No. 612,864. Patented Oct. 25, 1898.

W. L. MORRIS.

SHELL LOADING MACHINE.

(Application filed Jan. 11, 1898.)

(No Model.) 3 Sheets—Sheet 1.

FIG. 1.

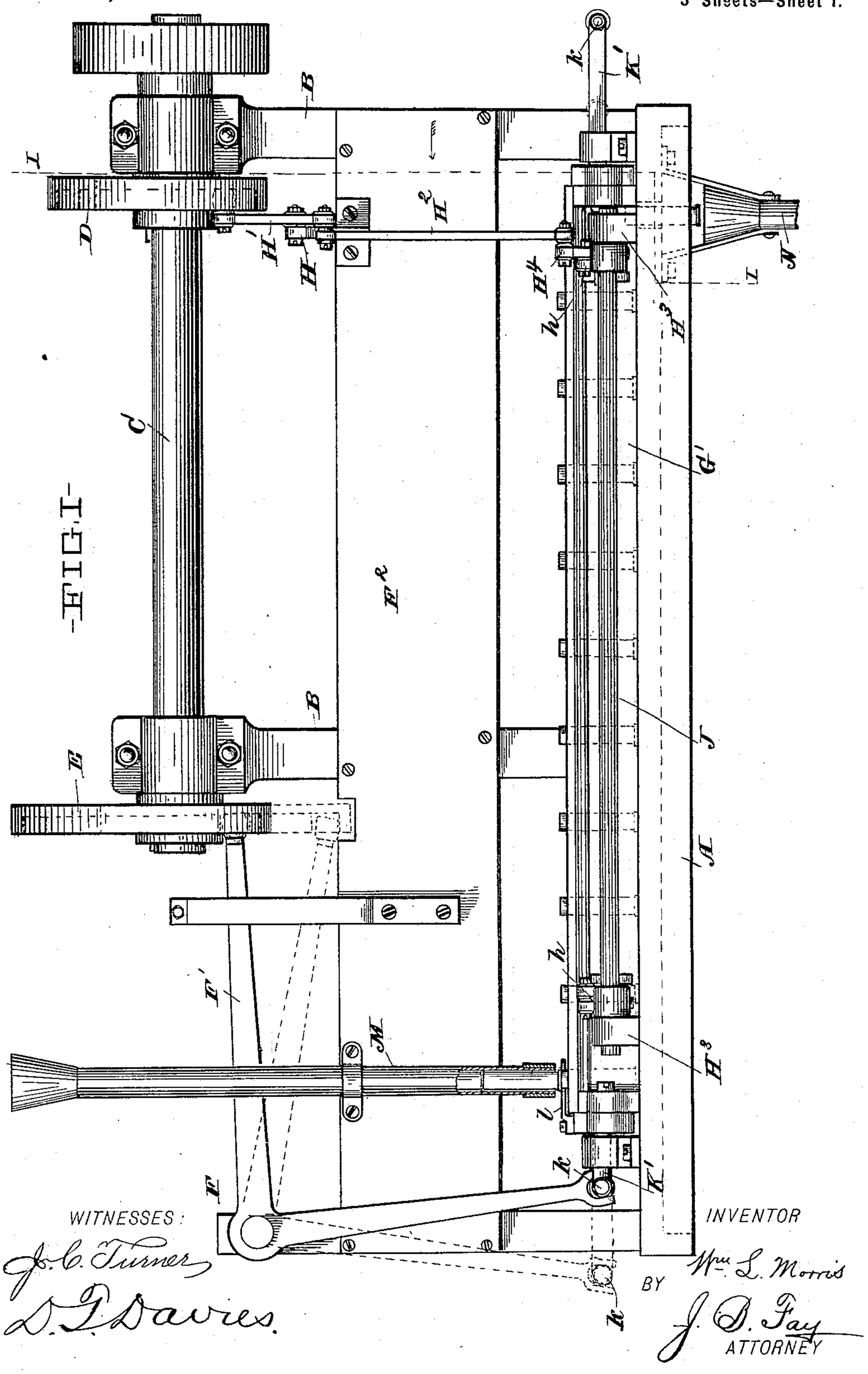

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FIG. II.

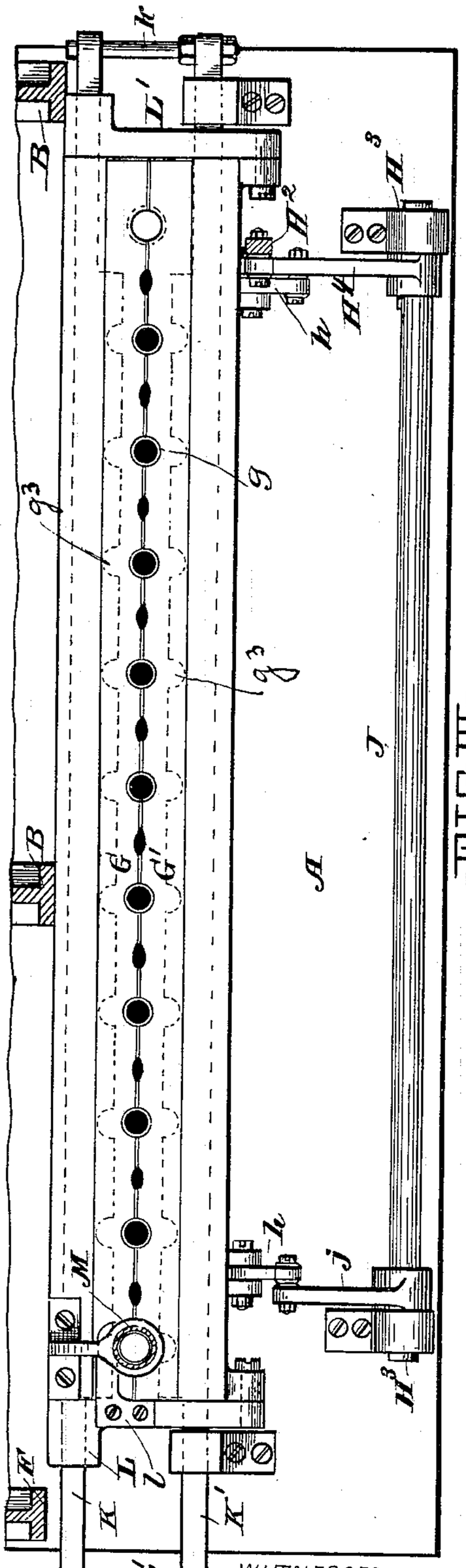

FIG. III.

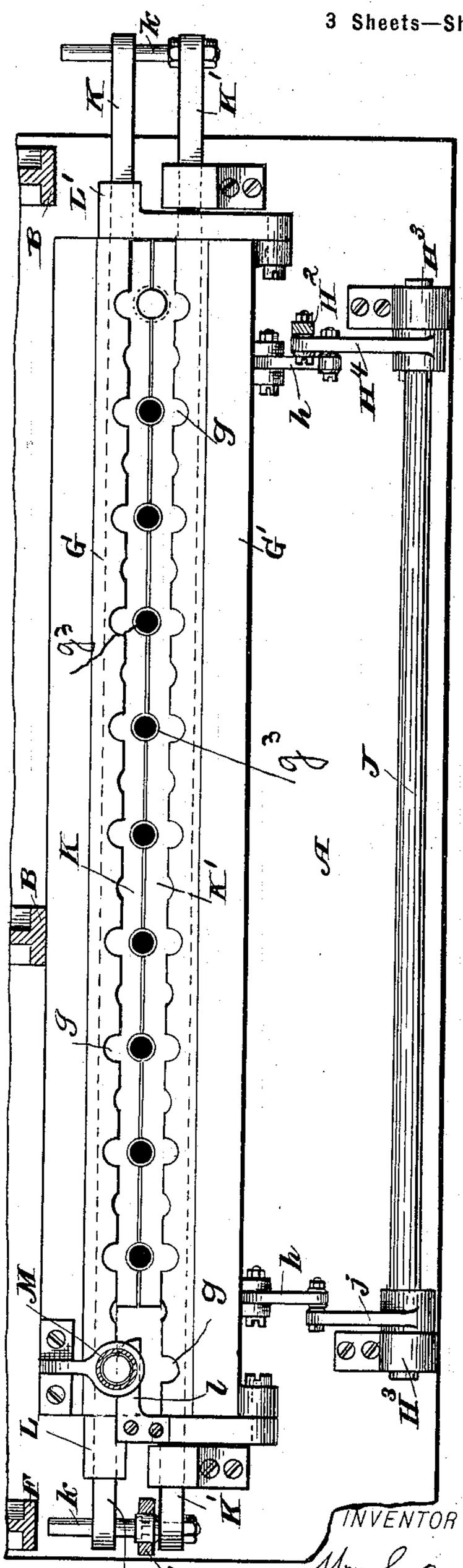

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FIG. IV.

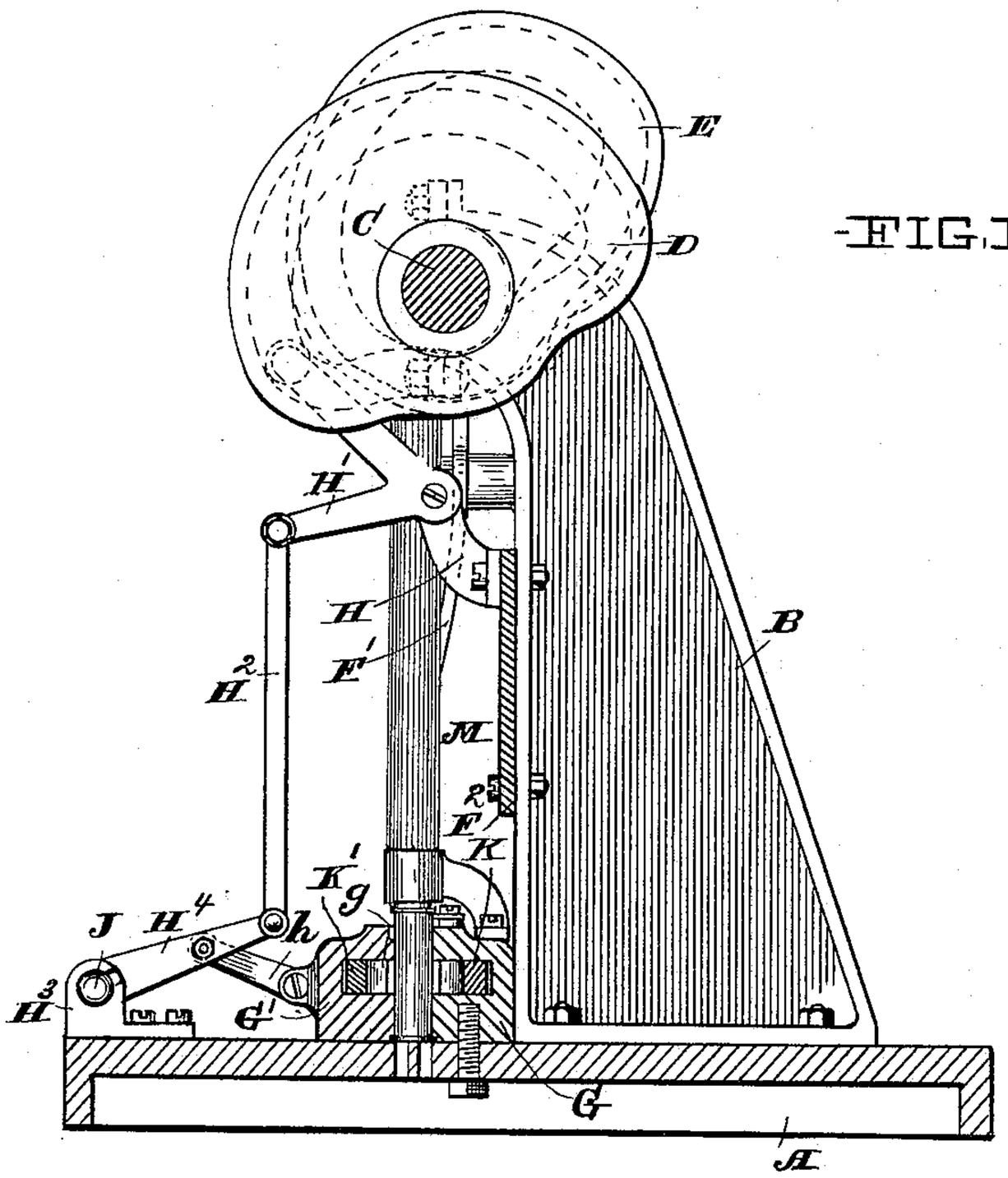


FIG. V.

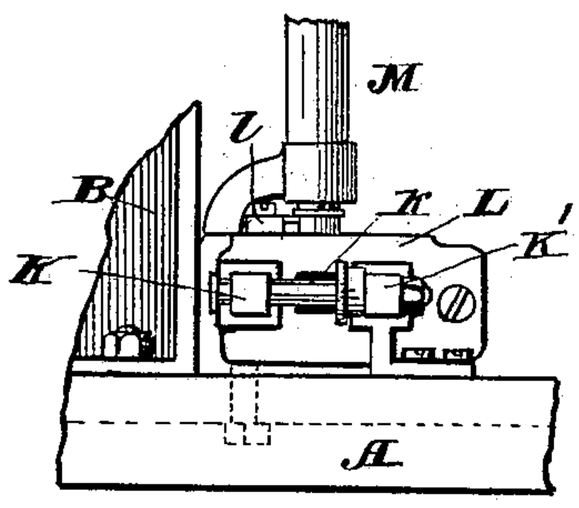
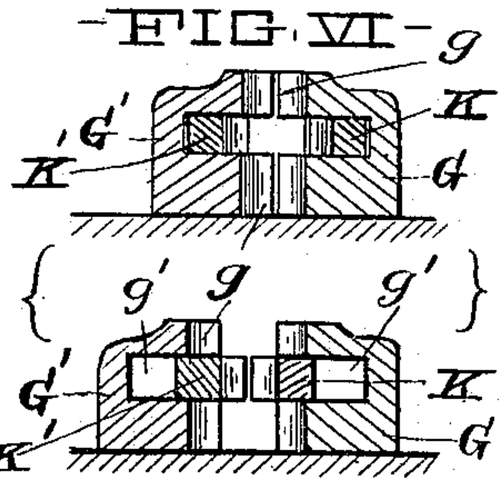


FIG. VI.



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UNITED STATES PATENT OFFICE.

WILLIAM L. MORRIS, OF CLEVELAND, OHIO, ASSIGNOR TO THE AUSTIN CARTRIDGE COMPANY, OF SAME PLACE.

SHELL-LOADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 612,864, dated October 25, 1898.

Application filed January 11, 1898. Serial No. 666,317. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. MORRIS, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Conveyers for Cartridge-Loading Machines, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to an improved cartridge-loading machine; and it consists of the features hereinafter described and claimed.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting but one of various mechanical forms in which the principle of the invention may be used.

Referring to the drawings, Figure I is a front view of the machine; Fig. II, a plan view showing the conveyer-bars open; Fig. III, a plan view showing the conveyer-bars closed and the shell-clamps open. Fig. IV is a sectional end view on line 1 1 of Fig. I, looking in the direction of the arrow. Fig. V is a detail view of the lower end of the shell-feeding tube and conveyer-bar connection; and Fig. VI are detail sectional views looking in a direction opposite to that shown in Fig. V, the upper view showing the clamps shut and the conveyer-bars open and the lower view showing the clamps open and the conveyer-bars closed.

The bed of the machine A is supported in any suitable manner and is provided with the uprights B. Journaled in said uprights B is the shaft C, which is provided on one extremity with the usual pulley-wheel. Cams, respectively D and E, are secured on said shaft near the respective uprights. A third upright F is secured at one end of the machine, and to this is pivoted a bell-crank F′, the upper arm of which engages with and derives motion from the cam E. A horizontal bar F^2 extends the length of the machine and is secured to said uprights. A pair of shell-clamps, respectively G and G′, rest upon said bed-plate A, said clamp G being rigidly secured to said bed-plate in any suitable manner, while the clamp G′ rests upon said bed-plate and is movable transversely thereof, as hereinafter described. Said clamps are respectively provided with shell openings or recesses *g*, formed between their adjacent edges, each clamp being formed with a half-circular opening on its edge registering with the half-circular opening formed in its opposite clamp. A suitable bracket H is secured to the front side of the horizontal bar F^2, and pivoted in said bracket is a bell-crank H′, the upper arm of which engages with the race in the cam D, its lower arm having pivotal engagement with pitman H^2.

On the front edge of the bed-plate are secured brackets H^3, and journaled in said brackets is shaft J. A lever H^4 is keyed to said shaft and has its opposite end pivoted to the lower extremity of lever H^2. Lever *h* connects lever H^4 with the front clamp G′. At the opposite end of the bed-plate lever *j* is keyed on said shaft near said second bracket and is connected with the front clamp by lever *h*. Each of said clamps is provided with longitudinal slots *g*′, extending the length of said clamps, and in said slots are respectively located conveyer-bars K and K′, adapted to have sliding movement therein. Pins *k* respectively connect the opposite extremities of said conveyer-bars and are respectively secured rigidly to the front conveyer-bar and pass through an opening in the back conveyer-bar, whereby relative longitudinal movement of the two conveyer-bars is prevented, but transverse movement is permitted. The front conveyer-bar is secured against transverse movement, while the back conveyer-bar is movable both longitudinally and transversely. The lower extremity of bell-crank F is secured to one of the pins *k*, thus connecting the conveyer-bars with the cam E. The opposite extremities of the back conveyer-bar respectively pass through the arms L and L′, that have their front ends secured in any suitable manner to the movable front clamp. Shell-feeding tube M is secured to the horizontal bar F^2 to supply the machine with shells, and attached to arm L is a cut-off *l*, that prevents the shells in the tube M from dropping into the conveyer-bars when

the front clamp is retracted. At the opposite end of the machine is the discharge-pipe N, into which the loaded shells drop and pass from the machine.

The conveyer-bars have half-circular openings g^3 formed along their meeting edges and registering with each other, thus forming shell-gripping openings, the number of such shell-openings being sufficient to permit all the different operations of loading shells to be performed at one time. The shells as they pass along from one opening to another may be loaded by hand, or automatic attachments may be applied to the machine herein shown, this machine merely showing the mode of feeding the shells and conveying them along the machine, so that the different operations of loading—including expanding the shell, inserting powder, the respective paper and felt wads, the shot and shot-wad, and crimping the wad—may be accomplished before the discharge is reached.

The operation of the machine is as follows: I will assume that the machine is in the position shown in Fig. II. The conveyer-bars are open and retracted to the full extent of their back movement. The shell-feeding tube M is supplied with the empty shells. The machine is connected to its power, which causes the shaft C to rotate. The clamps G and G′ are closed and the valve l is open, so as to permit the lower shell in the shell-feeding tube M to drop into position into the first clamp-opening g. Motion is transmitted by the cam D to the movable clamp G′ through the bell-crank H′, pitman H^2, levers H^4, j, and h, causing said movable clamp to be moved forward away from its contact with the shell that has just passed out of the shell-feeding tube M. As the said clamp moves forward the valve l, secured to the arm L, passes under the shell-feeding tube and closes the lower opening of said tube. The same motion causes arms L and L′ to be drawn forward, bringing with them in their forward motion the back conveyer-bar K into engagement with the front conveyer-bar and gripping the shell in the first opening g^3 of said conveyer-bars. Meanwhile the cam E is rotating and moves the bell-crank F′, causing it to force forward the conveyer-bars from the position shown in Fig. II to the position shown in Fig. III, carrying in their movement the shell, which has been gripped in said first opening g^3, and moving said shell into a position in line with the second shell-opening of the clamps. The movement of the bell-crank H′ continuing causes the front clamp to move toward the back clamp, and meanwhile by the same motion, by means of arms L and L′, attached to the front clamp and the back conveyer-bar, said conveyer-bars are being separated, freeing themselves from the shell. There is an instant of time during which the shell is free both from the clamps and the conveyer-bars. This is while the clamps are moving together and the conveyer-bars are being separated. As soon as the clamps are brought together the conveyers having been separated start on their return stroke to the position shown in Fig. II. As the front clamp moves rearward the valve l passes from under the tube M, thus permitting another shell to drop into the first clamp-opening to be gripped in its turn by the conveyer-bars after they have reached the limit of their return stroke and are again brought together. It will be noticed that the shells and shell-openings do not always occupy the same longitudinal plane, as the plane occupied by the clamp-openings is in line with the center of the tube M, so as to permit the lower shell as it drops from said tube to pass easily into the clamp-opening, while the conveyer-bar openings, when said conveyers are in closed position, are in front of said center line passing through tube M. The first or inlet and the last or outlet clamp-openings have a diameter in excess of the diameter of the shell, while the conveyer-shell openings and remaining clamp-openings are substantially of the same diameter as that of the shell to be loaded. The further operation of the machine alternately reciprocates the conveyer-bars longitudinally, thus carrying a shell from one opening to another until the first shell reaches the discharge-opening, and alternately with this longitudinal reciprocating motion is the transverse motion of the rear conveyer-bar, whereby the shells are gripped and carried forward, while the front clamp is reciprocated transversely to hold the shells in position while the conveyer-bars are being reciprocated longitudinally. When the first shell has reached the discharge-opening, it drops into the discharge-pipe N and is conveyed away to any suitable place.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means covered by any one of the following claims be employed.

I therefore particularly point out and distinctly claim as my invention—

1. The combination in a machine for loading shells, of shell-holding mechanism, shell-conveying mechanism arranged within but independent of said holding mechanism, and intermittent reciprocating mechanism connected with said holding and conveying mechanisms, substantially as set forth.

2. The combination in a machine for loading shells, of shell-holding mechanism, consisting of a fixed clamp and movable clamp, independent shell-conveying mechanism, reciprocating mechanism connected with the conveying mechanism, and reciprocating mechanism connected with said holding mechanism, said reciprocating mechanisms operating in two planes at right angles to each other whereby the said holding mechanism and the said conveying mechanism may be successively moved in planes at right angles to each other and whereby the conveying

mechanism may be also moved in a plane parallel with the plane of movement of the holding mechanism, substantially as set forth.

3. The combination in a machine for loading shells, of shell-holding mechanism, independent shell-conveying mechanism arranged within the holding mechanism, driving means, primary reciprocating mechanism connecting said shell-holding mechanism with said driving means, secondary reciprocating mechanism connecting said driving means with said conveying mechanism, said conveying mechanism also connecting with said primary reciprocating mechanism whereby the said holding mechanism and said conveying mechanism may be successively moved in planes at right angles with each other and said conveying mechanism may also be moved in a plane parallel with the plane of movement of said holding mechanism, substantially as set forth.

4. In a shell-loading machine, the combination with operating mechanism, of two parallel conveyer-bars, each provided with a series of shell-openings, said openings being adapted to register to grasp the shells, substantially as set forth.

5. In a shell-loading machine, two conveyer-bars each formed with a series of shell-openings, said openings being adapted to register, in combination with mechanism for moving said bars together longitudinally and also independently laterally, substantially as set forth.

6. In a shell-loading machine, the combination with two parallel coöperating conveyer-bars respectively provided with shell-registering openings, one of said bars movable transversely and longitudinally, the other bar movable longitudinally, substantially as set forth.

7. In a shell-loading machine, the combination with clamps provided with longitudinal conveyer-bar recesses, of conveyer-bars respectively located in said clamp-recesses, and means for imparting sliding movement to said conveyer-bars, substantially as set forth.

8. In a shell-loading machine, the combination of shell-clamps, one of which is adapted to have a transverse movement, reciprocating mechanism connected with said movable clamp, conveyer-bars arranged within the clamps, means for moving said conveyer-bars longitudinally, one of said conveyer-bars adapted to have a transverse motion, and reciprocating mechanism connected with said transversely-movable conveyer-bar, substantially as set forth.

9. In a shell-loading machine, the combination of shell-conveyer bars, locking mechanism connecting the two together whereby relative longitudinal movement is prevented, reciprocating means connected with said conveyer-bars whereby they may be moved longitudinally, and mechanism connected with one of said bars whereby it may be transversely reciprocated, substantially as set forth.

10. In a shell-loading machine, the combination of shell-conveyer bars, said bars connected together whereby relative longitudinal movement is prevented, a cam, a bell-crank mechanism connecting said cam and bars, substantially as set forth.

11. In a shell-loading machine, the combination of conveyer-bars, bell-crank mechanism connected with said bars, a cam connected with said bell-crank mechanism, a second cam, a shell-clamp connected with one of said conveyer-bars, and intermediate mechanism connecting said clamp and second cam, substantially as set forth.

12. In a shell-loading machine, the combination of two conveyer-bars, a pin rigidly secured to one bar and passing loosely through the second bar, whereby relative transverse motion is imparted and relative longitudinal movement prevented, and mechanism for operating said bars, substantially as set forth.

13. In a shell-loading machine, the combination of bipartite shell-clamps having shell-openings in their adjacent edges, one of said clamps movable toward and from the other, independent bipartite shell-conveyers arranged within the clamps and having shell-openings formed in their adjacent edges, one of said conveyers movable toward and from the other, and operating mechanism connected with said clamps and conveyers and adapted to successively move said clamps and conveyers, substantially as set forth.

14. In a shell-loading machine, the combination with operating mechanism, of two conveyer-bars, a fixed clamp and a movable clamp, said conveyer-bars arranged parallel with respect to each other and each provided with a series of shell-openings, said openings being adapted to register to grasp the shells, substantially as set forth.

Signed by me this 31st day of December, 1897.

WILLIAM L. MORRIS.

Attest:
D. T. DAVIES,
J. C. TURNER.