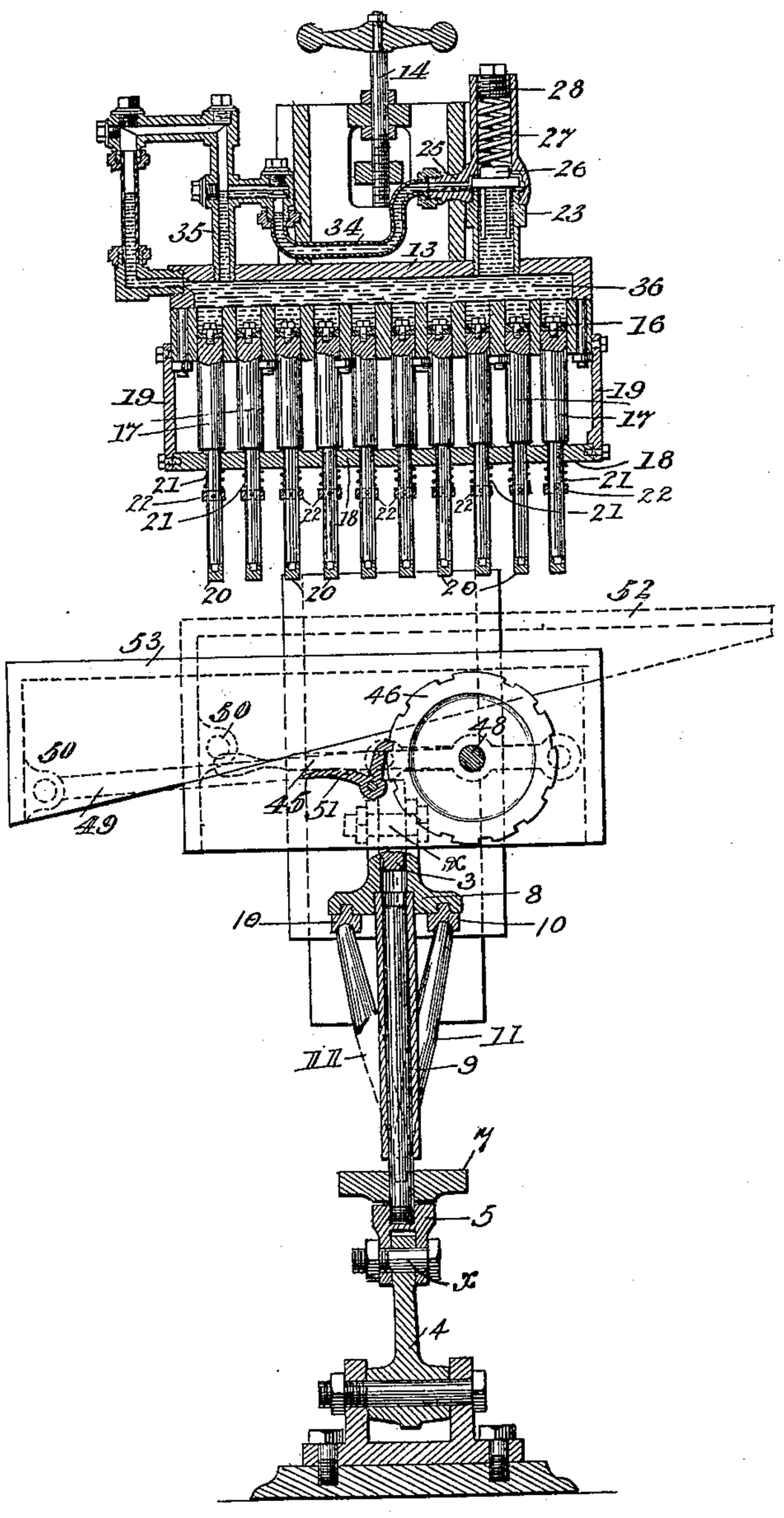
(No Model.) 4 Sheets—Sheet 1.

F. RAYMOND.

CARTRIDGE LOADING AND CRIMPING MACHINE.

No. 602,143. Patented Apr. 12, 1898.

Fig. 1.



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(No Model.) 4 Sheets—Sheet 2.

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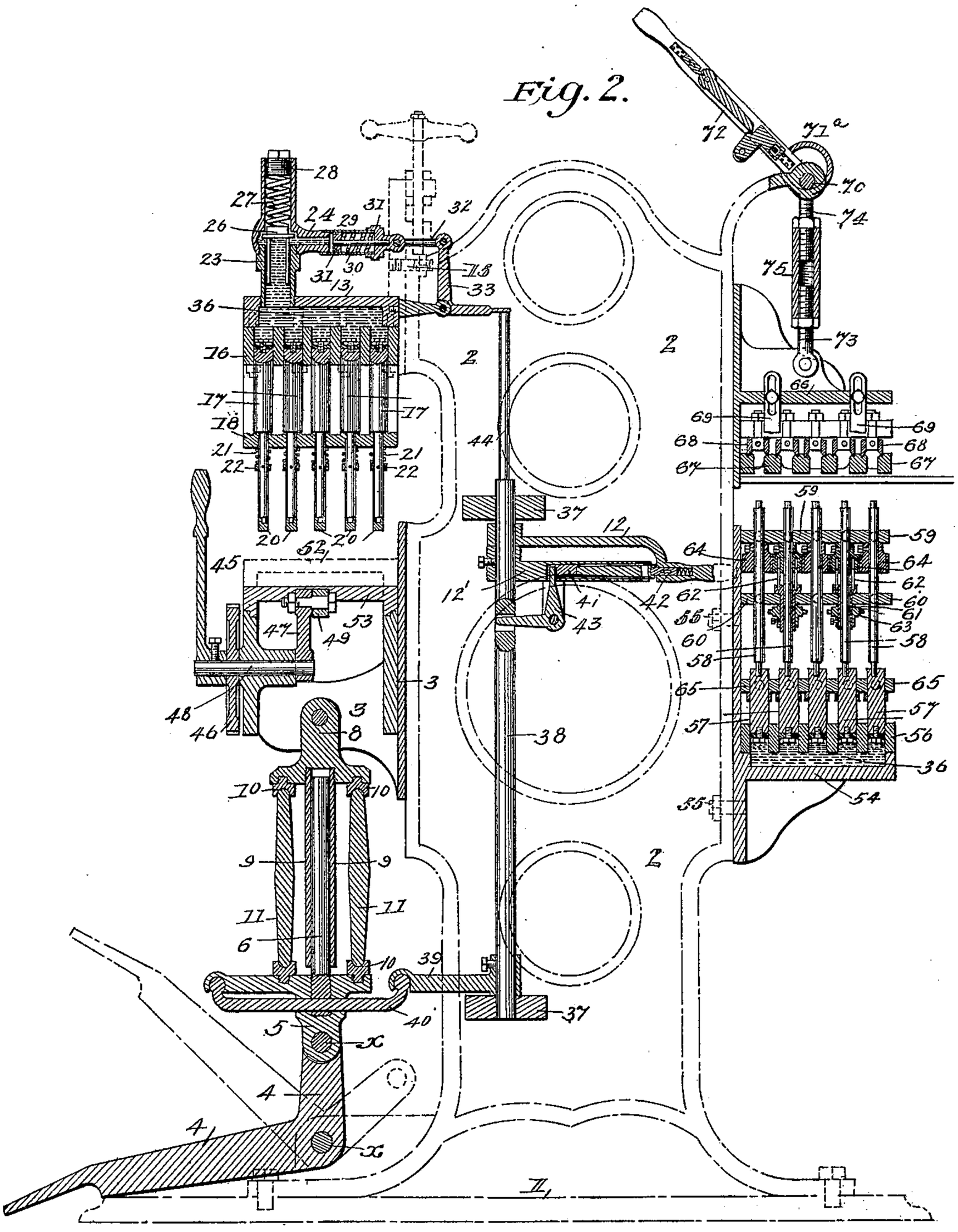
CARTRIDGE LOADING AND CRIMPING MACHINE.

No. 602,143. Patented Apr. 12, 1898.

Fig. 2.



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CARTRIDGE LOADING AND CRIMPING MACHINE.

No. 602,143. Patented Apr. 12, 1898.

Fig. 3.

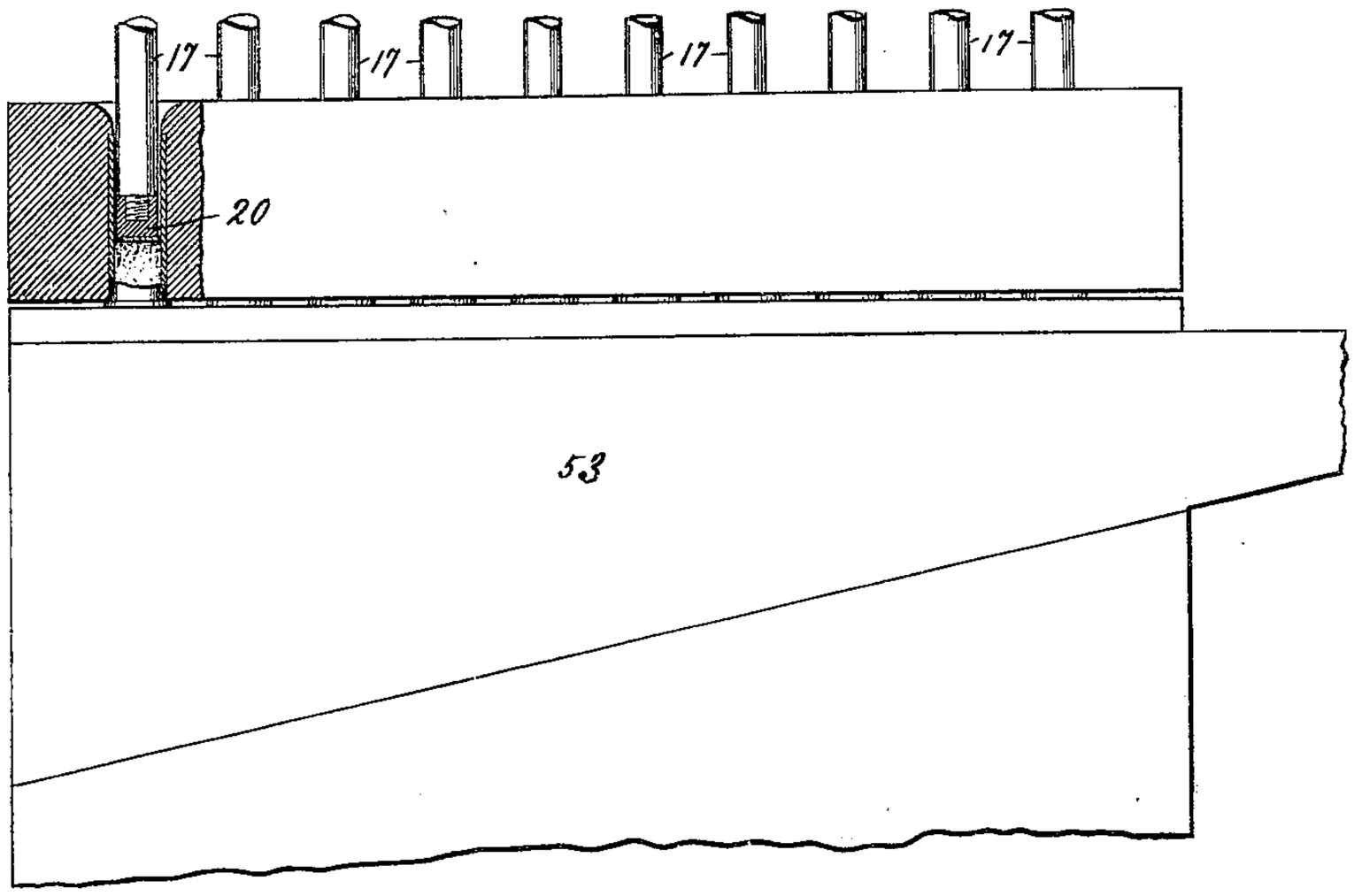
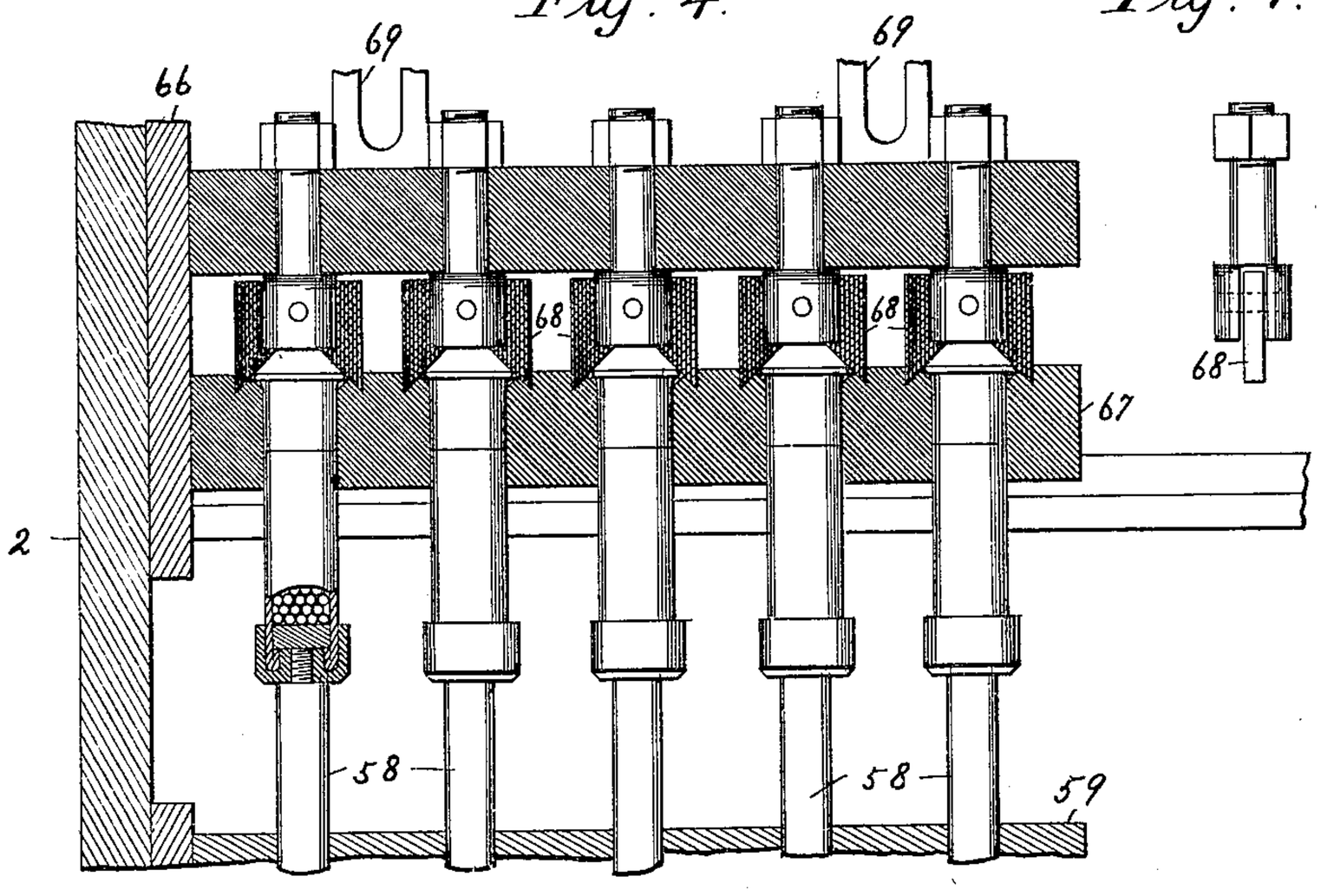


Fig. 4.

Fig. 4a



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(No Model.) 4 Sheets—Sheet 4.

F. RAYMOND.

CARTRIDGE LOADING AND CRIMPING MACHINE.

No. 602,143. Patented Apr. 12, 1898.

Fig. 5.

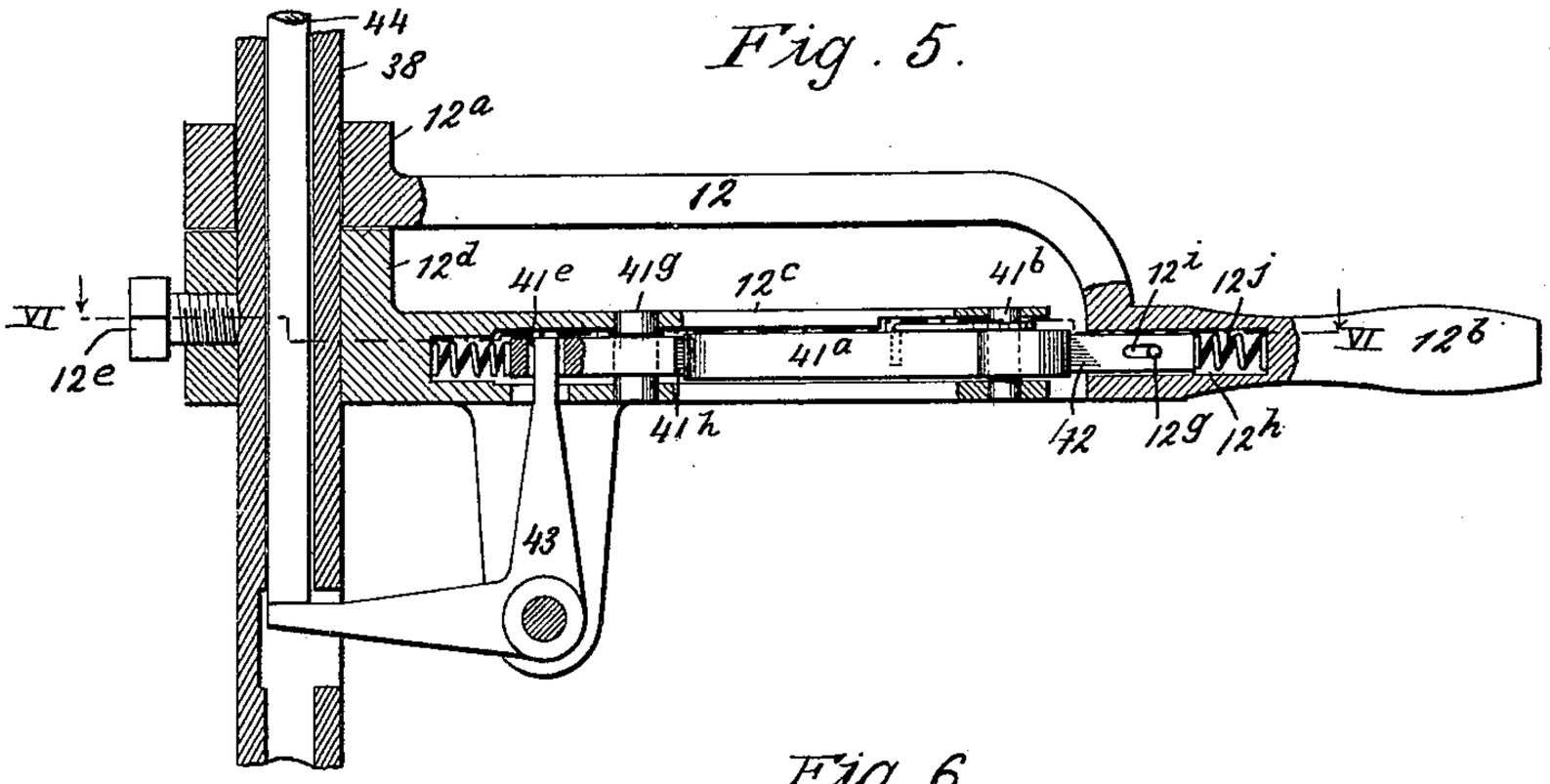


Fig. 6.

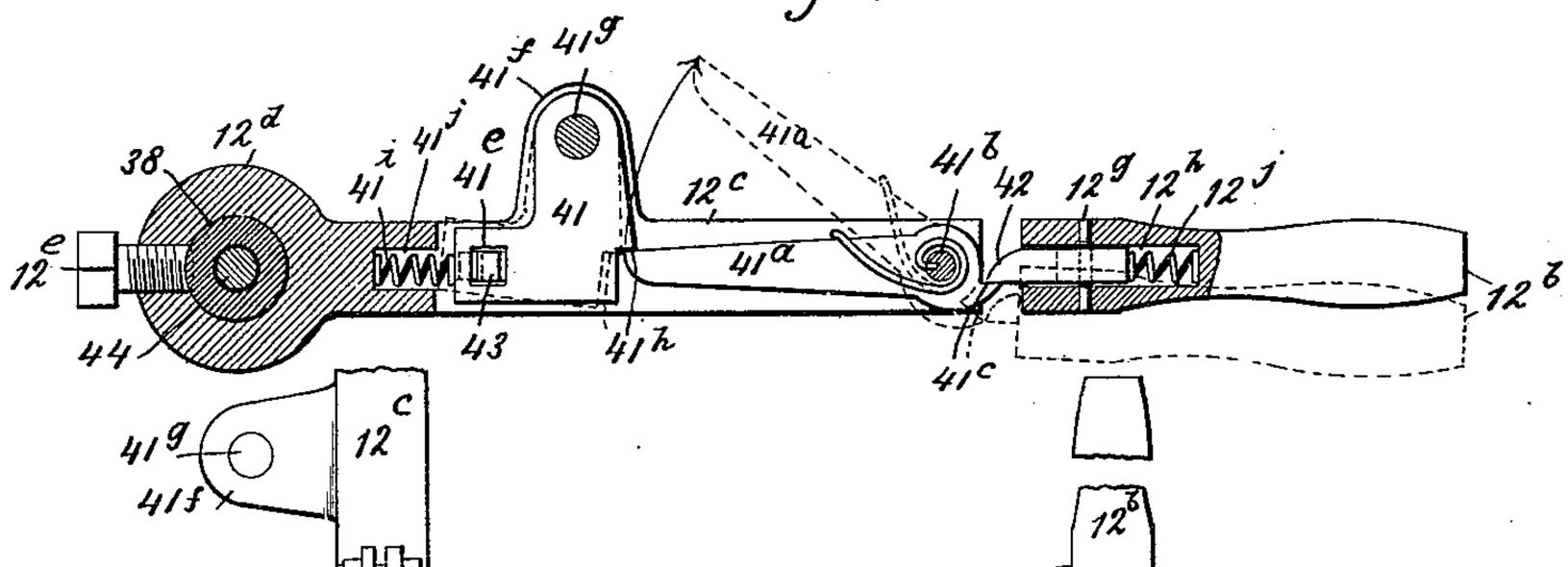


Fig. 8.

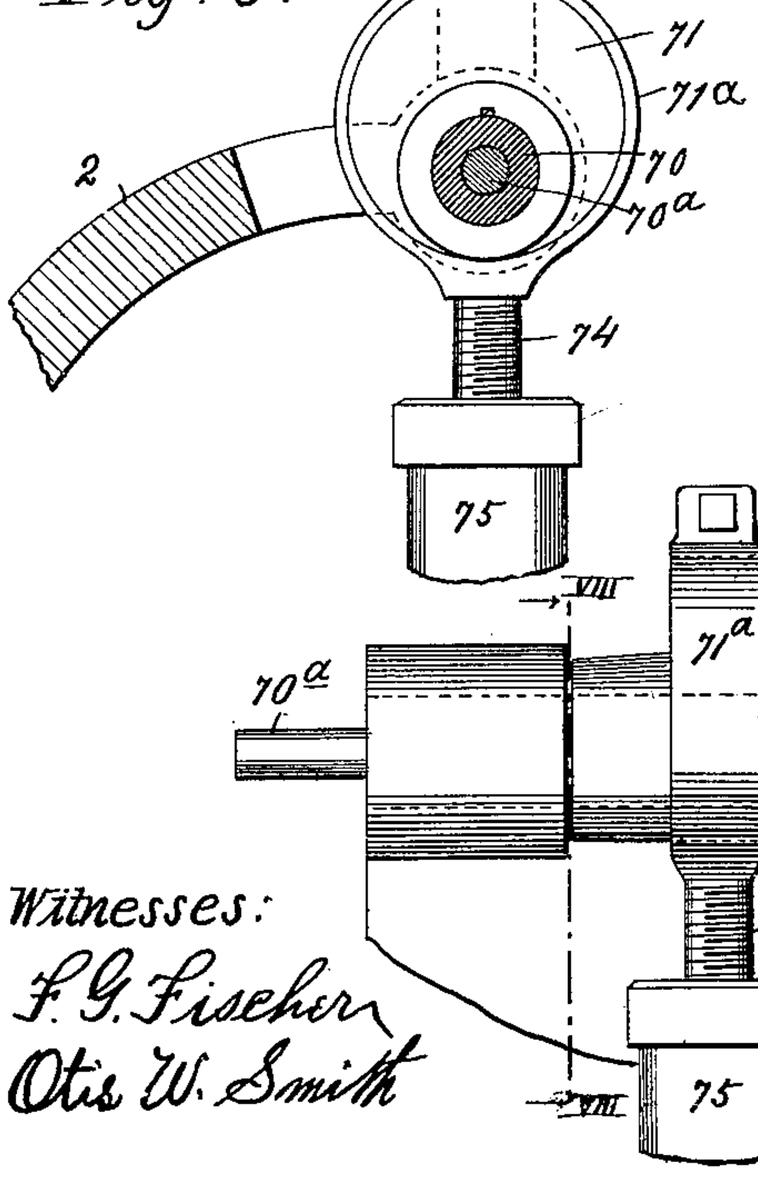
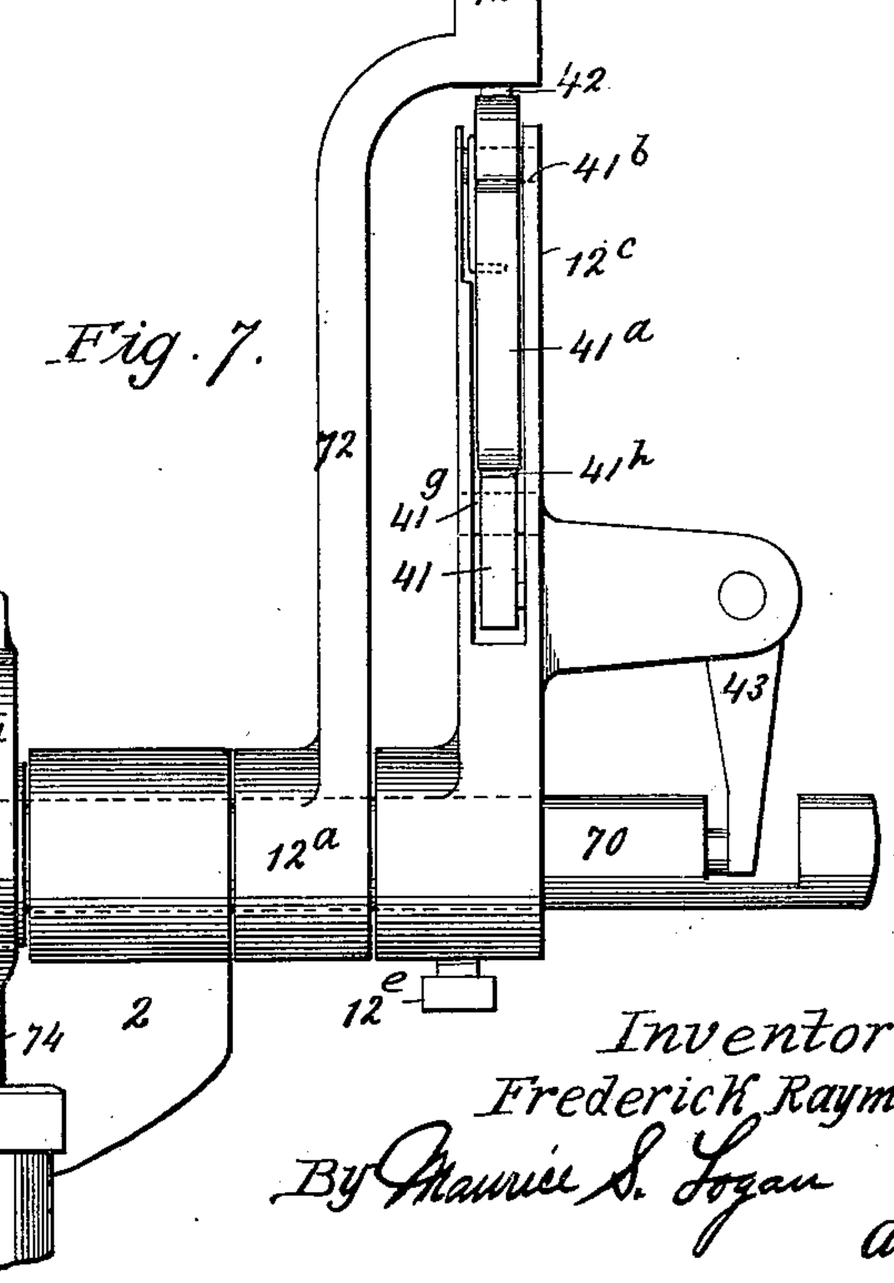


Fig. 7.



Witnesses:
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By Maurice S. Logan
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UNITED STATES PATENT OFFICE.

FREDERICK RAYMOND, OF SEDALIA, MISSOURI.

CARTRIDGE LOADING AND CRIMPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 602,143, dated April 12, 1898.

Application filed September 7, 1897. Serial No. 650,860. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK RAYMOND, a citizen of the United States, residing at Sedalia, in the county of Pettis and State of Missouri, have invented a new and useful Machine for Loading and Crimping Gun-Shells, of which the following is a specification.

My invention relates to improvements in machines for hand loading and crimping gun-shells, in which a loading-block is used, by means of which a number of shells are loaded simultaneously; and the objects of my invention are, first, to equalize the pressure on each and every shell alike, and, second, to automatically and instantaneously release the pressure as soon as the desired pressure is attained. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view of the loading device in cross-section. Fig. 2 is an end view of the machine in cross-section, showing the loading device on the left and the crimping device on the right. Fig. 3 is a side elevation of the sliding table, with a loading-block thereon partly in section, to show the operation of the rammers. Fig. 4 is a vertical cross-section of the upper portion of the crimping mechanism, showing the crimping-block with the loaded shells assembled therein. Fig. 4ª is an edge view of one of the steel forks and its connections. Fig. 5 is a side elevation, partly in section, of the hand-lever used for raising the carriage. Fig. 6 is a longitudinal section of same, taken on line VI VI of Fig. 5, the operation of the lever and latch being shown by dotted lines. Fig. 7 is a broken front elevation of the mechanism employed for raising and lowering the crimping-block. Fig. 8 is a detail of the eccentric forming part of the mechanism for raising and lowering the crimping-block.

Similar numbers refer to similar parts throughout the several views.

2, Fig. 2, is the supporting-frame.

3 3, Figs. 1 and 2, is the carriage, which slides vertically on the frame 2.

4 is a bell-crank foot-lever with fulcrum at base of frame. The head 5 is connected to the short arm of said bell-crank. The rod 6 is screwed into the top of the head 5. The plate 7 rests on the head 5 and fits loosely over the rod 6, so as to be free to rotate thereon. The combined head and plate 8 has its upper end forked, as shown in Fig. 1, and fits over the lower part of the carriage 3 and is secured thereto by means of a bolt. The tube 9 is screwed into the bottom of the head or plate 8 and fits loosely over the rod 6. The steel heads 10 10 10 10 are screwed into the plates 7 and 8 and fitted to receive the posts 11 11.

The carriage 3 is provided on its upper side with an inclined track, as shown in Fig. 1, which supports a sliding table or top 53, adapted to slide on said track. The position of the table is controlled by the lever 45 and held by the ratchet-wheel 46. The lever 45 and the ratchet-wheel 46 and the arm 47 are fastened to and turn with the shaft 48. The rod 49 connects the arm 47 to the end of the sliding table at the lug 50, Fig. 1. The dog 51 for holding the ratchet-wheel 46 at rest is secured to the frame of the carriage 3. The sliding table is shown in its lowest position at 53, while its highest position is shown in dotted lines at 52. By this means the main carriage 3 will always be in the same position when the heavy pressure is applied and still allow the top or table to be adjusted to right position for putting in the wads and pressing them down. In loading common shells the loading-block, (shown in Fig. 3,) which rests on the table 52, will have to drop to three different positions for the two felt wads and the shot-load, so that when the pressure is applied the carriage 3 will come to the same position each time.

The loading-block used is the same as those in common use and is placed on the sliding table, underneath the rammers, and operates in the usual way.

The plate 7 is provided with an extension or arm, as shown in Fig. 2. One end of the rod 40 is attached to the end of said arm by means of a ball-and-socket joint, and the other end of the rod 40 is attached to the end of the arm 39 also by a ball-and-socket joint. The arm 39 is attached to and turns with the shaft 38, and the shaft 38 is turned by the hand-lever 12.

37 37 are brackets fastened to the frame 2 to hold the shaft 38.

Fig. 2 shows the carriage 3 in its highest

position, the posts 11 11 being upright and the foot-lever 4 down. To lower the carriage 3, the hand-lever 12 is turned around backward horizontally about one quarter-turn, turning the shaft 38, and turning the arm 39 around forward one quarter-turn, describing a quadrant. The arm 39, being connected to the arm of plate 7 by the rod 40, imparts to it the same movement, thus causing the plate 7 to make one quarter-turn about the rod 6 and carrying the lower ends of the posts 11 11 around with it, thus bringing said posts from nearly a vertical into an oblique position and lowering the carriage 3 till the tube or sleeve 9 comes down and rests on plate 7 and supports the weight of said carriage. This is as far as the lever 12 affects the movement of the carriage 3. The foot-lever 4 may now be raised to the position shown by dotted lines. This will bring the carriage 3 down still lower. (The ball-joints at the ends of the rod 40 allow the plate 7 to drop below the level of the horizontal plane in which the arm 39 turns.) The loading-block may now be placed on the sliding table 53 and the table adjusted. The foot-lever 4 is now pressed down, raising the carriage 3, with the sliding table and loading-block, into position for receiving the heavy pressure. The heavy pressure is applied by the hand-lever 12 by reversing the operation previously described—that is, the lever 12 is turned one quarter-turn forward to position shown in drawings. The arm 39 and the plate 7 will also be turned one quarter-turn back to the position as shown in drawings, and the posts 11 11 will be brought from an oblique to an upright position, raising the carriage 3 till the desired pressure is attained, when the pressure is automatically released, as will be explained hereinafter. The leverage thus obtained in bringing the posts 11 11 from an oblique into an upright position is very powerful. The pressure on each shell should be from sixty to eighty pounds. The pressure therefore on fifty shells, the capacity of the machine, as shown in the drawings, will be from three thousand to four thousand pounds and will therefore require powerful leverage. The leverage-power illustrated is only intended to show what I consider the most desirable form of leverage for the purpose.

13 is a reservoir for holding oil or alcohol and is connected to top of frame or stand 2 and made to be raised or lowered by screw 14 and held in position after being properly set by the bolts 15.

16 is a block of iron the same size as the reservoir and is bolted to the reservoir, having water-tight joint and having fifty holes drilled through it to receive the rammers 17, the holes to exactly correspond to the holes in the loading-block.

18 is a plate with holes drilled in it to act as guides for the bottom ends of the rammers 17 and is held in position by the plates 19 19, Fig. 1.

17 represents fifty rammers, with lower halves made small enough to go into a No. 16 shell, and are provided with small screws on their ends to admit of brass heads 20 being put on to fit larger shells. The top ends of the rammers are made to fit the holes in block 16 and have water-tight packing at top ends to keep the oil or alcohol from leaking out of reservoir 13. The rammers 17 also rest on the guide-plate 18 at their shoulders and can rise up as far as the oil in reservoir will allow, while the desired pressure is attained.

21 are springs to draw rammers back to position after the pressure is off.

22 are rings fitted to the rammers for bottom of springs 21.

23 is a valve-case that screws into the top of the reservoir 13 and is provided with two lateral projections or oilways, one of which is shown at 24, Fig. 2, and the other is shown at 25, Fig. 1. These oilways are at right-angles to each other.

26 is the main valve and is held down on the seat by spring 27. This spring is held down and regulated by the plug 28, that screws into the top of the case 23.

The oilway 24, Fig. 2, is connected to the cylinder 29, containing piston 30 and head 31. The rod 32 connects the piston 30 to the bell-crank 33.

The hand-lever 12 is made in two parts 12 12^c, the handle part being loose on the shaft 38 and the other part being fast to said shaft. The two parts are connected together by two latch-pieces 41 and 42.

43 is a bell-crank lever with the fulcrum connected to the lower or rigid part of the lever 12. The vertical arm of said bell-crank extends up into the latch-piece 41, and the horizontal arm of said bell-crank extends backward into the center of the shaft 38 through a slotted hole in said shaft.

44 is a rod extending into the hollow shaft 38, so that its lower end rests on the end of the horizontal arm of the bell-crank 43 and has its upper end connected to the horizontal arm of the bell-crank 33.

The hand-lever 12 is shown in detail in Figs. 5 and 6. The upper part 12 of the lever is provided with the hub 12^a, which fits loosely over the shaft 38 and is provided at the other end with the handle 12^b. The lower part 12^c of the lever is provided with the hub 12^d, which fits over the shaft 38 and is made fast thereto by the set-screw 12^e. The latch-piece 41 is pivotally connected to the lever 12^c between the jaws 41^f by the pin 41^g. It is provided with the shoulder 41^h for engaging the arm 41^a and is held normally against said arm by the spring 41^i. The latch-piece 41 is also provided with a square opening 41^c for receiving the upper end of the bell-crank 43. The latch-piece 42 is secured to the handle 12^b by the pin 12^g, passing through the slot 12^i. It is held normally outward by the spring 12^j. The arm or lever 41^a is pivotally connected to the lever 12^c by the pin 41^b and

is adapted to engage the latch-piece 41 at one end and the latch-piece 42 at the other. When the above parts are in their normal positions, as shown by the solid lines in Fig. 6, the two parts 12 and 12ᶜ are locked together, so as to form practically one lever. Now if the horizontal arm of the bell-crank 43 is pressed downward by the rod 44 the vertical arm of said bell-crank will draw the latch-piece 41 back until it becomes disengaged from the arm 41ᵃ. Said arm will then swing out, as indicated by the arrow, until its other end becomes disengaged from the latch-piece 42. The part 12ᶜ is then released from the part 12.

The action of this device is as follows: When the pressure is put onto the rammers 17 by raising the carriage 3 with the hand-lever 12, as already explained, and when the pressure comes up to the point at which the spring 27 is set, the valve 26 will rise, allowing the oil to flow through the oilway 24 into the cylinder 29, forcing the piston 30 out. This motion is communicated through the bell-crank 33, the rod 44, and the bell-crank 43 to the latch-piece 41, drawing it back, and thus unlatching the two parts of the lever 12, allowing the part of lever 12 that is fast to the shaft 38 to fly back with the shaft, while the loose part of said lever will remain in the hand. The object of this arrangement is to get the same pressure on each and every shell alike, and while the oil in the reservoir will equalize the pressure on the separate rammers the valve 26 will, by the automatic arrangement for unlatching the lever 12, control the amount of pressure on each block full of shells, so it will be impossible to get any more pressure on the shells than the spring 27 is set for. The ducts 25, 34, and 35 form a passage-way for draining the oil in the cylinder 29 back into the reservoir after the pressure is released and the valve 26 is forced back onto its seat by the spring 27. The oil in the cylinder 29 then escapes back through the oilway or duct 24 into a groove in the valve-casing around the valve 26 into the duct 25 and thence through the duct 34. Then it passes through a check-valve into the duct 35, whence it flows back into the reservoir.

On the right of Fig. 2 is shown an end view of the crimping-machine, showing five rows of crimpers, each row being ten deep, making fifty crimpers corresponding to the fifty rammers.

54 is a reservoir for holding oil or alcohol and is bolted to the frame 2 by the bolts 55 55.

56 is a block which fits on top of the reservoir and is bolted thereto to form a water-tight joint and has fifty holes drilled through it to receive the plungers 57.

57 represents fifty plungers fitted to the holes in block 56 and having water-tight packing at end to rest on top of oil and are bored at their upper ends to receive the lower ends of the crimper-spindles 58.

58 are fifty spindles fitted at lower ends to turn in the plungers 57 and have screws at upper ends to receive crimper-heads.

59 is a plate with fifty holes drilled in it for boxes for upper ends of the spindles 58. Said plate is held in position by end plates similar to those shown at 19, Fig. 1.

60 is a plate with fifty holes through which the said spindles pass. A number of these holes are made large enough to receive brass sleeves 61, two of which are shown in the drawings. These brass sleeves are made to fit loosely over the spindles 58. The top ends of said sleeves are provided with collars to hold the driving-pins 62. Said sleeves also extend through the plate 60 far enough to receive the sprocket-wheels 63, which are made fast to said sleeves by set-screws and are driven by chain from suitable machinery.

64 are fifty spur gear-wheels fastened to the spindles 58 with set-screws. The spur gear-wheels that are directly over the sleeves 61 have holes bored in them to receive the driving-pins 62.

65 is a plate with fifty holes drilled in it to receive the upper ends of the plungers 57, forming guideways therefor.

The action of this device in driving the crimpers is as follows: The sprocket-wheels 63 are driven by chain (not shown in the drawings) and rotate the sleeves 61 and by means of the driving-pins 62 also rotate the spur gear-wheels 64, that are on the same spindles. These in turn rotate the other spur gear-wheels 64, and the said spur gear-wheels being fast to the spindles 58 rotate the said spindles. By the use of the driving-pins 62 the spindles 58 are free to move up or down while being rotated and will equalize and adjust themselves to the loaded shells and will also be free to force the plungers 57 down onto the equalizing fluid 36.

66 is a carriage that slides vertically on the frame 2.

67, Figs. 2 and 4, is a block with fifty holes bored in it for holding the loaded shells while being crimped, the holes being flared at the top to receive the flange of the shell. The said block is also slotted across the top at the holes deep enough to receive the steel forks 68, which have beveled inside edges made sharp to cut into the flanges of the shells to keep them from turning while being crimped.

69 69 are pieces for holding the crimping-block 67 up to the carriage-plate 66.

70 is a hollow shaft at top of the frame 2.

71 is an eccentric on the shaft 70.

72 is a hand-lever for pressing the crimper-block 67 down onto the crimpers.

73 and 74 are rods with right and left threads cut on same and screwed into the sleeve 75. The rod 73 is connected to the carriage 66, and the rod 74 is connected to the eccentric-strap 71ᵃ, Figs. 7 and 8. The eccentric 71 is rotated by means of the lever 72.

36 is the oil in the reservoirs.

The hand-lever 72 (see Fig. 7) may be made

similar to the hand-lever 12, (shown in Figs. 5 and 6,) similar numbers corresponding to similar parts, and the rod 70^a in Figs. 7 and 8 corresponding to the rod 44 in Figs. 5 and 6; also, the reservoir of the crimping-machine may have a valve for controlling the pressure similar to the valve 26 for controlling the pressure in the loading-machine and may also have similar connections for automatically releasing the lever 72 similar to the connections for releasing the lever 12.

Having fully described my invention in the foregoing drawings and specification, what I claim as new and useful, and desire to secure by Letters Patent, is—

1. In a machine for loading or crimping gun-shells, the combination with a loading or crimping block capable of holding a number of gun-shells in position to be loaded or crimped simultaneously, a corresponding number of rammers or crimpers, each capable of an independent longitudinal movement, means for pressing the shells against said rammers or crimpers, and a fluid for equalizing the pressure on said rammers or crimpers, all substantially as and for the purpose set forth.

2. In a machine for loading gun-shells, the combination of a loading-block capable of holding a number of shells in position to be loaded simultaneously, a corresponding number of rammers, each capable of an independent longitudinal movement, a fluid for equalizing the pressure on said rammers, a lever for applying the pressure, and means for automatically releasing said lever as soon as the desired pressure is attained, all substantially as shown and described.

3. The combination of the rammers 17, the fluid 36 for equalizing the pressure on said rammers, the valve 26 capable of being opened by the pressure of said fluid when the desired pressure is attained, the piston 31 capable of being acted upon by said fluid after it has passed through said valve, the movable carriage 3 for the loading-block, the shells therein, the lever 12 for moving said carriage so as to press the shells against said rammers, and means controlled by the movement of said piston for releasing said lever, all substantially as shown and described.

4. In a machine for loading gun-shells the combination of the equalizing fluid 36, the rammers 17 capable of acting independently as plungers against said fluid, the valve 26 capable of being opened by the pressure of said fluid when the desired pressure is attained, the piston 31 capable of being acted upon by said fluid after it passes through said valve, the hand-lever 12 provided with a releasing-lock operated by the movement of said piston, for the purpose of releasing said lever, when the desired pressure is attained, the carriage 3 capable of being moved by said lever so as to press the shells against said rammers, and the adjustable table 53 for the purpose of adjusting the shells for receiving the different charges, substantially as shown and described.

5. The combination of the rammers 17, the equalizing fluid 36, the valve 26, the piston 31, the rod 30, the bell-crank 33, the rod 44, the bell-crank 43, the lever 12 provided with a releasing-lock consisting of the latch-pieces 41 and 42 the shaft 38 with its arm 39, the connecting-rod 40, the plate 7, the posts 11, 11, and the carriage 3 all adapted to act automatically substantially as and for the purpose shown and described.

FREDERICK RAYMOND.

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