

No. 634,412.

Patented Oct. 3, 1899.

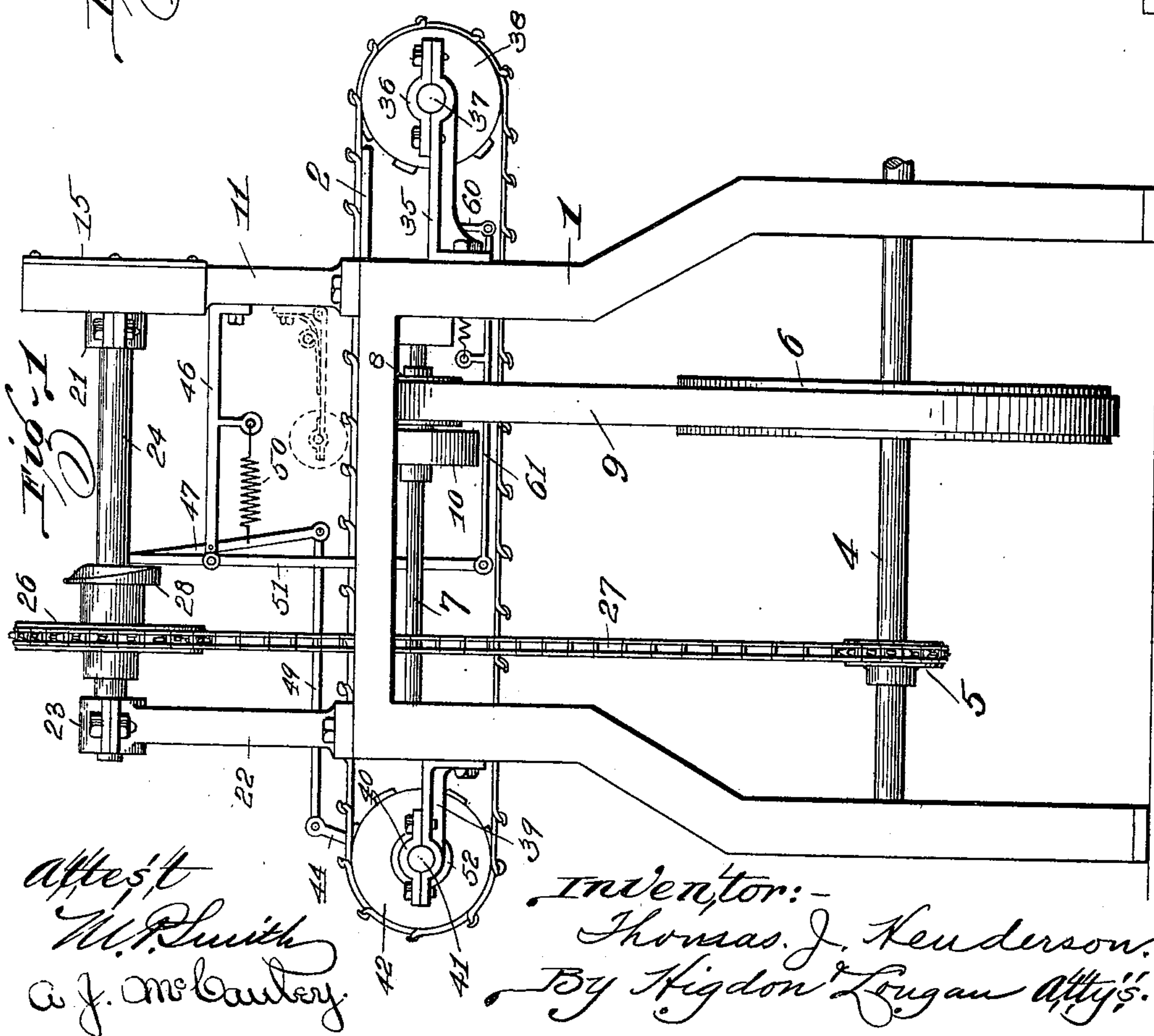
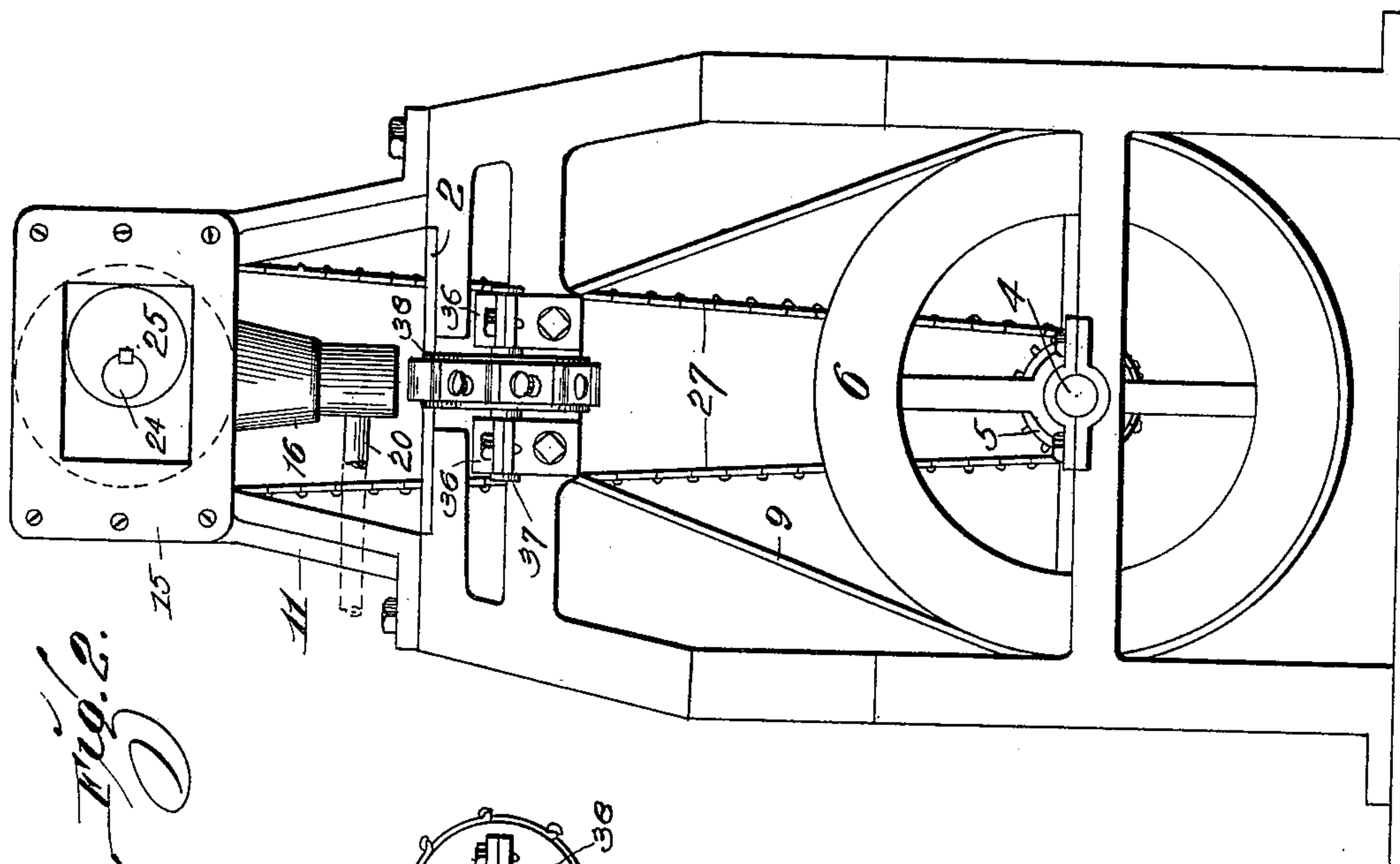
T. J. HENDERSON.

MACHINE FOR REOPENING BOTTLE SEALS.

(Application filed Dec. 27, 1898.)

(No Model.)

2 Sheets—Sheet 1.



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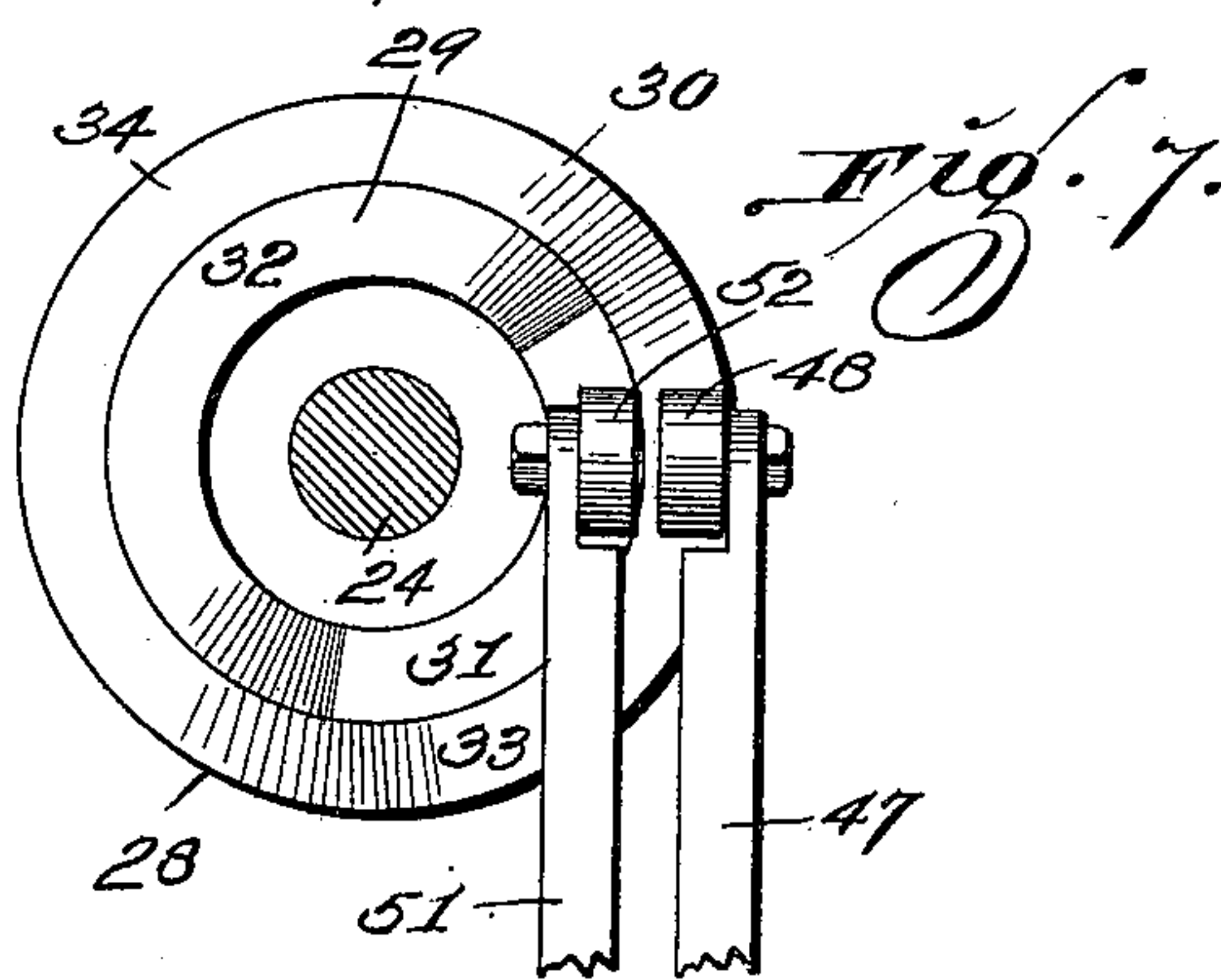
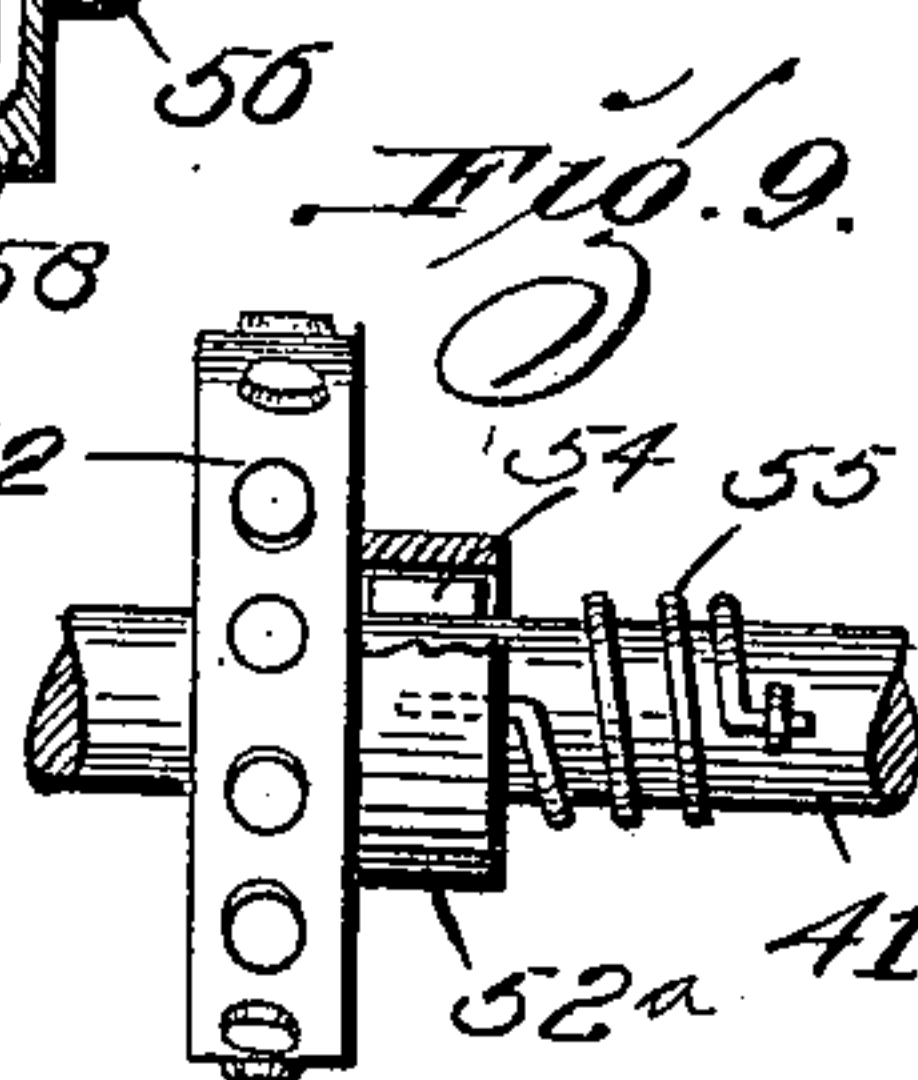
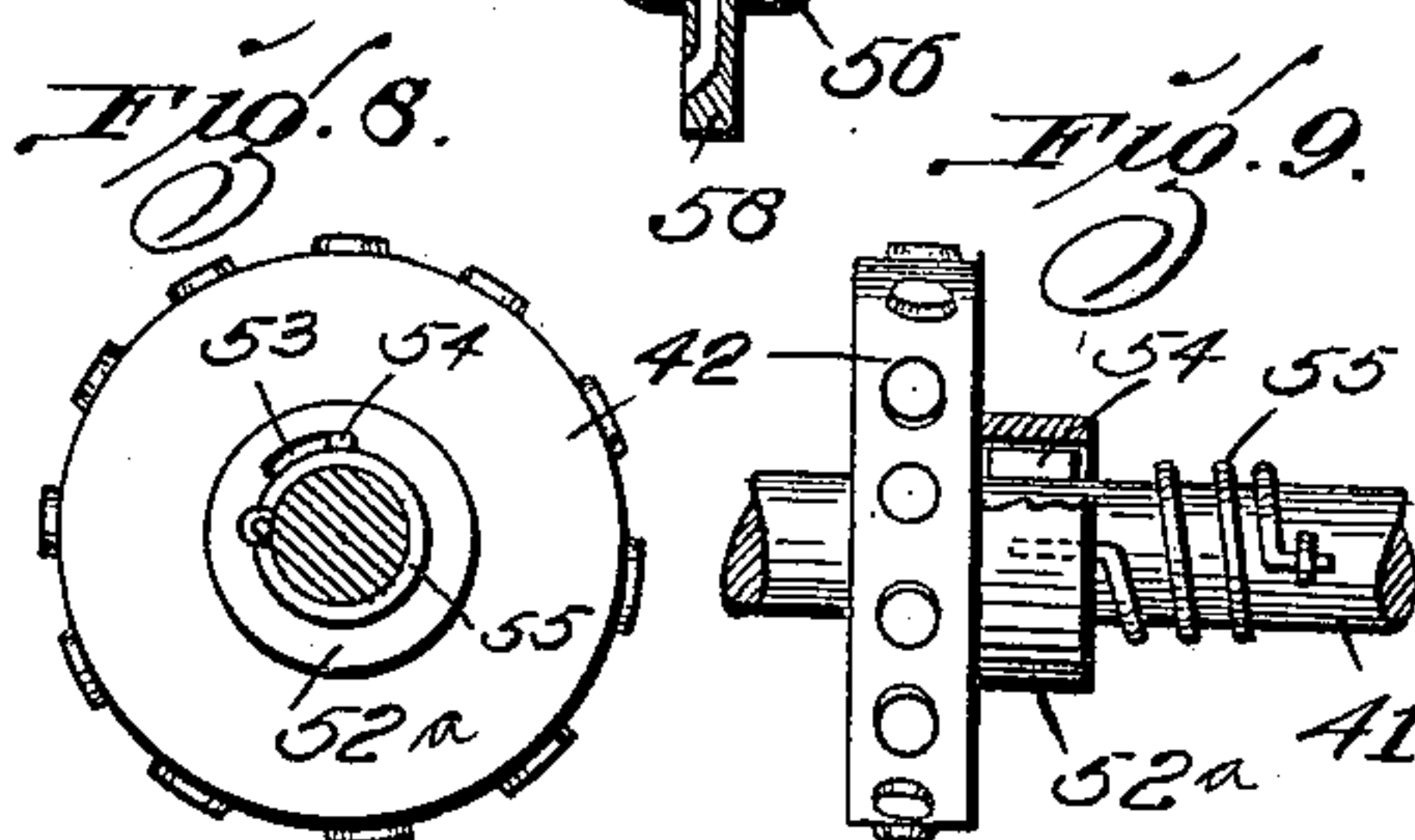
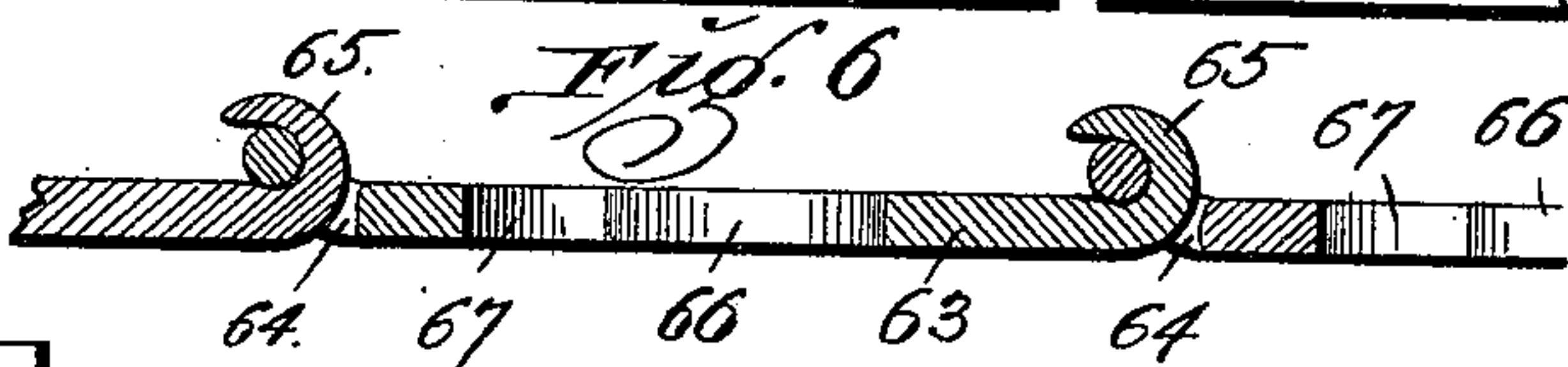
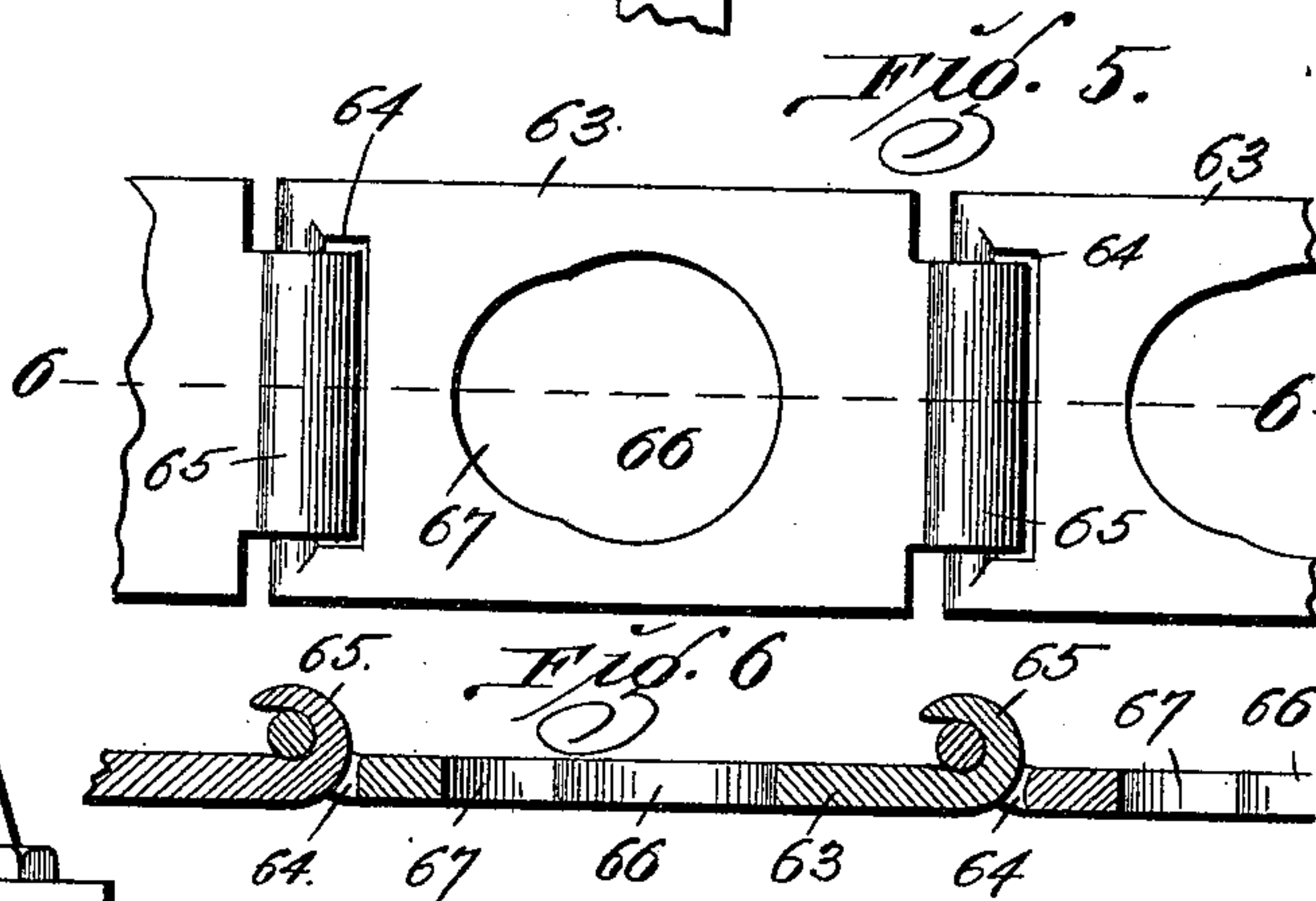
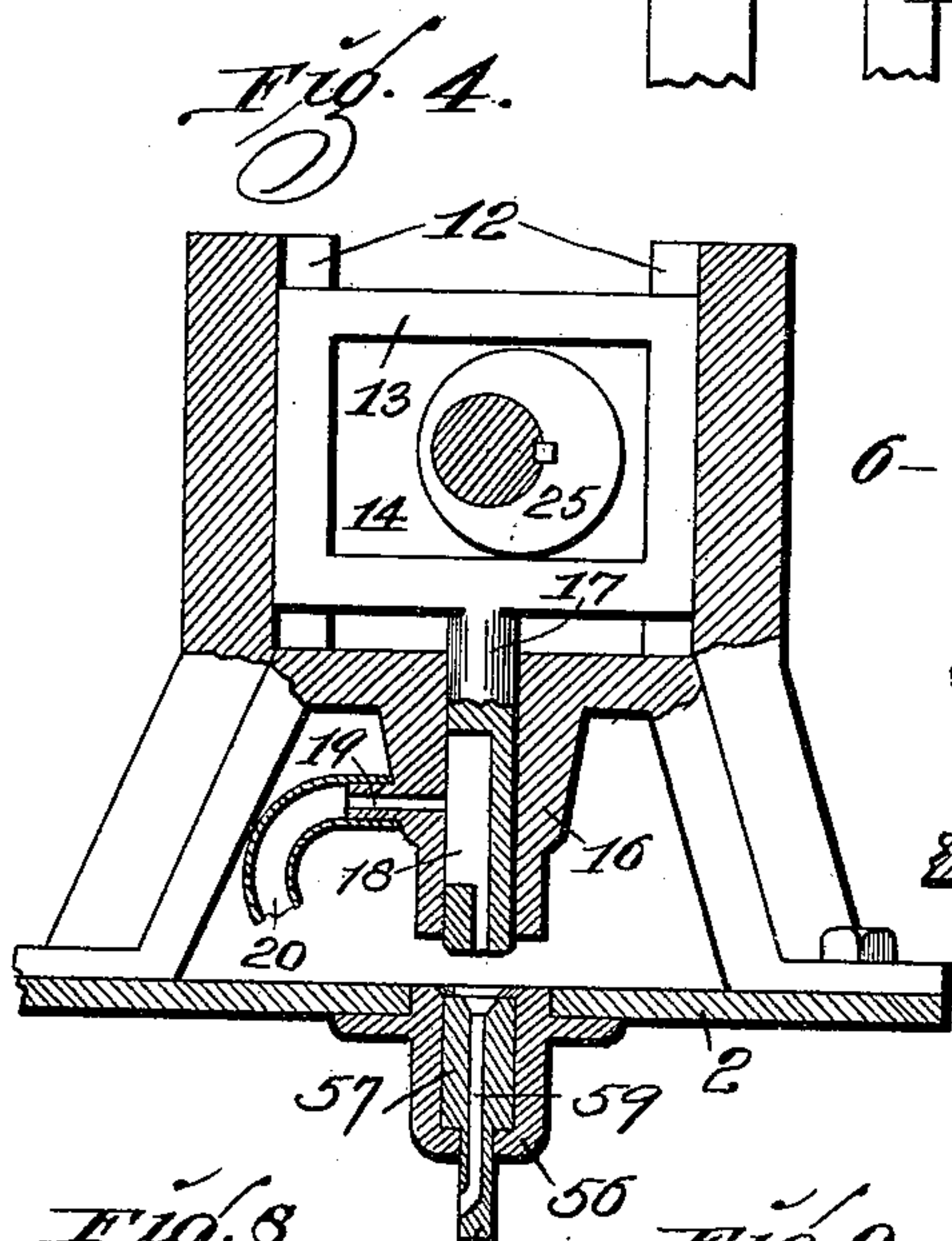
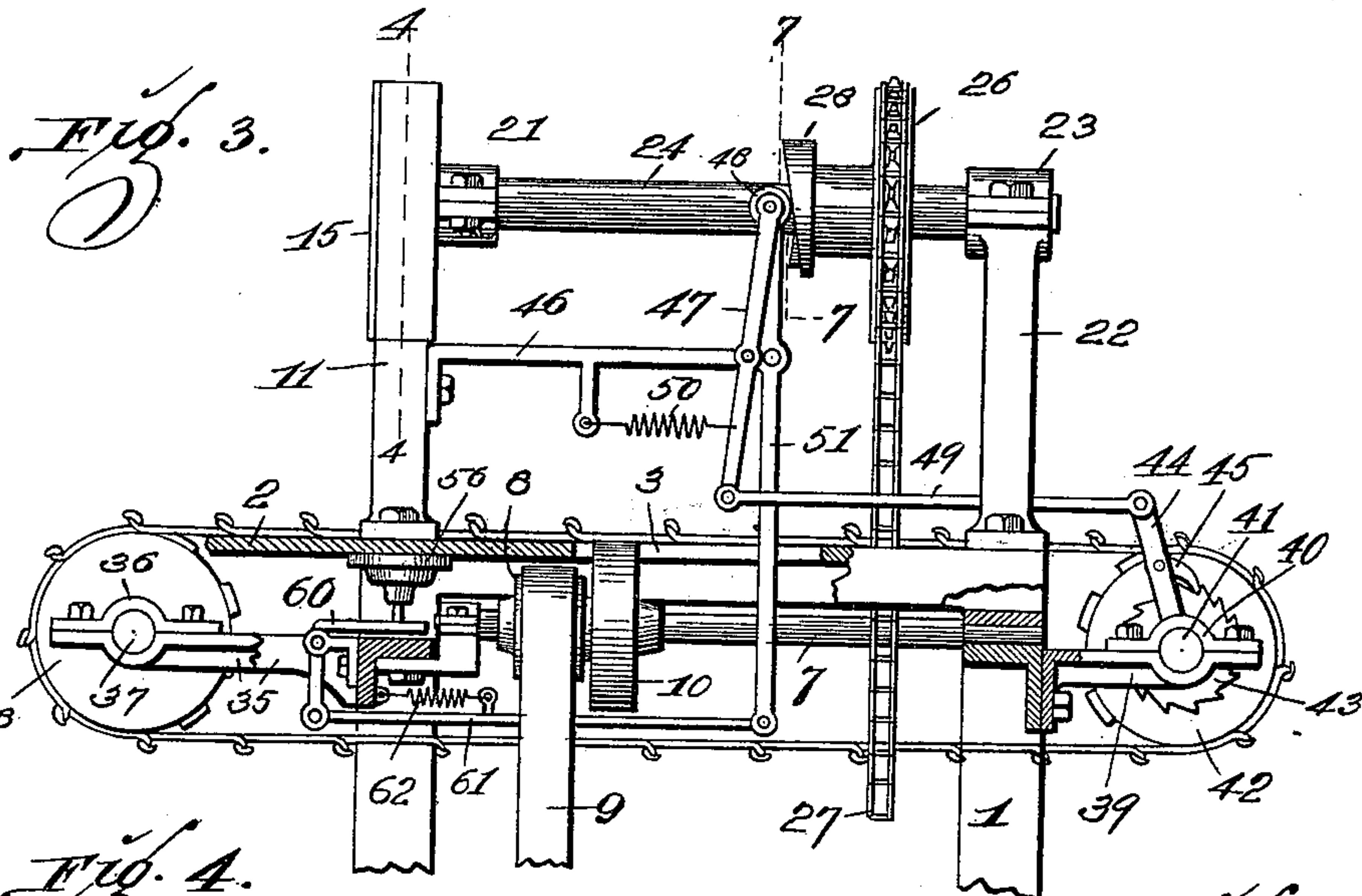
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MACHINE FOR REOPENING BOTTLE SEALS.

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(No Model.)

2 Sheets—Sheet 2.



attest  
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Inventor:  
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# UNITED STATES PATENT OFFICE.

THOMAS J. HENDERSON, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF  
TO CHRISTIAN GROSS, OF SAME PLACE.

## MACHINE FOR REOPENING BOTTLE-SEALS.

SPECIFICATION forming part of Letters Patent No. 634,412, dated October 3, 1899.

Application filed December 27, 1898. Serial No. 700,424. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS J. HENDERSON, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Machines for Reopening Bottle-Seals, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to machines for reopening bottle-seals; and it consists of the novel construction, combination, and arrangement of parts hereinafter described and claimed.

Figure 1 is a side elevation of my improved machine. Fig. 2 is a front elevation thereof. Fig. 3 is an elevation of the side of the machine opposite from the side seen in Fig. 1, and a portion of said machine being in section to more clearly illustrate the same. Fig. 4 is an enlarged vertical sectional view taken approximately on the line 4 4 of Fig. 3. Fig. 5 is a plan view of a combined carrier and sprocket-chain made use of in my improved machine. Fig. 6 is a sectional view taken approximately on the line 6 6 of Fig. 5. Fig. 7 is an enlarged vertical sectional view taken approximately on the line 7 7 of Fig. 3. Fig. 8 is a side elevation of the sprocket-wheel at the rear end of the machine. Fig. 9 is an edge view of said sprocket-wheel.

In the construction of my improved machine I make use of a rectangular frame 1, on top of which is located a flat table 2, which table projects a slight distance in front of the frame, and in the center of said table is formed an opening 3. Extending longitudinally throughout the lower portion of the frame and arranged for rotation in suitable bearings is a shaft 4, upon which is located a small sprocket-wheel 5 and a large fly-wheel 6.

Extending longitudinally throughout the frame immediately beneath the table 2 and arranged for rotation in suitable bearings is a shaft 7, on which is located a belt-wheel 8 in vertical alinement with the fly-wheel 6, there being a belt 9 connecting said belt-wheel 8 with said fly-wheel, and arranged upon said shaft 7 adjacent to this belt-wheel is a polishing-wheel 10, the same extending upwardly through the opening 3 in the table 2. The path of travel of this polishing-wheel

10 is in horizontal alinement with the top surface of the table 2.

Rigidly seated on top of the front of the frame 1 is a frame 11, in the upper portion of which frame is formed a pair of vertically-arranged guideways or bearings 12, in which is arranged for vertical movement a rectangular block 13, the same being provided with a rectangular opening 14. The front of the upper end of this frame 11 is closed by a rectangular plate 15, and projecting downwardly from a horizontal bar formed in the center of said frame is a stem 16, through which operates a plunger 17, that is formed integral with a rectangular block 13. This plunger 17 is the male member of the die of my improved machine, and formed in said plunger is a vertical bore or passage 18, that communicates with an inlet-port 19, formed in the stem 16, to which inlet-port 19 leads a flexible tubular connection 20, suitable for conveying a blast of steam or air.

Formed integral with the rear side of the upper portion of the frame 15 is a bearing 21, and rigidly seated upon the top of the rear end of the frame 1 is a vertically-arranged frame 22, in the upper end of which are formed the bearings 23, that are in alinement with said bearings 21. A shaft 24 is rotatably arranged in these alined bearings, the forward end of said shaft being provided with an eccentric 25, that operates within the opening 14 in the block 13. Rigidly fixed upon the shaft 24, adjacent the rear end thereof and in vertical alinement with the sprocket-wheel 5 previously mentioned, is a sprocket-wheel 26, said sprocket-wheels being connected by a sprocket-chain 27, and integral with the hub of this sprocket-wheel 26 is a disk 28, on the face of which is formed a pair of concentric eccentrics 29 and 30. The inner eccentric 29 is provided with a high face 31 and a low face 32, the offset between said faces being very sharp in order to impart a quick motion to the roller operating upon said eccentric, while the larger eccentric 30 is provided with a high face 33 and a low face 34, the offset between said faces being very gradual, so as to give a slow movement to the roller operating on said face.

Bolted to the transversely-arranged bar on the front of the frame of the machine are the

forwardly-projecting brackets 35, in the outer ends of which are formed aligned bearings 36, in which is rotatably arranged a shaft 37. Rigidly fixed upon said shaft between said 5 bearings is a sprocket-wheel 38, the teeth of said sprocket-wheel being perfectly round and very short.

Bolted to a bar at the rear end of the frame 1 are the rearwardly-projecting brackets 39, 10 in the rear ends of which are formed aligned bearings 40, in which is rotatably arranged a shaft 41. Upon said shaft 41 is loosely mounted a sprocket-wheel 42, identical in size and construction with the sprocket-wheel 38, and 15 fixed to said sprocket-wheel 42 is a ratchet-wheel 43. An arm 44 is rotatably arranged upon the shaft 41 adjacent the ratchet-wheel 43, which arm carries a gravity-pawl 45, the point of which engages the teeth of said 20 ratchet-wheel.

Bolted to the rear side of the frame 11 and projecting rearwardly therefrom is a bracket 46, on the outside of which is fulcrumed an arm 47, the upper end of which carries a roller 48, that rides directly upon the outer eccentric 30. A connecting-rod 49 connects the 25 upper end of the arm 44 with the lower end of said arm 47, and a retractile coil-spring 50 is secured to the lower end of said arm 47, the opposite end of said spring being secured to the bracket 46, and said spring normally holds the roller 48 against the surface of the eccentric 30. An arm 51 is fulcrumed upon 30 the opposite side of the outer end of the bracket 46, the upper end of said arm 51 carrying a roller 52, that rides upon the eccentric 29, the lower end of said arm 51 projecting downwardly through the opening 3 in the table 2.

A friction-sleeve 52<sup>a</sup> is arranged upon the 40 shaft 41 on the opposite side of the sprocket-wheel 42 from the ratchet-wheel 43, in which sleeve is formed a segmental slot 53, there being a lug or feather 54 fixed upon the shaft 41, which operates in said slot. An expansive coil-spring 55 is arranged around the 45 shaft 41 adjacent to the sleeve 52<sup>a</sup>, the forward end of said spring bearing against the rear side of the friction-sleeve, and the rear end of said spring is fixed to the shaft 41. The normal tendency of this spring is to force the friction-sleeve against the face of the sprocket-wheel and also to throw the sprocket-wheel 42 rearwardly a slight distance upon the shaft 41 or until the lug or feather 54 occupies the forward end of the 50 slot 53.

Seated in the table 2 immediately beneath the stem 16 is a bushing 56, in which is arranged for operation a vertically-moving plunger 57, which performs the function of a female die that acts in conjunction with the plunger 17, said plunger 57 being provided with a stem 58, that projects downwardly 60 through the bushing 56, and formed in said plunger 57 is a vertical passage 59, the same discharging outwardly through the stem 58.

Fulcrumed to the cross-bar in the front of the frame of the machine is a bell-crank 60, the outer end of the horizontal arm of which 70 engages the under side of the stem 58, the lower end of the vertical portion of which bell-crank is connected to the forward end of the connecting-rod 61, the rear end of which is pivotally connected to the lower end 75 of the arm 51. A retractile coil-spring 62 has one end secured to the frame of the machine, the opposite end being secured to said connecting-rod 61, and the action of said coil-spring 62 retains the roller 52, carried by the 80 upper end of the arm 51, against the eccentric 30.

The sprocket-chain that travels longitudinally over the center of the table 2 and around the sprocket-wheels 38 and 42 is constructed 85 so as to receive and carry the bottle-seals between the vertically-moving plungers or dies, after which they are carried over the polishing-wheel and from thence to the rear of the machine, where they are pushed out of the 90 chain by the teeth of the sprocket-wheel 42. This chain is composed of a plurality of flat metallic links 63, each one of which is provided at one end with a transverse slot 64 and at its opposite end with an upwardly 95 projecting hook 65, which engages in the slot 64 of the succeeding link. Formed in the center of each link 63 is a circular aperture 66, the same being slightly smaller than is the flange of the bottle-seal, and a segmental 100 recess 67 is formed in each link, the diameter of which recess is slightly less than the diameter of the body portion of the seal, and said recess communicates with and is a part of the aperture 66. 105

In some instances it may be found necessary to hinge a spring-actuated arm to the rear side of the stem 16, which arm extends rearwardly a slight distance to a point directly over the polishing-wheel 10, and upon 110 the outer end of said arm is rotatably arranged a rubber-faced roller. This construction is shown in dotted lines in Fig. 1 and is for the purpose of retaining the opened seals in the apertures 66 while they are being polished by the wheel 10. 115

The operation of my improved machine is as follows: As the shaft 4 is driven rotary motion is transmitted to the shafts 7 and 24 by the belt 9 and sprocket-chain 27, and owing 120 to the difference in size of the belt-wheels 6 and 8 said shaft 7, and consequently the polishing-wheel 10, will be driven at a high rate of speed. As the shaft 24 rotates, the disk 28, having the eccentrics 29 and 30 formed 125 on its face, will necessarily rotate, and the upper ends of the arms 47 and 51 will move outwardly and inwardly as the rollers carried by said arms travel upon the eccentric-faces. As the upper end of the arm 47 is moved forwardly by the higher portion 33 of the eccentric 30 the lower end of said arm will be moved rearwardly, thus actuating the arm 44 and causing the point of the pawl 45, carried 130

by said arm, to engage one of the teeth of the ratchet-wheel 43 and move said ratchet-wheel a slight distance in rotation. As said ratchet-wheel is fixed to the sprocket-wheel 42, said sprocket-wheel 42 will be partially rotated, which partial rotation will cause the combined chain and carrier traveling over said sprocket-wheel to move a short distance. The eccentric 30, together with the arms 47 and 44 and connecting-rod 49, is so constructed as that at each movement or actuation the chain is moved rearwardly the length of one link at a time, and the various parts just mentioned are so arranged as that the aperture 66 of each link is brought to a point immediately between the plungers 17 and 57, forming the die. Thus with the continued rotation of the shaft 24 the chain is moved intermittently around the sprocket-wheels 38 and 42. A very slight return movement or backlash for the combined chain and carrier is provided by the mechanism seen in Figs. 8 and 9. When the arm 44 is actuated to partially rotate the sprocket-wheel 42, said sprocket-wheel partially rotates upon the shaft 41, and as it does so the friction-sleeve 52 travels with said sprocket-wheel the length of the slot 53, and then said sprocket-wheel 42 travels the balance of its stroke by itself and in so doing overcomes the resistance of the friction offered by the sleeve 52. When said sprocket-wheel 42 has moved its distance, the friction-sleeve 52, engaging against the face of said sprocket-wheel and actuated by the torsional strain of the coil-spring 55, will move said sprocket-wheel rearwardly the distance of the slot 53 or until the lug or feather 54 engages against the end of said slot 53. Thus the chain is moved a slight distance rearwardly, this action being repeated with every stroke of the arm 44. This backlash is for the purpose of taking the strain of the carrier and chain off from the sprocket-wheels, and said backlash also serves to bring the aperture 66 in the link 63 immediately beneath the plunger 17. The motion of the chain and carrier is intermittent, and every time said chain and carrier stops one of the links is directly between the two plungers forming the die and another one of said links carrying one of the opened bottle-seals stops directly above the polishing-wheel 10, and as said polishing-wheel is rotating at a high rate of speed the top of said seal is polished.

The face of the eccentric 29 is so arranged as that the arm 51 is actuated so as to operate the bell-crank 60 to throw the plunger 57 upwardly at the time one of the links of the chain containing one of the unopened bottle-seals stops immediately above said plunger 57, and at the same time the eccentric 25, carried by the shaft 24, moves the rectangular block 13 downwardly in the guideways 12, thus moving the plunger 17 downwardly, and the unopened seal that is carried by the link between said plungers is engaged between the meeting ends of said plungers, and the

crimped edge of said unopened seal is bent outwardly. With the return movement of the plungers 17 and 57 the chain and carrier are moved forward the length of one link, as previously described, and the succeeding link containing an unopened bottle-seal is brought into position between the plungers of the die to be engaged between the meeting ends of said plungers at their next movement. As the chain moves across the table 2 the open seals are drawn into the recesses 67 in the links 63, and said open seals are finally pushed out of the links by the teeth of the sprocket-wheel 42.

The unopened bottle-seals are placed by the operator in the apertures 66 upon the extending portion of the table 2 with the cork disks in said seals upwardly, and said cork disks are cleansed and softened by the action of a steam-jet which is introduced through the plunger 17 by means of the flexible connection 20 and inlet-port 19.

Any particles of dust or dirt that might adhere to the under side of the seal will pass downwardly through the passage or bore 59 in the plunger 57 and will not clog up the aperture in which said plunger operates.

A machine of my improved construction is simple, automatic in all its workings, and very efficiently and rapidly opens the crown bottle-seals now in general use.

I claim—

1. In a machine for reopening bottle-seals, a suitable frame, a table in the top of said frame, a pair of vertically-operating aligned plungers, in which plungers are formed vertical bores, a suitable steam connection discharging into the bore in the upper plunger, means whereby said plungers are simultaneously moved toward one another, an endless carrier operating over the table and between said plungers, the links of which carrier are adapted to receive and retain bottle-seals, and means whereby said chain is intermittently moved across said table, substantially as specified.

2. In a machine for reopening bottle-seals, a seal-carrying chain comprising a plurality of links, in the centers of which links are formed circular apertures, there being recesses formed in the bodies of said links which communicate with said centrally-arranged apertures, and integral hooks formed at one end of each of said links, which hooks engage in apertures formed in the opposite ends of said links, substantially as specified.

3. A machine for reopening bottle-seals, constructed with a pair of vertically-moving plungers, in the upper one of which plungers is formed a bore for the passage of steam and there being a vertically-arranged bore formed in the lower one of the plungers, substantially as specified.

4. In a machine for reopening bottle-seals, a suitable frame, a table arranged on top of said frame, a longitudinally-extending shaft journaled in bearings immediately below said

table, a bushing arranged at one end of the  
table, a stem arranged immediately above  
said bushing, vertically-moving plungers op-  
erating through said stem and bushing,  
5 means whereby said plungers are simultane-  
ously moved toward one another, a sprocket-  
wheel journaled at each end of the frame, an  
endless seal-carrying chain passing around  
said sprocket-wheels over the table between  
10 the plungers, means whereby said seal-car-  
rying chain is intermittently actuated, means  
whereby the longitudinally-extending shaft

is rotated, and a polishing-wheel carried by  
said shaft, the periphery of which polishing-  
wheel engages the under sides of the links 15  
composing the endless carrier, substantially  
as specified.

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

THOMAS J. HENDERSON.

Witnesses:

M. P. SMITH,

A. J. MCCAULEY.