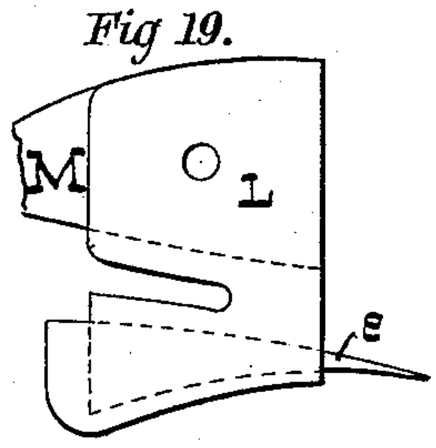


Fig 20.

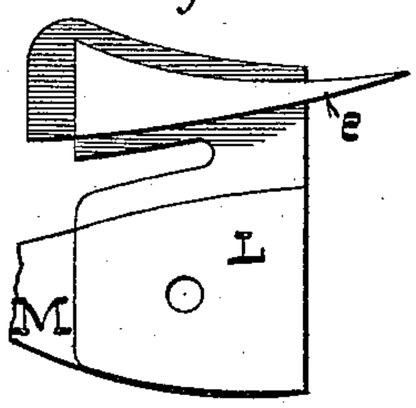


Fig 21.

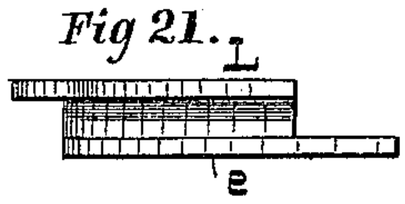


Fig 14.

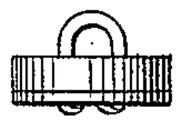


Fig 15.

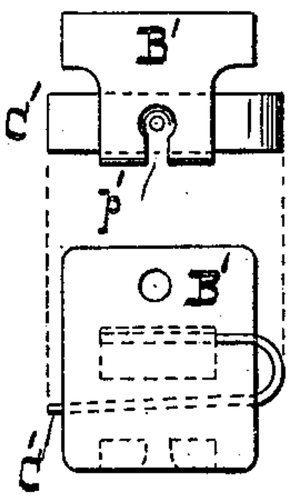


Fig 16.

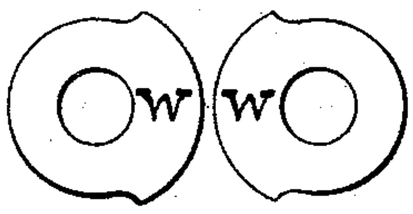


Fig 17.

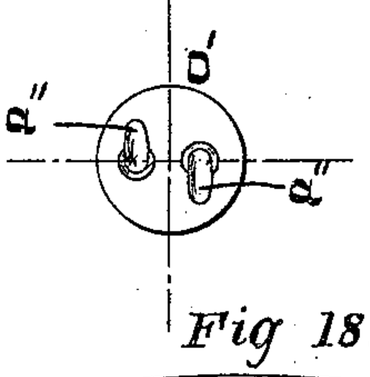
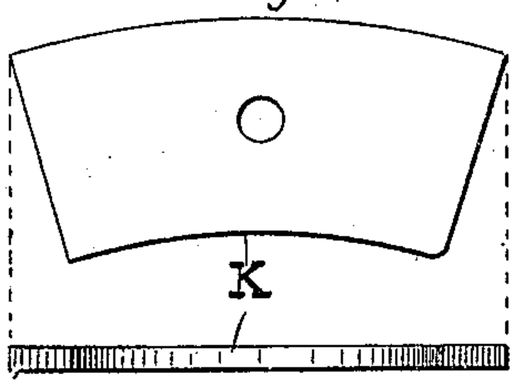


Fig 18.



Witnesses

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Inventor

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UNITED STATES PATENT OFFICE.

WILLIAM PAINTER, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE BOTTLE SEAL COMPANY, OF SAME PLACE.

MACHINE FOR INSERTING WIRE LOOPS IN BOTTLE-SEALS, &c.

SPECIFICATION forming part of Letters Patent No. 438,712, dated October 21, 1890.

Application filed March 7, 1890. Serial No. 342,968. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM PAINTER, of the city of Baltimore and State of Maryland, have invented certain Improvements in a Machine for Inserting Wire Loops in Bottle-Seals, of which the following is a specification.

This invention relates to certain improvements in a machine whereby a loop is attached to a bottle-seal to admit of its removal from the bottle-neck. The seal and the bottle adapted for its reception are shown in Letters Patent No. 327,099, granted to me on the 29th day of September, 1885, and the seal fitted with the loop in application, Serial No. 342,967, now pending, to which Letters Patent and pending application reference should be had.

In the machine hereinafter described the leading distinctinctive operations consist in feeding the seal-disks to a certain place or point where the loop is to be applied, in drawing the wire from a coil and cutting it into lengths or wire blanks with sharpened ends, in bending the wire blank into the form of a staple, in forcing the staple through the seal, in inverting the sharpened ends of the staple within the substance of the seal in opposite directions and turning them around and backward toward the straight portions of the staple or loop, and, finally, in conducting the completed seal from the place where the loop is attached, so as to make room for the next uncompleted seal.

In the description of the said machine which follows reference is made to the accompanying drawings, forming a part hereof, and in which—

Figure 1 is an exterior front elevation of the machine, and Fig. 2 a reverse view of the upper portion of the same. Fig. 3 is a top or plan view of the machine with certain parts thereof removed. Fig. 4 is a vertical section, on an enlarged scale, of certain parts of the machine immediately adjacent to the wire-feeding mechanism, illustrating the means whereby the loop-blank is cut from the wire, bent over a former into the shape of a staple, and forced through the seal. Fig. 5 is a section of Fig. 4, taken on the dotted line *u u*, except that the blank is shown in the form of a staple and about to be driven through the seal. Fig. 6 is an enlarged plan view of a portion of the table and some of the adjacent parts thereof, illustrating the devices for feeding the seals to and from the point where the loops are affixed. Figs. 7 and 8 are sections of Fig. 6, taken, respectively, on the dotted lines *v v* and *w w*. Fig. 9 is an enlarged section of Fig 1, taken on the dotted line *x x*. Fig. 10 is an enlarged section of Fig. 1, taken on the dotted line *y y*. Fig. 11 is an enlarged view of the wire loop-blank, and Fig. 12 a similar view of the same after it is bent into the form of a staple. Fig. 13 is a view of the loop after its completion and as it would appear if cut from the seal. Fig. 14 is an enlarged side view of the completed seal. Figs. 15, 16, 17, 18, 19, 20, 21, 22, and 23 are details of the machine, which will be described hereinafter.

Similar letters of reference indicate similar parts in all the figures.

Referring to the said drawings, A represents the frame of the machine supported by suitable legs B.

C is a table secured to and projecting from the front of the frame upon which the seals to be provided with loops are placed, (see Fig. 3,) which shows some of the seals scattered over the table.

D is a ring, or more properly speaking a mutilated ring, as it is not complete, which forms a part of the table, and its upper surface is flush or fair with that of the table. A top view of this ring is shown in Fig. 3.

E is a vertical shaft (shown particularly in Figs. 1, 2, and 3) adapted to revolve in suitable bearings in the frame A. To the lower end of this shaft is secured a sprocket-wheel F, which derives its movement from a smaller sprocket-wheel G through the medium of a chain belt H. The means for driving the shaft of the smaller sprocket-wheel will be hereinafter described. These sprocket-wheels and the chain belt are fully illustrated in Figs 1 and 2, and the said belt is denoted by a dotted line in Fig. 3.

To the upper end of the shaft E is attached a feeding-disk I for the seals *a*, which consists, essentially, of the plate, the overhanging rim *b*, situated some distance from the circumference of the disk, and the bumpers *c*,

hereinafter fully described. The upper surface of the annular portion of the disk, or that part thereof which is exterior of the rim *b*, is sunk below the surface of the table C, and the ring D, which forms a part thereof, as shown on an enlarged scale in Figs. 7, 8, and 9. Upon this sunken annular rotative surface are placed the seals *a* to be conducted to the devices for attaching the loops. Some seals are shown in Fig. 3, as in the sunken channel, or, in other words, on the annular feeding-surface of the disk I.

J is a segmental plate bolted to the upper surface of the ring D to partly cover the annular part of the feeding-disk, and thereby prevent the seals from jumping out as fed to the loop-attaching devices. A cross-section of this segmental plate is shown in Figs. 7 and 8. The segmental plate at one of its ends is notched, as shown by a dotted line *d*, Fig. 3, to admit of its covering the fixed segmental bumper K. (Shown by itself in Fig. 18.) The inner edge of this bumper K is slightly within the inner edge of the ring D, as shown by the dotted lines in Fig. 6, so as to contract the width of the annular channel, for a purpose hereinafter described.

The end of the segmental plate J abuts against a plate L. (Shown in Figs. 3 and 6, and separately in Figs. 19, 20, and 21, which are, respectively, a top, an under side, and an edge view of the same.) A projecting triangular part of the plate L is of such thickness as to admit of its being inserted under the overhanging portion of the rim *b* of the disk I, and thereby form a switch *e* to deflect the seals fed thereto to a hook M, also forming a part of the said plate. The inside curvature of this hook corresponds with the circumference of the seals *a*. Consequently when a seal is seated in the hook and backed up by others it is held firmly while the loop is being applied.

The extreme end of the mutilated ring D is designated by the dotted line *f* in Fig. 6, and it will be understood that the surface of this ring at the point *g* is flush or on the same plane with the upper surface of the annular portion of the feed-disk I, in order that the seals may pass to the hook M without meeting with any surface obstruction.

Referring to Fig. 6, in which switch *e* is shown in dotted lines, it will be seen that the point of that device passes under the overhanging rim *b* of the disk I, as before stated. The object of this arrangement is to prevent the seals from striking the point of the switch.

The disk I is provided with three of the bumpers *c*, before alluded to, and these consist of segmental strips with inclined or tapered forward ends secured to the circumference of the rim *b*, and they are of such thickness that when they pass or come opposite the stationary bumper K the space between the two bumpers is contracted to a width slightly less than the diameter of the seals, and the seals are therefore driven forward toward the switch and thence to the hook with a decided force and the forward or end seal pressed into the hook and held therein during the operation of inserting the loop, as hereinafter described; but it will be understood that the lengths of the rotary and the fixed bumpers are such that at the completion of the loop the rotary bumper has passed the fixed one, and until the arrival of the next rotary bumper opposite the fixed one the seals are released from any positive movement, and are held loosely together by the rotation under them of the feeding-disk. The object of this momentary release of the seals from a positive forward movement is to admit of the removal of the completed seal from the hook and its transfer to a channel *h*, along which the completed seals are pushed until they reach an opening *i*, which communicates with a chute N. This chute is shown only in Fig. 1; but the channel is represented also in Fig. 6. The channel *h* is formed by grooving a bar O longitudinally thereof and providing it with a hole *i*, leading to the chute.

P is a tube secured in the side of the frame A, through which wire *j* from a coil (not shown) passes. It is fitted with a tip *k*, somewhat contracted in diameter, which centers the wire, and in connection with devices hereinafter described holds it firmly while the blank is being cut off. The tip is shown in Fig. 4. Directly in the rear of the wire is a cutter *l*, which consists, preferably, of a steel disk with a sharpened edge. This cutter is held by a central spindle *m* in a hanger *n*, dependent from the cross-piece *o* of the frame A. Another and similar cutter *l'* is situated in the short arm *p* of the lever Q, which is pivoted to a bracket *r* on the front of the said cross-piece of the frame A. The end of the long arm *s* of the lever Q has a facing-piece *t*, adjustable in projection beyond its face by means of a set-screw *a'*, as shown in Fig. 10.

R is the driving-shaft of the machine, journaled in the upright parts *b'* of the frame A and provided at its outer end with a driving-pulley S. On this shaft is a cam T, and between this and the adjustable face of the lever Q is a roller *c'* on a stud *d'*, extending from the side of an arm U, pendent from the upper cross-piece *e'* of the frame.

A spring V, attached at one end to a stud *f'* on the lever Q and at the other end to a second stud *g'* on the cross-piece *o* of the frame A, serves to yieldingly hold the facing-piece *t* of the long arm *s* of the lever Q in contact with the roller *c'* and the latter in contact with the face of the cam T. (See Fig. 10.) At each revolution of the cam T the movable cutter or disk *l'* is brought up to the stationary one *l* and the wire between them cut or pinched off, and the blank is thus provided with a chisel-shaped point, as shown in Fig. 11, which illustrates the blank alone.

Although the cutting-disks are circular and on spindles, they are not revoluble in the true sense of the term, but stationary, they being

clamped between the jaws which hold them by means of nuts on the spindles. They may, however, be changed in position, so as to present new cutting-edges to the wire when worn, by first slackening the nuts and then turning them slightly around. After they are changed in position they are again clamped.

The wire is fed intermittingly through the tube P and between the cutting-disks l and l' by means of two mutilated rollers W, one of which is on the shaft h' and the other on a similar shaft i', connected to the first by the spur-gears j' and k'. Another spur-gear m' on the shaft i' is in mesh with a similar gear n' on the vertical shaft o', and this shaft is driven from the driving-shaft R of the machine by means of the miter-gears A′.

The above-described gears and the mutilated rollers are constructed and arranged so that at each full revolution of the said mutilated rollers and one-third of a revolution of the seal-feeding disk a piece of wire projecting from the wire tube is cut off, the same being of the proper length from which to form a loop for a seal. The end of the wire before it is cut off is projected through a vertical slot p' in the block B′, which is secured to the under side of the cross-piece o of the frame A and compresses or moves inward the free end of a spring C′, secured in a cavity q' in the said block. An additional compression or movement of the said spring is effected by the elongation of the wire blank D′ by the pinching action of the sharpened disk-cutters thereon, which produces the chisel-pointed ends before alluded to. The upper end of the slot p' is countersunk, as shown in Figs. 4 and 15, to guide the wire thereto. After the wire blank is cut off its inner end is held by the resiliency of the spring C′ closely in contact with the faces of the cutters and in a proper position to be acted on by the bending devices, hereinafter described.

E′ is the former, over which the wire blank D′ is bent into the form of a staple F′ (shown in Figs. 5 and 12) and fitted for insertion through the seal held within the hook M. This former consists of a blade of suitable width and of a thickness practically the same as the width of the staple or the distance between the two parts thereof. It is secured to the end of a lever G′, which is pivoted or fulcrumed at r' to a bracket H′, bolted to the rear side of the upper cross-piece e' of the frame. A lug t' on the face of the lever is held in contact with the face of the cam I′ by the resiliency of a U-shaped spring J′, the ends of which are attached to the bracket H′ and to the upper end of the lever G′. (See Fig. 10.)

The former-blade and its attachments are so arranged that in the extreme forward movement of the former-blade its upper edge is brought under and in contact with the wire with its end slightly forward of the same, as shown in Fig. 10, and in order that the former-blade may rise slightly as it passes under the wire the pivotal point r of the lever G′ is thrown back of the vertical center line of the wire, as shown. This lifting of the former-blade as it passes under the wire blank is desirable for the reason that its upper edge should be brought in contact with the under side of the wire, and this could not be accomplished with an absolutely straight wire and a horizontally-moving former-blade without tending to deflect the wire forward, and, further, it is impossible to insure every wire blank being absolutely straight or free from such downward curvature as would interfere with the passage under it of a former-blade moving in a straight line or horizontal plane.

K′ is a plunger adapted to have a vertical reciprocating movement in the cross-piece o of the frame directly over the seal held within the hook M. The lower end of this plunger is bifurcated, so as to straddle the former-blade, as shown in Figs. 1, 4, and 5, and the two parts or branches are hollowed at the bottom where they strike the wire blank, as shown in Fig. 10, to prevent the wire glancing when the plunger comes in contact with it. The said branches are also grooved on the inner side, as shown in Figs. 4 and 5, to accommodate the wire staple, the two parts of which pass between them and the former-blade when the plunger descends, as shown particularly in Fig. 5, in which a staple is shown. As there is considerable wear on the upper edge of the former-blade where the staples are bent over it, the said edge is made hollow or grooved, and a cylindrical pin u' is inserted in the groove or channel and projects, and thus forms the edge proper, as shown in Fig. 10. This pin when worn may be moved endwise and a new unworn part thereof presented to the wire.

A second plunger L′, adapted to have a vertical movement in the first one, which is made hollow for the purpose, is shown particularly in Figs. 4, 5, and 10. This second plunger is for the purpose of forcing the wire staples through the seals. In order that this plunger may not change the shape of the crown of the staple, its lower end is made hollow and to fit the staple, as shown in Figs. 4 and 5. The upper end of this plunger is provided with a cap-piece V′, having a lug w' of hardened steel, which is held in contact with a cam M′ on the main driving-shaft R by means of a spring N′, as shown in Fig. 10. When the lug becomes worn, the cap-piece is raised by the insertion of a suitable liner beneath it. The stroke of the plunger is such as to force the staple through the seal and invert its ends, which are spread in opposite directions and turned around and back toward the straight parts of the wire, as before stated, and hereinafter more particularly described.

The means whereby the pointed ends of the wire staple are inverted and otherwise bent, as described, consists in a cylindrical die O′, which rests on an adjustable screw P′ in a

seat Q′, secured to the frame of the machine. (See Figs. 4, 5, and 10.) In the top of the die are two curved pits or channels a'', each with a rounded bottom, placed side by side, and at a distance apart equal to the distance between the straight parts of the wire loop. Both pits begin on a diametrical line of the die, but extend in opposite directions from the center line, and in order that the ends of the wire may enter the pits in every instance the entering ends thereof are countersunk, as shown in Fig. 17. This die constructed as described is placed directly under the hook, and the pointed ends of the staple having passed through the seal enter the curved pits and pass around, following their curvature, and, owing to the length of the wire blank and the stroke of the plunger being properly regulated, the curving of the ends of the staple is continued after the ends leave the pits, and they assume the shape shown in Figs. 13 and 23. The outer end of the former-blade is provided with a point b'', which as the former-blade comes forward to receive a wire blank which is to be bent thereon enters the loop of the last-completed seal and lifts it from the die and deposits it again on the annular part of the feeding-disk I, by means of which it is carried to the channeled bar O, from which it finally drops to the chute N. This channel is of such length as to expose a large number of seals to view, which enables the attendant to detect and remove any defective ones.

It is evident that in carrying the completed seal from its position within the hook in the manner described it must be moved slightly back or in a direction the reverse of that taken in the feeding-operation to clear the point of the hook; but to admit of this backward movement the incoming seals must be loose, or under no decided pressure, or they could not be moved or started back collectively. It is for this reason that the seals are only intermittingly fed with force by means of the co-operation of the moving and the stationary bumpers, as before described.

Supposing the wire fed to the machine to be pointed and the pointed end at the cutting-edge of the stationary disk-cutter, the other or movable cutter to be at or near to its greatest distance from the fixed one, the former-blade to be back or from under the wire, the two plungers partially elevated, the seals distributed loosely along the annular part of the feeding-disk with the first one approaching and at a short distance from the hook, and the machine to be in motion, the operation of the various parts are as follows:

The changes in the relative positions of the various elements of the machine consist in the further elevation of the plunger, the longitudinal movement of the pointed wire until its pointed end comes in contact with and forces back the free portion of the spring, the forward motion of the former-blade until it passes under the wire, and the forcing of the first seal into the hook by the combined action of a rotary and a fixed bumper, as before described. The above-named changes take place practically simultaneously. The movable cutting-disk now advances to the fixed one and severs or pinches off the wire blank from the line of wire. While the blank is being cut off, and for a short time thereafter, the former-blade is held stationary, but the plungers descend, the outer one in advance of the other. The outer plunger continues to descend, bending the wire blank over the former-blade into the shape of a staple, and passes down over the completed staple until its lower end reaches and presses the seal held in the hook firmly upon the die beneath and holds it until the completion of the loop. At the moment the outer plunger reaches and presses the seal the former-blade begins to recede and the inner plunger to descend, and this descent continues until the staple is driven through the seal and its ends inverted and turned back within the substance of the same, as before described. Upon the completion of the loop the plungers ascend and the movable cutting-disk leaves the stationary one to admit of the next feed of the wire, and the former-blade advances again to its forward position so as to receive the next blank wire as it is cut off. In this second advance motion of the former-blade its point enters the loop of the completed seal, lifts the seal, and carries it to the annular surface of the feeding-disk, by which it is carried to the channel, and from which it falls to the chute, and thence to the box placed under the the chute to receive the completed seals.

It will be understood that just before the seal is lifted by the point of the former-blade the rotary bumper has passed the stationary one and the seals on the annular part of the feeding-disk are relieved from any forced movement toward the hook. This release of the forward pressure upon the seals by the bumpers leaves them in a loose condition, and admits of the slight backward movement to which they are subjected as the completed seal is carried by the former-blade past the point of the hook.

The above description comprises one complete operation of the machine, beginning with the feed of the wire to the cutting-disks, and the others which follow are an exact counterpart of it, the seals being provided with loops at the rate of, say, two hundred or more per minute.

I claim as my invention—

1. In a machine for attaching wire loops to bottle-seals, an intermittent wire-feed mechanism, cutting devices to sever a blank from the wire, a former-blade, a plunger to bend the wire blank over the former-blade and shape the same into a staple, another plunger within and adapted to have a longitudinal movement independently of the first to drive

the staple down through the seal, a die having pits in its upper surface to invert the ends of the wire as the same pass through the seal, and a feeding mechanism to deliver the seals to the die, combined substantially as specified.

2. In a machine for attaching wire loops to bottle-seals, the combination of the devices, substantially as described, adapted to co-operate with others for cutting a wire blank from a coil of wire, for bending the blank into a staple, forcing the said staple through a seal and securing the ends therein, and a rotary annular feeding-surface, whereby seals when placed on the said annular surface are conducted to the said loop-affixing mechanism, substantially as specified.

3. In a machine for attaching wire loops to bottle-seals, the combination of a seal-feeding disk with an upwardly-extending rim located some distance from its circumference to form an annular space in which the seals are placed, segmental bumpers situated on the circumference of the said rim, and a stationary bumper which projects within the inner edge of the opening in which the said seals are placed, whereby as the said rotary bumpers pass the stationary one the seal-space is doubly contracted and a momentary forced feed of the seals toward the looping devices effected, substantially as specified.

4. In a machine for attaching wire loops to bottle-seals, the loop-affixing devices proper, substantially as described, combined with a rotary seal-feeding disk and a switch to direct the seals from the said disk to the loop-affixing devices, substantially as specified.

5. In a machine for attaching wire loops to bottle-seals, the combination of looping mechanism, substantially as described, combined with a table, a rotary annular feeding-surface for the seals, a hook to receive the first or end seal of the series, a die directly under the hook, and a switch to direct the seals from the annular surface and guide them to the said hook, substantially as specified.

6. In a machine for attaching wire loops to bottle-seals, a staple-inserting mechanism, substantially as described, combined with a rotary annular feeding-surface which conducts the seals to the said mechanism, a switch to deflect the seals from the annular surface to the said mechanism, and a channel or way (having an outlet) into which the completed seals are conducted by the said rotary annular surface, substantially as specified.

7. In a machine for attaching wire loops to bottle-seals, a wire-feeding mechanism, and cutting devices which consist of two circumferentially-adjustable disks, combined substantially as specified.

8. In a machine for attaching wire loops to bottle-seals, the cutting devices for the wire, substantially as described, which consists of a fixed disk and a similar disk which is movable to and from the other, the said disks being adjustable circumferentially, but held so as to not rotate in the cutting operation, substantially as specified.

9. In a machine for attaching wire loops to bottle-seals, the combination of a wire-feeding mechanism, cutters to sever a wire blank from the wire coil, and a spring whereby after the blank is cut off it is momentarily held in contact with the cutters, substantially as specified.

10. In a machine for attaching wire loops to bottle-seals, cutters to sever a wire blank from a coil of wire, a former-blade, a slotted block into which the end of the wire blank is fed, a spring to hold the said blank against the cutters, and a plunger to bend the wire blank over the former-blade and thereby form a staple, combined substantially as specified.

11. In a machine for attaching wire loops to bottle-seals, cutters to sever a wire blank from the wire coil, a former-blade, a slotted block into which the end of the wire blank enters in the feeding operation, a spring to hold the wire blank in contact with the cutters, a plunger to bend the wire blank over the former-blade, and another plunger to force the staple from the first plunger, combined substantially as specified.

12. In a machine for attaching wire loops to bottle-seals, the combination of a wire-feeding mechanism, cutters to sever a wire blank from the wire coil, and a former-blade secured to an arm the pivotal point of which is in the rear of the wire blank, whereby in the forward motion of the former-blade to a position under the wire blank it is slightly elevated so as to come in contact therewith, and a plunger to bend the wire over the said former-blade, substantially as specified.

13. In a machine for attaching wire loops to bottle-seals, the combination of a wire-feeding mechanism, cutters to sever a wire blank from the wire, and a former-blade attached to an arm the pivotal point of which is in the rear of the wire, the said former-blade having a point which in the forward movement of the same has an upward motion or sweep, and is thereby adapted to enter the loop of a completed seal and lift and discharge the same from the curling-die, substantially as specified.

14. In a machine for attaching wire loops to bottle-seals, the combination of a former-blade, a plunger to bend a wire over the former-blade and shape the same into a staple, a second plunger within the first and adapted to have a longitudinal movement longitudinally thereof, and a die having two pits in its surface, substantially as specified.

15. In a machine for attaching wire loops to bottle-seals, the combination of a former-blade, a plunger to bend a wire over the former-blade and shape the same into a staple, a second plunger within the first and adapted to have a longitudinal movement longitudinally thereof, and a die having pits in its sur-

face, which begin on a diametrical line and extend in opposite directions, whereby the points of the wire staple as they enter the said pits are inverted in contrary ways, substantially as specified.

16. In a machine for attaching wire loops to bottle-seals, the combination of a former-blade, a plunger to bend a wire over the former-blade and shape the same into a staple, a second plunger within the first and adapted to have a longitudinal movement longitudinally thereof, and a die having pits in its surface which are of segmental shape, as shown in a longitudinal section of the die taken lengthwise of the pits, substantially as specified.

17. In a machine for bending a straight wire blank into the form of a staple and inverting the ends of the staple and turning the said ends back toward the straight parts of the staple, the following elements, in combition: a former-blade, a branched plunger, a second plunger adapted to have a movement within the first, and a die with pits in its surface, which begin practically on a diametrical line and extend in diverging and opposite directions, substantially as specified.

18. In a machine for bending a wire blank into the form of a staple and inverting the points of the staple, the following elements, in combination: a former-blade, a plunger to bend the wire over the former-blade, a second plunger within the first and having a movement independently thereof to force the staple out of the first plunger, and a die having two segmental pits, combined substantially as specified.

19. The former-blade E′, having an adjustable and removable surface, combined with mechanism, substantially as described, to bend wire over it into the form of a staple, substantially as specified.

20. The former-blade E′, having a point adapted to enter the loop of a completed seal and thereby discharge it from the die, substantially as specified.

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