

No. 792,017.

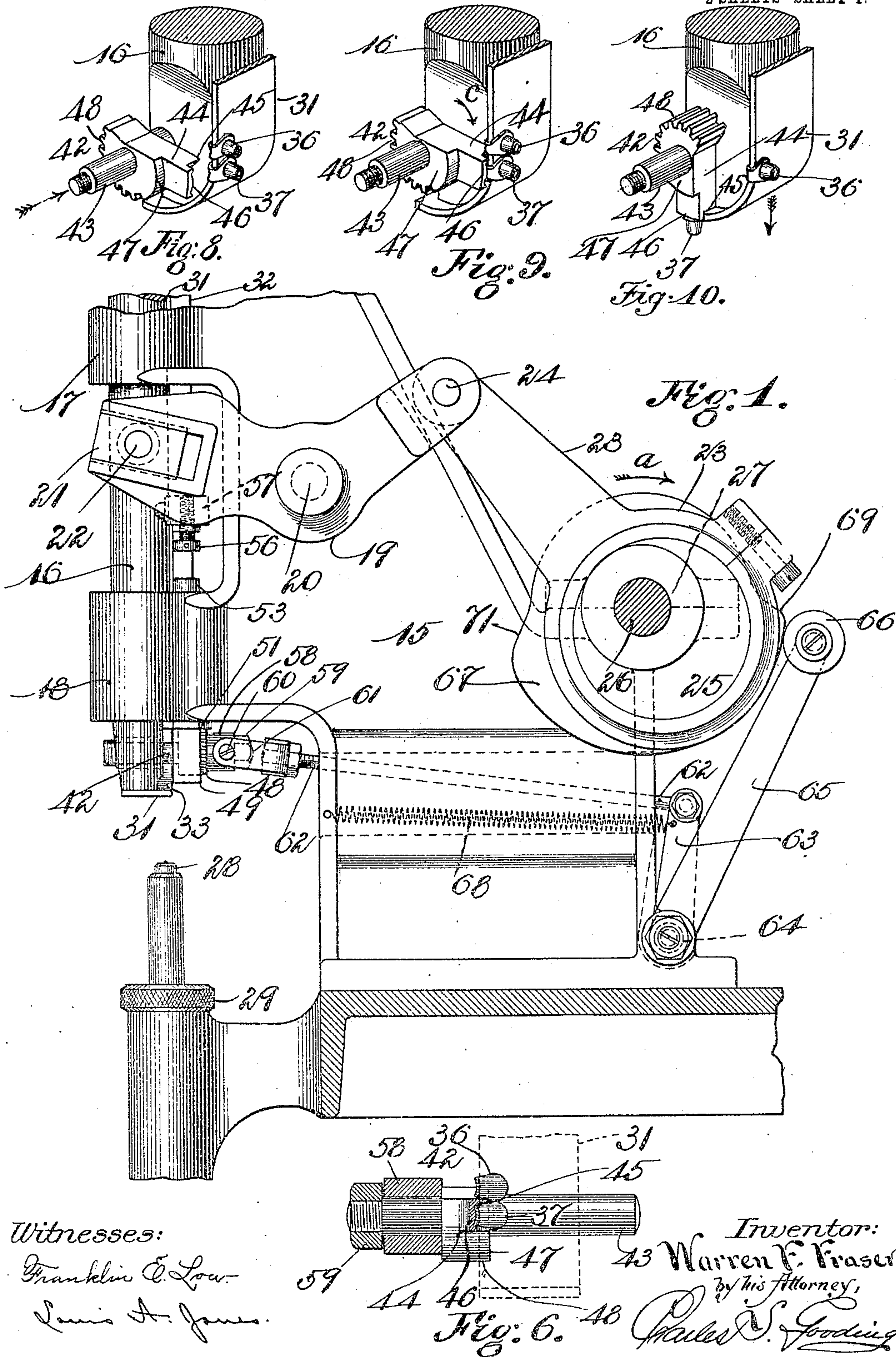
PATENTED JUNE 13, 1905.

W. F. FRASER.

MACHINE FOR SETTING LACING HOOKS, RIVETS, OR THE LIKE.

APPLICATION FILED JULY 11, 1904.

2 SHEETS—SHEET 1.



Witnesses:

Franklin E. Low.

Louis A. Jones.

Inventor:

Warren F. Fraser,

by his Attorney,

Charles S. Gooding.

No. 792,017.

PATENTED JUNE 13, 1905.

W. F. FRASER.

MACHINE FOR SETTING LACING HOOKS, RIVETS, OR THE LIKE.

APPLICATION FILED JULY 11, 1904.

2 SHEETS—SHEET 2.

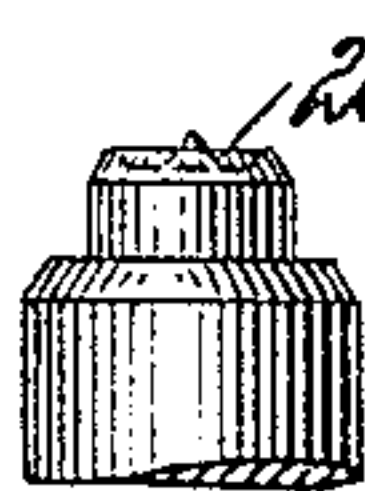
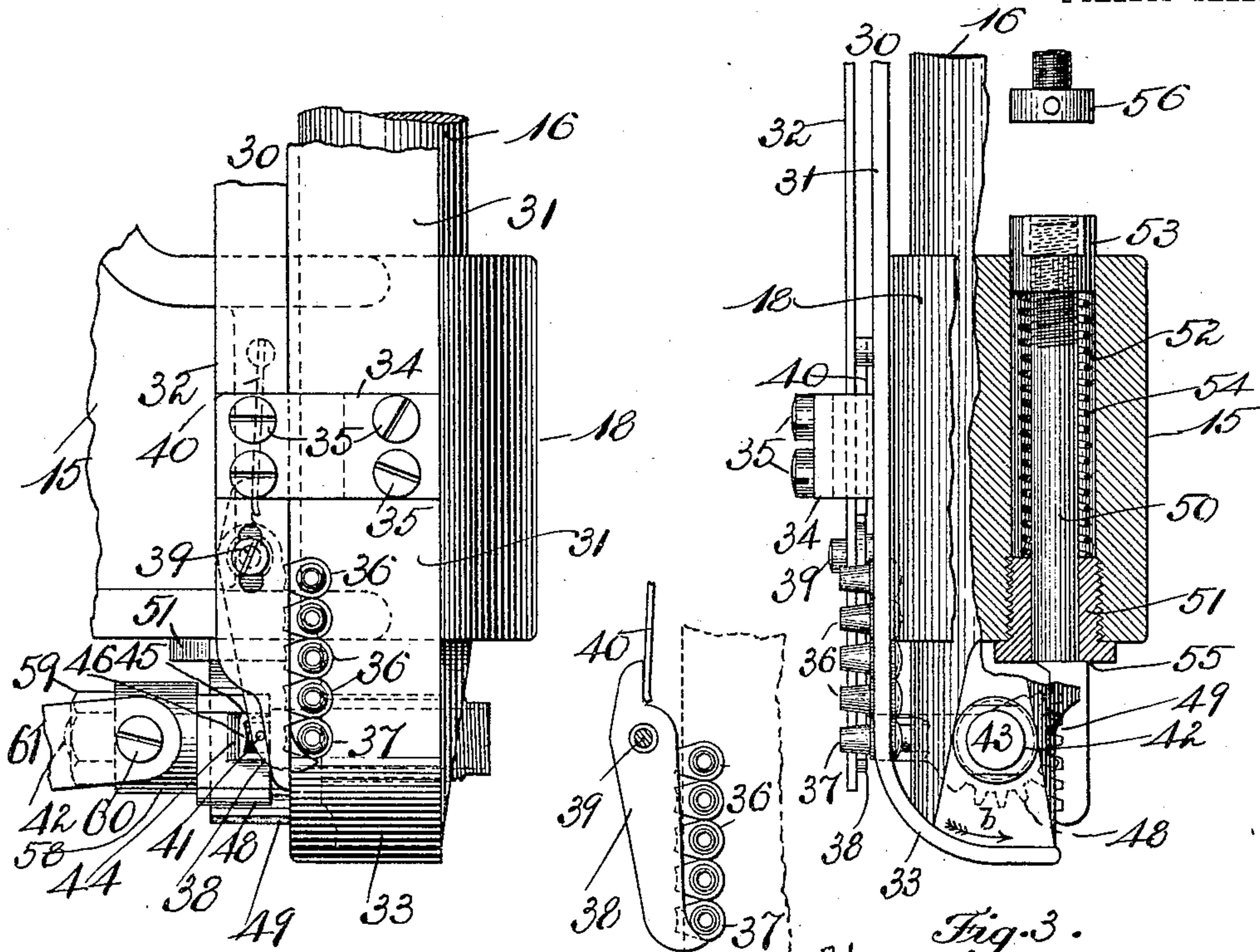


Fig. 2.

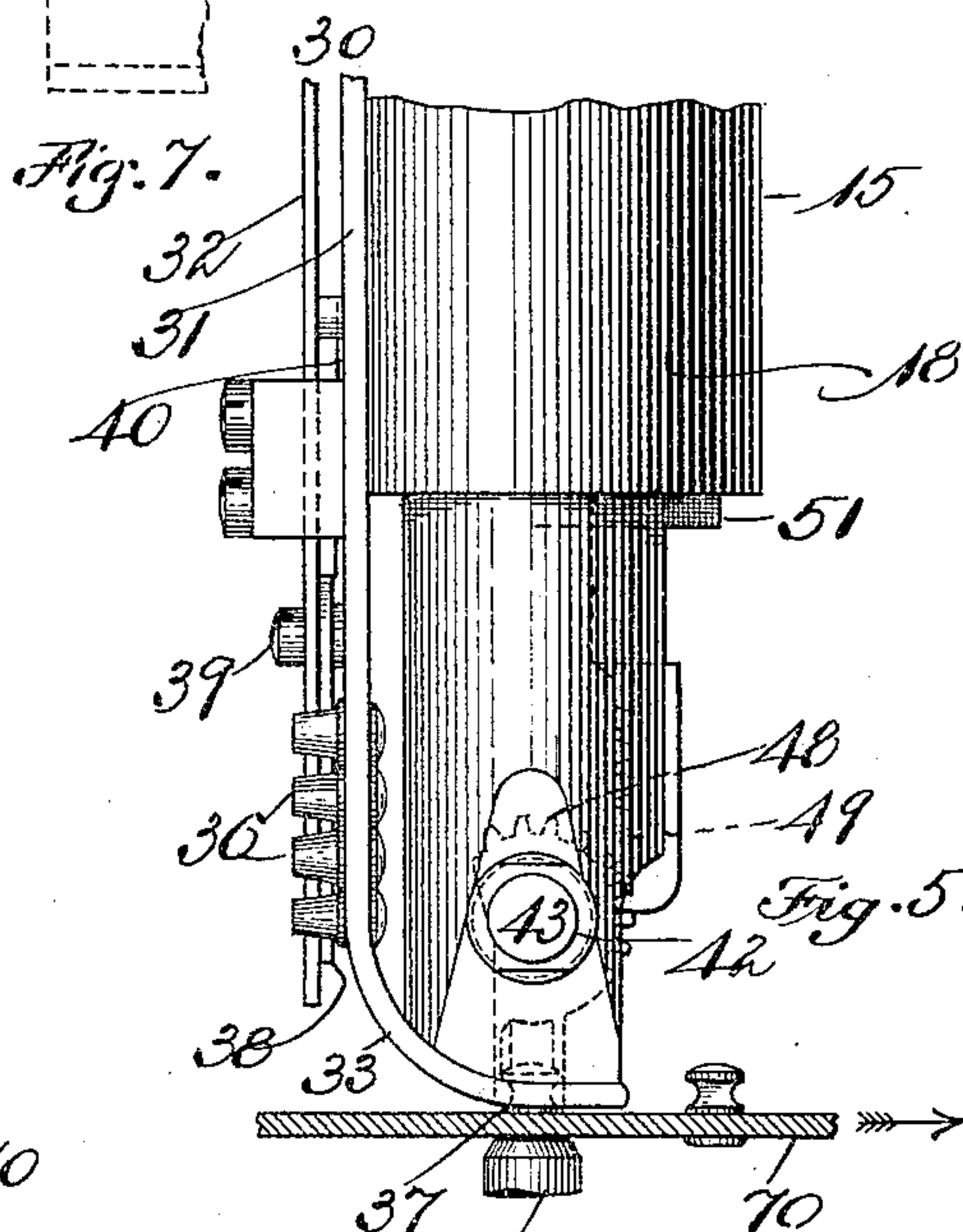


Fig. 4.

Fig. 5.

Witnesses:
Franklin E. Low.
Lewis A. Jones.

Inventor:
Warren F. Fraser.
By his Attorney,
Charles S. Gooding.

UNITED STATES PATENT OFFICE.

WARREN F. FRASER, OF DORCHESTER, MASSACHUSETTS.

MACHINE FOR SETTING LACING HOOKS, RIVETS, OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 792,017, dated June 13, 1905.

Application filed July 11, 1904. Serial No. 216,057.

To all whom it may concern:

Be it known that I, WARREN F. FRASER, a subject of the King of England, residing at Dorchester, in the county of Suffolk and State
5 of Massachusetts, have invented new and useful Improvements in Machines for Setting Lacing Hooks, Rivets, or the Like, of which the following is a specification.

This invention relates to machines for feeding, driving, and setting lacing hooks, rivets, and the like in which said lacing hooks or rivets are fed from a hopper to a raceway and standing upon said raceway in a column one above the other are separated one by one
15 from said column, carried to the desired position in relation to a piece of sheet material, such as leather, and then driven through said leather and against an anvil, whereby they are clenched or set in said material.

The object of this invention is, therefore, to provide a machine of the character hereinbefore set forth in which the articles to be driven and set in the material shall be positively, accurately, and above all quickly separated from
25 the column of like articles upon said raceway, carried to the desired position in relation to the material in which it is to be driven and held firmly while being driven through said material and clenched therein, and finally released immediately upon the completion of
30 the clenching operation in order to give all the time possible for the material, with its hook or rivet clenched thereto, to be fed forward in readiness to receive another hook or
35 rivet.

The object of this invention is, further, to provide a machine in which the several steps in the process of feeding or setting the hook or rivet may be accomplished with the slightest possible number of parts coming into contact with said article, and thus avoiding injury to the same.

To these ends my invention consists in a raceway to hold hooks, rivets, or the like, a separator, mechanism to move said separator toward and away from said raceway, and mechanism to impart a rotary motion to said separator, whereby said articles are separated one by one from a column of hooks upon one
45 portion of said raceway, carried to another

portion of said raceway, and held in position ready to be driven through sheet material and clenched therein against an anvil.

The invention again consists in the instrumentalities hereinbefore set forth, in combination with mechanism to impart a reciprocatory motion to said raceway toward and away from said anvil.

The invention finally consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings, Figure 1 is a right-hand side elevation, partly in section, of a portion of a lacing-hook-setting machine
65 embodying my invention. Fig. 2 is an enlarged left-hand side elevation of a portion of my improved lacing-hook-setting machine with the plunger and raceway in their uppermost position and the separator in position to move forward to separate the lowermost hook from the column of hooks upon the raceway. Fig. 3 is a front elevation, partly in section, of a portion of my improved lacing-hook-setting machine as viewed from
75 the left of Fig. 1 or from the right of Fig. 2. Fig. 4 is a left-hand side elevation, partly in section, similar to Fig. 2, but illustrating the plunger and raceway lowered and the lacing-hook set in the material. Fig. 5 is a front elevation of a portion of my improved lacing-hook-setting machine as viewed from the right of Fig. 4. Fig. 6 is a detail elevation, partly in section, of the separator and carrier and collar, together with two lacing-hooks, also in section, a portion of the raceway being indicated in relation thereto in dotted lines. Fig. 7 is a detail side elevation of the detent, together with several hooks and a portion of a raceway, indicated in dotted lines. Fig. 8 is
90 a perspective view of the separator and carrier, together with a portion of the plunger and raceway, with two hooks upon said raceway, said separator being shown in the same relative position to the raceway as in Fig. 2. Fig. 9 is a view similar to Fig. 8 with the separator and carrier moved forward to engage and separate the lowermost hook from the column of hooks upon the raceway. Fig. 10 is a view similar to Fig. 8 with the separator
100

and carrier rotated a quarter-turn from the position which it occupies in Figs. 2, 3, 8, and 9 to the position shown in Figs. 4 and 5.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 15 is the frame of a lacing-hook-setting machine, which may be of any desirable shape and construction.

16 is a plunger consisting of a cylindrical rod constructed to slide in bearings 17 18 upon the frame 15. A reciprocatory motion is imparted to the plunger 16 by a lever 19, pivoted at 20 to the frame 15 and connected to said plunger by a sliding block 21 and stud 22. A rocking motion is imparted to the lever 19 by an eccentric-strap 23, pivotally connected thereto by a pin 24. The eccentric-strap 23 encircles an eccentric 25, fast to the main driving-shaft 26 of the machine, said main driving-shaft being journaled to rotate in bearings 27, formed in the frame of said machine. The lacing-hooks are clenched against an anvil 28, which is adjustably secured by a nut 29 to the frame 15.

A raceway 30 is fastened to and moves with the plunger 16 and extends upwardly to a hopper, (not shown in the drawings,) from which it receives lacing-hooks in a manner well known to those skilled in this art. The raceway 30 is formed in two parts, of sheet metal, 31 and 32, the part 31 being fastened rigidly to the plunger 16 and having at its lower end a curved portion or quarter-bend 33. The portion 32 of the raceway 30 is fastened to the portion 31 by a plate 34 and screws 35 35, Fig. 2. The hooks 36 descend the raceway 30 until the lowermost hook 37 rests against a finger or detent 38, which is pivoted to a screw 39, adjustably secured to the part 32 of the raceway. A spring 40 holds the detent normally in the position shown in Fig. 2, with a pin 41 fast to said detent and in contact with the left-hand edge of the raceway-plate 32 and the lower end of said detent extending beneath and in contact with the shank portion of the lowermost hook 37.

The lowermost hook 37 is separated from the other hooks 36 in the column of hooks located upon the raceway 30 by means of a separator and carrier 42, (illustrated in detail in Fig. 6 and in perspective in Figs. 8, 9, and 10,) said separator and carrier separating said lowermost hook from the column of hooks and then carrying it downwardly past the detent 38 and around the curved portion 33 of the raceway-plate 31 in position to be driven as hereinafter described. Said separator and carrier consists of a cylindrical shank portion 43, journaled to rotate in the plunger 16 and to slide transversely of said plunger. Said separator and carrier is provided with an arm 44, which is angular in cross-section and extends transversely of said shank 43, one side 45 of said angular arm extending substantially parallel to the median line of said shank por-

tion and being sharpened upon the edge sufficiently to allow it to enter between the lowermost hook 37 and the hook 36 immediately above said hook 37, thus separating the lowermost hook from the column of hooks upon the raceway 30, when the separator and carrier is moved toward the right, as hereinafter described, from the position shown in Fig. 8 to that shown in Fig. 9. The other side 46 of the angular arm 44 is formed to approximately fit the neck of the lacing-hook, as shown in Fig. 6. The separator and carrier 42 has an enlarged portion 47 integral therewith, upon which is cut a segmental gear 48, which meshes into a rack 49, Figs. 3 and 5. The rack 49 has a cylindrical shank 50 integral therewith and projecting upwardly therefrom, Fig. 3, through a bushing 51, fast to the frame 15 of the machine, and above said bushing said shank projects through a recess 52 in said frame and has fastened to its upper end a sleeve 53, constructed to slide in the recess 52. Between the sleeve 53 and the bushing 51 a spiral compression-spring 54 encircles the shank 50, said spring acting normally to hold the rack 49 in the position shown in Fig. 3, with the shoulder 55 at the upper end of said rack bearing against the lower face of the bushing 51. A screw or lug 56, Figs. 1 and 3, is adjustably fastened to a stud 57, which in turn is rigidly fastened to the plunger 16.

A collar 58 is rotatably mounted upon the shank 43 of the separator and carrier 42 and is held upon said shank by a nut 59, said nut being screwed against a shoulder upon said shank, and thus leaving the collar 58 free to rotate thereon. The collar 58 is pivotally connected by screws 60 to a forked connection 61, which in turn is connected by a rod 62 to a rocker-arm 63, fast to a rock-shaft 64, Fig. 1. The rock-shaft 64 is journaled to rock in bearings in the frame 15 and has fast to the outer end thereof a cam-lever 65, provided with a cam-roll 66, which bears against the periphery of a cam 67, fast to the main driving-shaft 26. The cam-roll 66 is held against the periphery of said cam by a spring 68, one end of which is fastened to the arm 63, the other to the frame 15, so that the separator and carrier 42 is moved toward the left, Fig. 1, or toward the raceway 30 by the spring 68, through the connection 61, connecting-rod 62, and arm 63, while said parts are moved toward the right and away from the raceway, Fig. 1, by the cam 67, through the roll 66 and cam-lever 65.

The operation of the device as a whole is as follows: Assuming the different parts to be in the position shown in Figs. 1, 2, 3, and 8 and the shaft 26 rotating in the direction of the arrow *a*, Fig. 1, it will be seen that the roll 66 will move down the incline 69 upon said cam, being held toward the left by the spring 68. The separator and carrier will thus be

moved toward the left, Fig. 1, or toward the right, Figs. 2 and 8, until the separator side 45 of the angular arm 44 is thrust between the lowermost hook 37 and the hook 36 immediately thereabove upon the raceway 30, as shown in Fig. 9, and the side 46 of the angular arm 44 is brought to bear with a yielding pressure by said spring 68 against the neck of the lacing-hook 37. The plunger 16 now descends, while the rack 49 remains stationary. Said plunger descending carries with it the separator and carrier 42, the rod 62 and connection 61 rocking to allow of this downward motion, and in its descent the gear 48 plays in the stationary rack 49 and is thus rotated in the direction of the arrow *b*, Fig. 3, or of the arrow *c*, Fig. 9. The rotation of the arm 44 moves the hook 37 downwardly past the lower end of the detent 38, said detent yielding to allow said hook to pass by said lower end, and the hooks 36 upon the raceway immediately descend and are caught by the lower end of the detent upon its return movement, said detent being actuated by the spring 40. By a continued downward motion of the plunger and raceway, together with the separator and carrier, said separator and carrier is rotated until the hook 37 is brought to a vertical position, as shown in Fig. 10. The hook is still held firmly in position upon the raceway-plate 31 by the separator and carrier 42. The lower side of the lug 56 now abuts against the upper end of the sleeve 53, and upon a further downward motion of the raceway and plunger the separator and carrier, and also the rack 49, are carried downwardly together, the sleeve 53 sliding in the recess 52 and the shank 50 sliding in the bushing 51, and the gear 48 and rack 49 being relatively stationary the rotary motion of the separator and carrier ceases and the lacing-hook is driven through the material 70 and is clenched in said material by the anvil 28, as illustrated in Figs. 4 and 5. This completes the setting of the hook in the material. The plunger now starts up, together with the raceway and rack and with the separator and carrier, and as it moves up enough to release the hook from the anvil—say one-sixteenth of an inch—the incline 71 upon the cam 67 comes in contact with the cam-roll 66 and rocks the arms 65 and 63 toward the right, Fig. 1, drawing the rod 62, connection 61, and separator and carrier toward the right in said figure and away from the raceway, thus releasing the hook 37 and leaving it perfectly free to be moved toward the right, Fig. 5, in readiness for the material to receive a new lacing-hook upon the next downward motion of the plunger. It will thus be seen that the operator has time to feed the material during practically the entire upward movement of the plunger and raceway. During the upward movement of the plunger the rack 49 and gear 48 move to-

gether until the shoulder 55 upon said rack abuts against the under side of the bushing 51, whereupon the upward motion of the rack will cease, and upon a continued upward motion of the plunger the segment 48 will be rotated in the opposite direction to that indicated by the arrow *b*, Fig. 3, until the parts assume the position indicated in Figs. 1 and 2. The operation hereinbefore described is then again repeated.

The advantages secured by my improved separator and carrier consist in the fact that the hook is carried from the vertical portion of the raceway around the quarter-bend by positive mechanism instead of being dependent upon gravity, and during said carrying of the hook it is held firmly in position by a yielding separator and is also held in its vertical position by said separator during the downward motion of the plunger and while it is being driven through the material. Again it will be noted that there is no danger of the hooks 36 upon the raceway coming in contact with the upper of the shoe while the hook 37 is being driven and thus injuring the surface of the upper. Another advantage is the length of time which the operator has in which to feed the stock during the upward movement of the plunger, and, finally, it will be noted that the separation of the lowermost hook on the raceway from the other hooks upon said raceway, the carrying of said lowermost hook from a horizontal to a vertical position, the holding of said hook in position while it is descending and passing through the material are all performed by one separator and carrier, which is held against said hook during the entire operation with a yielding pressure.

Having thus described my invention, what I claim, and desire by Letters Patent to secure, is—

1. In a machine of the character described, a raceway, a separator adjacent to and movable with said raceway, mechanism to move said separator toward and away from said raceway, and mechanism to rotate said separator.

2. In a machine of the character described, a raceway, a separator adjacent to and movable with said raceway, mechanism to move said separator positively away from said raceway and toward said raceway with a yielding pressure, and mechanism to rotate said separator.

3. In a machine of the character described, a plunger, a raceway fast to said plunger, a separator carried by said plunger, mechanism to move said separator toward and away from said raceway, and mechanism to rotate said separator.

4. In a machine of the character described, a plunger a raceway fast to said plunger, a separator carried by said plunger, mechanism to impart a reciprocatory motion to said sepa-

rator toward and away from said raceway and transversely of said plunger, and mechanism to rotate said separator.

5. In a machine of the character described,
5 a plunger, mechanism to impart a reciprocatory motion thereto, a raceway fast to said plunger, a separator journaled upon said plunger, mechanism to move said separator toward and away from said raceway, a gear fast to said
10 separator, and a rack supported upon the frame of said machine and meshing into said gear.

6. In a machine of the character described, a plunger, mechanism to impart a reciprocatory motion thereto, a raceway fast to said
15 plunger, a separator journaled upon said plunger, mechanism to move said separator toward and away from said raceway, a gear fast to said separator, and a spring-supported rack meshing into said gear.
20

7. In a machine of the character described, a plunger, mechanism to impart a reciprocatory motion thereto, a raceway fast to said plunger, a separator journaled upon said plun-
25 ger, mechanism to move said separator toward and away from said raceway, a gear fast to said separator, a rack supported upon the frame of said machine and meshing into said gear, and means fast to said plunger adapted to engage
30 said rack and impart a reciprocatory motion thereto.

8. In a machine of the character described, a plunger, mechanism to impart a reciprocatory motion thereto, a raceway fast to said
35 plunger, a separator journaled upon said plunger, mechanism to move said separator toward and away from said raceway, a gear fast to said separator, a spring-supported rack meshing into said gear, and an adjustable lug fast to
40 said plunger, adapted to engage said rack and impart a reciprocatory motion thereto.

9. In a machine of the character described, a raceway, a detent pivoted to said raceway and adapted to engage and support the lowermost hook of a column of hooks upon said raceway, a separator, mechanism to move said separator toward and away from said raceway, and mechanism to rotate said separator and remove said lowermost hook from engagement with said detent.

10. In a machine of the character described, a vertical raceway provided with a curved portion at the lower end thereof, a separator, a detent adapted to support the lowermost hook of a column of hooks upon said raceway, mechanism to move said separator toward said raceway into engagement with said lowermost hook, and mechanism to rotate said separator and carry said lowermost hook past said detent and around said curved portion of said
6 raceway.

11. In a machine of the character described, an anvil, a plunger, a vertical raceway fast to said plunger, provided with a bent portion at the lower end thereof, a separator journaled
6 upon said plunger, a detent adapted to support the lowermost hook of a column of hooks upon said raceway, mechanism to move said separator into engagement with said lowermost hook, mechanism to rotate said separator and carry said hook past said detent and around said quarter-bend from a horizontal to a vertical position, and mechanism to impart a reciprocatory motion to said plunger and raceway and drive said hook against said anvil.
7

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WARREN F. FRASER.

Witnesses:

CHARLES S. GOODING,
ANNIE J. DAILEY.