(No Model.)

3 Sheets—Sheet 1.

W. H. WHITEHEAD.

Cartridge Loading Machine.

No. 239,688. Patented April 5, 1881.

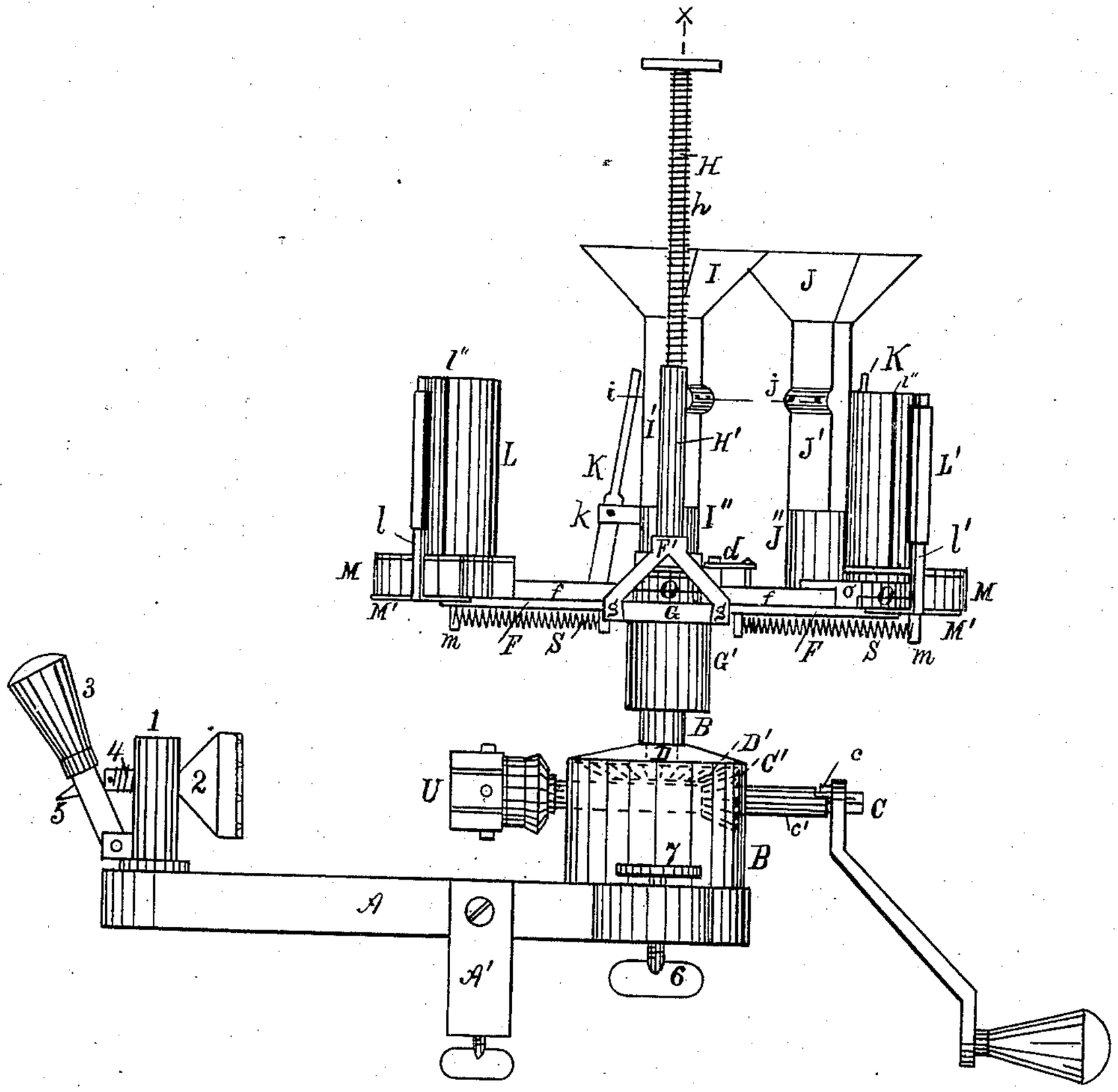

FIG., 1.

WITNESSES:

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Jas. S. Miller.

INVENTOR;

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PER. Jno. K. Hallock,

ATT'Y.

(No Model.)

3 Sheets—Sheet 2.

W. H. WHITEHEAD.

Cartridge Loading Machine.

No. 239,688. Patented April 5, 1881.

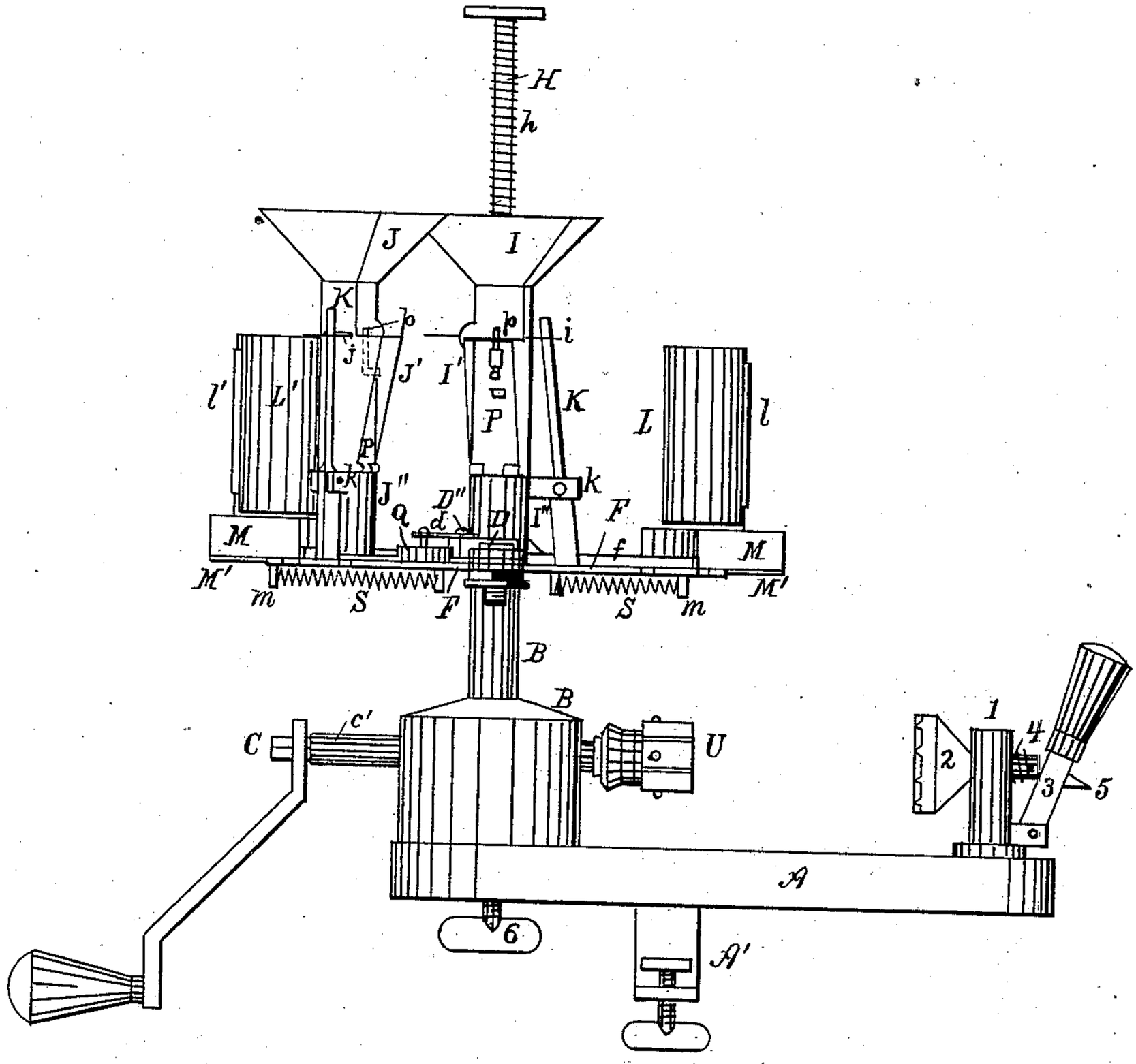

FIG. 2.

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(No Model.)

3 Sheets—Sheet 3.

W. H. WHITEHEAD.

Cartridge Loading Machine.

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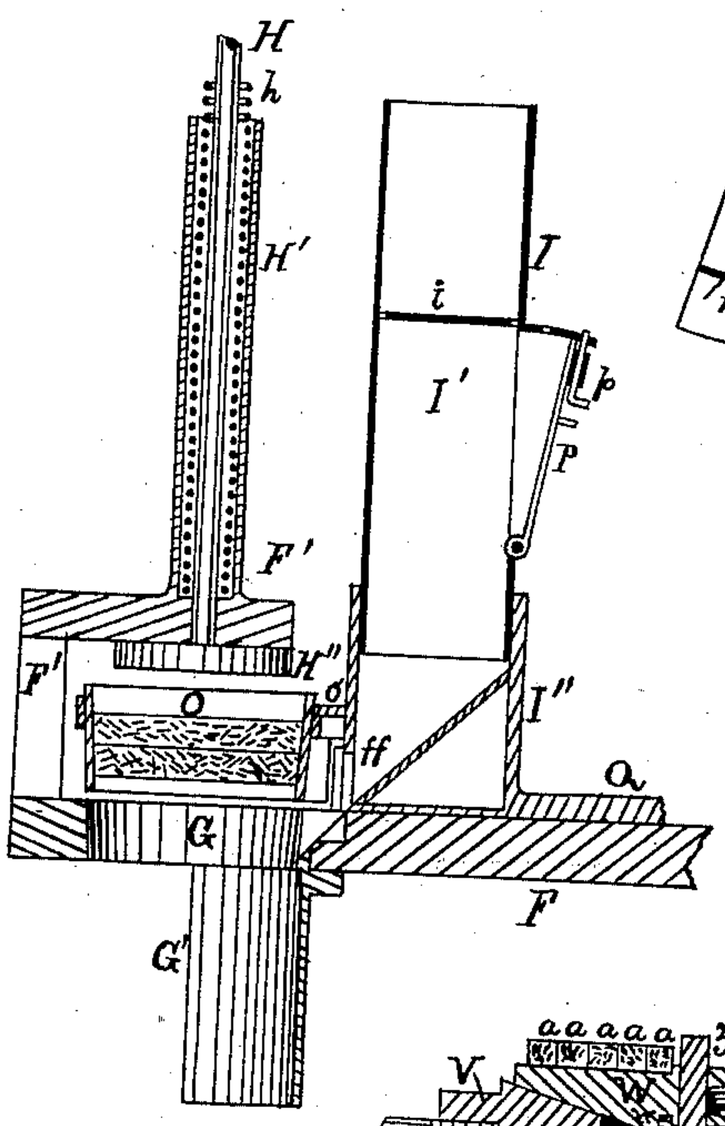
FIG. 4.



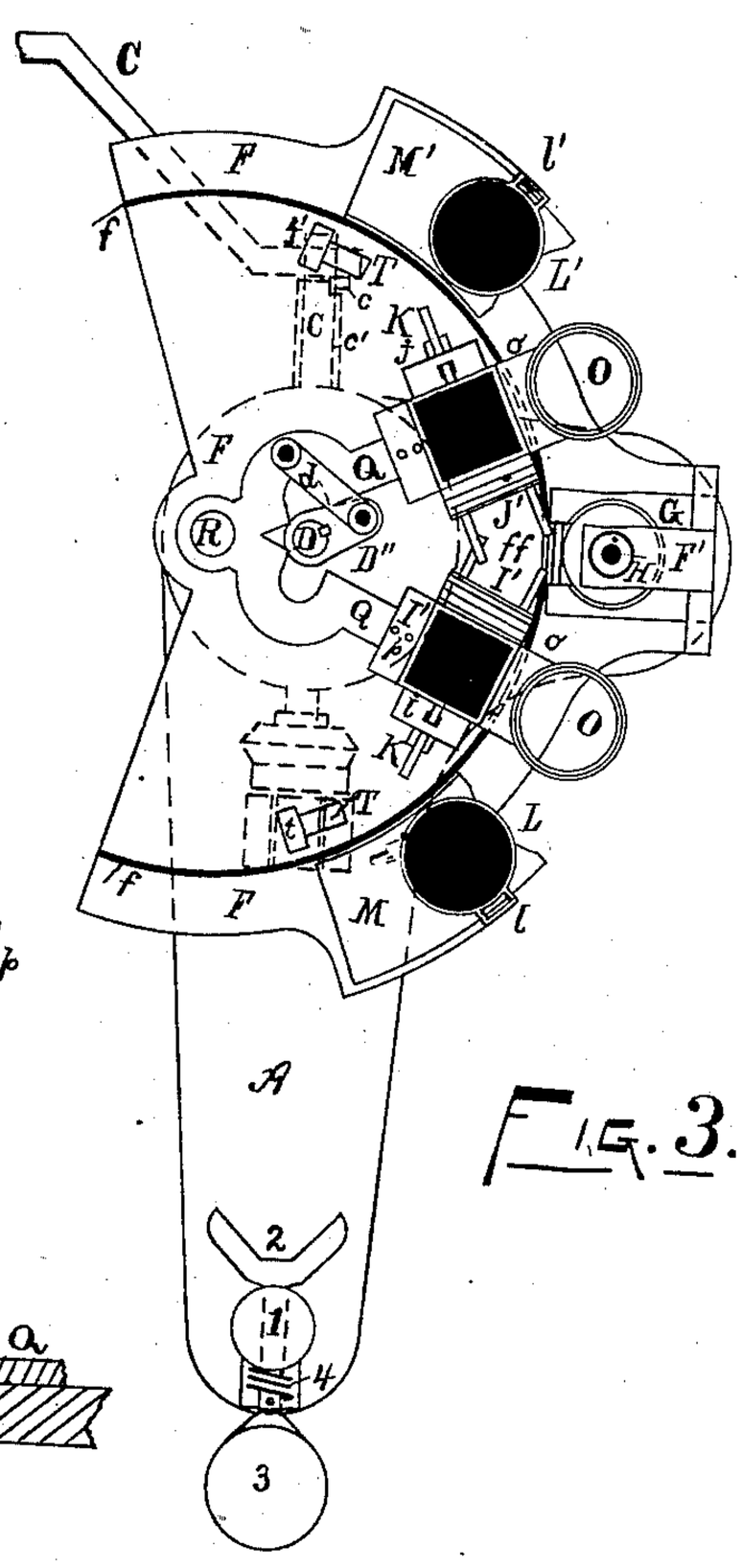


FIG. 3.

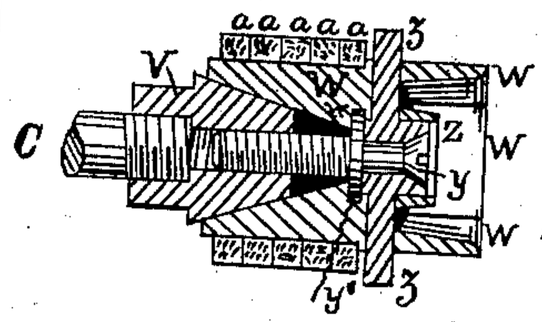


FIG. 5.

Witnesses,

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Atty.

UNITED STATES PATENT OFFICE.

WILLIAM H. WHITEHEAD, OF ERIE, PENNSYLVANIA.

CARTRIDGE-LOADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 239,688, dated April 5, 1881.

Application filed April 1, 1880. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. WHITEHEAD, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Cartridge-Loading Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to the construction of machines for preparing gun-cartridge shells for use, and consists in providing devices for cutting off the shell to proper length, filling the same with, first, powder, then a wad, or two wads, as desired, then shot, and finally a wad, and for closing the outer end upon the last wad.

All the details of my invention and its object, purpose, and scope will fully appear in the following general description and claims.

My device is illustrated in the accompanying drawings, as follows:

Figure 1 is a front elevation. Fig. 2 is a rear elevation. Fig. 3 is a plan view with the hoppers I and J removed. Fig. 4 is a vertical section on the line *x x*, Fig. 1, of the ramming, charging, and wad-carrying device, but does not show the means by which they are operated. Fig. 5 is a sectional view of the crimping device.

The frame-work of my machine consists of a base, A, which may be of metal or wood. A clamping device, A′, is provided to attach it to a table, bench, or other support. At one end of the base is a hollow metal column, B, which is large at the bottom and small at the top. The form of this column or standard is not essential. At the top of this standard is a semicircular frame, F, which lies horizontally. Within the small part of the standard is journaled a vertical shaft, D, which is provided at its lower end with a beveled gear, D′.

A crank-shaft, C, is journaled transversely in the large part of the standard B, and is provided with a small beveled gear, C′, which meshes into the gear D′. The gear C′ is not, strictly speaking, on the shaft C, but is on a sleeve, *c′*, and is clutched, when desired, by a clutch device, *c*, on the crank-shaft. The purpose of this construction is to allow the shaft C to be revolved without revolving the gearing, which is desirable, as the crimping device *u* is also on said shaft C, and will by these means be operative without operating the other parts of the machine. The relative size of the gearings C′ D′ is essential, not, however, the precise relative size shown; but a sufficient difference in size should exist, so that several revolutions of the shaft C will be required to cause one revolution of the shaft D. The object of this is as follows: The devices for charging the shell are operated from the shaft D, and the device for crimping or closing the shell over the charge in the shell is operated from or on the shaft C. It is necessary to crimp a shell that the crimper shall revolve several times upon it, while but one movement of the charging devices is required to charge a shell; and as it is desirable that the work of crimping one shell be done at the same time another shell is being charged, it is necessary that the crimper be timed to revolve many times while the charging apparatus performs one operation; hence the desirability of gearing in the manner shown, or substantially so.

The vertical shaft D is provided at its upper end with a crank, D″, which is connected by a link, *d*, with a swinging frame, Q, which is pivoted at R on the frame F. On this swinging frame Q are attached the charging devices and the wad-carrying devices.

The charging devices consist of a powder and a shot magazine, I and J, respectively. These may be of any form desired; but they are shown to be in the form of a hopper. In the necks of these magazines are located the cut-offs or gates *i* and *j*, respectively, and the measuring-chambers I′ and J′, respectively. The capacity of these chambers is regulated by a lateral extension with a swinging wall, P. (See Figs. 2 and 4.) This swinging wall P, by means of a bolt, *p*, or any convenient catch device, can be adjusted at various degrees of extension, thus adding to or diminishing the capacity of the chamber. The parts just described set in sockets I″ and J″ on the ends of the swinging frame Q. These sockets have a slanting bot-

tom, as shown in Fig. 4, and an orifice, *f f*, for the charge to pass through into the shell. As the shaft D—that is, the vertical shaft—is revolved, the frame Q is vibrated by reason of the crank D″ and the link *d*. (A cam-movement may be used in place of this device.) The vibration of this frame causes the charging devices just described to approach and recede from a central point alternately. At this central point devices are placed for adjusting the shell to be filled, and for causing the charges to flow into the shell, and also a ramming device. The charge is prevented from passing through the orifice *f f* in the charging-chamber until it reaches the discharging-point by a fin or flange, *f*, raised on the frame F. At the discharging-point the fin or flange *f* is omitted, and hence the orifice *f f* is no longer closed, (see Figs. 3 and 4,) and the charge is free to escape from the charging-chamber.

The devices for adjusting the shell in position to be charged consist of a platform, 7, for the shell to rest on, a screw, 6, for adjusting this platform to the desired height, and a holder, G G′, for embracing the open end of the shell. (See Figs. 1, 3, and 4.) The shell when adjusted sets on the platform 7, and its open end is embraced by the part G G′. As shells are of various sizes, it is necessary that the holder G G′ may be changed. Therefore each machine will be provided with various sizes of holders, or, rather, with holders with various-sized openings. These parts are made changeable by slipping in and out of the dovetailed slide *g g* in the frame F. (See Fig. 1.) F′ is a bracket which rises from, but forms a part of, the frame F, and extends over the opening in which the holder G G′ is adjusted, and affords a support to the ramming device, which consists of the ramrod H, having a bearing-plate, H″, on its lower end, and an ordinary hand-plate on its upper end, a spring, *h*, and a guide-tube, H′.

The devices for supplying wads are as follows: L L′ are wad-magazines mounted on posts *l l′*, which are attached to the frame F. Below each wad-magazine is a sliding block, M. Each of these blocks has a lug, *m*, extending down through a slot in the frame F, to which is attached a spring, S. The office of the spring is to retain the blocks M under the wad-magazines, except when pushed out from under the same, which occurs in the manner following: O O are wad-carriers, which are attached to the swinging frame Q by the webs *o o*. These wad-carriers are open-flared rings, (see Figs. 3 and 4,) and receive and retain the wads until driven through them by the ramrod. The position of the wad-magazines is such that when one arm of the swinging frame Q is at the central point the other arm will hold the wad-carrier under the wad-magazine. Therefore, as the frame vibrates, the wad-carriers will alternately displace the blocks M M from below the wad-magazines, and occupy that position. When the blocks are thus displaced the wads are free to fall into the carriers, and when the frame Q moves in the other direction the wad-carrier moves from under the magazine, closely followed by the block M, so as to prevent the wads not contained in the carrier from dropping out of the magazine, and carries the wad therein to the central point over the shell. The wad-carriers O are made detachable, and the machine is furnished with various sizes, whereby the machine can be adapted for filling various-sized shells. By placing a thicker block on one side of the machine, and on the same side using a deeper wad-carrier, the machine may be made to supply two wads from that side, while it supplies only one from the other. This is often desirable, as it is sometimes necessary to put two wads over the powder, while only one is placed over the shot. The wad-carriers O are made detachable by setting loosely in a ring formed on the end of the web *o*. (See Figs. 3 and 4.)

The wad-magazines are movable vertically on the posts *l*, so as to adjust them at proper height. They are made of sheet metal, and have an open slit, *l″*, on one side, and can thereby be compressed or expanded to suit various-sized wads.

The shut-off which opens and closes the passage from the hoppers to the charging-chambers are slides, and are moved by a lever, K, pivoted on lugs *k* on the sockets I″ and J″. The upper end of this lever fits loosely in a hole in the slide, and the lower end slides on the frame F. At the point where it is desirable that the slide should be opened there is a slot, T, and a lug or stop, *t*, on the frame F, (see Fig. 3,) which engages the lower end of the lever K and holds it, which causes the upper end of the lever K to fly out and pull the slide open.

The crimping device is fully shown in Fig. 5. It is attached to the crank-shaft C, (see U, Figs. 1 and 2,) and is in the form of a chuck or cup. The shell is crimped by placing the end of it in the cup while it is revolved, the same as in ordinary crimpers. The novelty in my device consists in making it adjustable to accommodate shells of various caliber. It is constructed as follows: On the shaft C is a four-faced wedge, V. In the center of this wedge, entering it at its apex, is a screw, Y, which has near its head a flange, Y′. Between this flange and the head of the screw is a block, Z, with radial spokes *z*. The cup proper is formed of segments W W W W, three of which are seen in Fig. 5, two of which are in section. There may be only two of these segments, or there may be three, four, or more. The form of the wedge V would be changed, however, as it must have as many sides as there are segments in the cup. The inner faces of these segments are formed at one end with an incline surface to conform to the wedge V, and at the other end they have such a form as will give the cup its proper cup-like form. Each segment has an opening through it for a spoke,

z, of the block Z, said spokes serving as guide-pins for the segments to move on radially. Each segment also has a groove, *w*, for the flange *y'* to fit in. An elastic annulus, *a a*, &c., holds the segments in place. This annulus may be of any material desired; but I prefer the use of rubber rings. The cup is adjusted to various sizes by turning the screw Y. If it is screwed in, the segments are advanced upon the wedge and expanded. If it is screwed out, the segments are withdrawn from the wedge and permitted to converge, the elastic annulus being the cause of their convergence. The shell, when being crimped, has to be held up at the other end and be pressed into the cup or crimper. The devices for doing this work are as follows: In a post, 1, at the proper distance from the crimper on the base A, is a sliding bar with a cup-shaped device, 2, on one end, and against the other end a lever, 3, presses, or rather may be pressed, which will push the sliding bar toward the crimper. The breech of the shell rests in the cup-shaped device 2, and as the lever 3 is pressed against the sliding bar, the mouth of the shell is pushed into the mouth of the crimper. The surface of the cup 2 on the inside, which comes in contact with the shell, is roughened, so as to prevent the shell revolving along with the crimper. In Fig. 3 another form is shown for the part 2, which may be employed, if desired. A spring, 4, reacts the sliding bar when the lever 3 is withdrawn from it. To cut off the shell or groove it when desired, the sliding bar is removed from the post, and the lever 3 is faced about, so as to bring the knife 5 toward the post, where it will cut off the shell, which is set over the post, as over a mandrel, and revolved by being turned by the hand. For grooving the shell a different-formed blade will be substituted for the knife 5, and the operation will then be the same as in cutting off the shell.

The following modifications in my device will be practical, if desired: The ammunition-magazines may be stationary and of any size desired, by connecting them with the charging-chambers by flexible tubes; or the magazine may be stationary, and in place of using the sliding cut-offs *i* and *j* a horizontal segmental apron may extend from the top of the charging-chamber, which would serve as a cut-off. In place of having the charging-chambers I' and J' made with one side movable, as described, the machine may be made with various-sized chambers, which may be adjusted in the machine as desired. In order that one wad-carrier shall carry two wads while the other carries one, it is not necessary that the blocks M be of varying thickness, as above mentioned, for the result may be secured wholly by the depth of the wad-carriers O.

The operation of my machine is as follows: The operator selects the proper-sized holder G G' and places it in the dovetailed slide in the frame F. He next adjusts the platform 7 at the proper height by the set-screw 6, and then puts the shell to be filled in position. He then adjusts the clutch *c* so that the pinion C' will revolve with the crank-shaft C. At this juncture we will suppose that the parts are in the position shown in Figs. 1 and 2, and that the magazine J contains powder and the magazine I contains shot. When in that position the cut-off slide *j* is drawn, and the charging-chamber J' is filled with powder, and the wad-carrier O, attached to that arm of the vibrating frame Q, is under the wad-magazine L', and we will suppose it is of such a depth as to receive two wads within its flaring walls. The operator then revolves the crank. The gearing C' and D' is such that it takes four revolutions of the crank-shaft C to make the upright shaft D revolve once, and one revolution of the shaft D effects a complete vibration (forward and back) of the vibrating frame Q; hence two revolutions of the crank will carry the magazine J, charging-chamber J', and wad-carrier O to the central point, and at the same time the other magazine and its attachments has been carried to the extreme of its lateral movement, when the filling operations take place. The magazine J having reached the central point, the powder flows through the break in the flange *f* and falls into the shell. The two wads in the wad-carrier are in position exactly above the mouth of the shell. The operator lets go of the crank with his right hand, and drives down the ramrod H with it. This effects the loading of powder. The operator then turns the crank two more revolutions, which carries the parts back to the initial point; but the charger I' has brought to the central point and discharged into the shell the charge of shot, and a wad is in the wad-carrier, ready to be driven into the shell, which the operator does. He then removes with his left hand the loaded shell, and supplies an empty one with his right hand. With his left hand he places the filled shell in the crimper and presses against it with the lever 3, and at the same time revolves the crank to both fill the empty shell and crimp the filled one. By the time the second shell is filled (which is all done, crank turning and ramming, with the right hand) the first shell is crimped and ready for use. It will thus be seen that the operation is continuous, and that filling and crimping is effected at the same time and by one mechanism.

I am aware that cartridge-loading machines have been heretofore in use in which the magazine was movable from and toward the conduit; but only one magazine was used, and that was moved by a hand-lever.

I am also aware that charging-machines have been made with two magazines fixed stationary on each side of the conduit leading to the shell, and having charging devices movable therefrom toward the conduit; but these were operated by a hand-lever, were not moved from a common pivot-post by being both at-

tached to one vibrating lever, as mine are, and therefore they did not necessarily move together, one toward and the other from the conduit.

I am also aware that the charging-chambers of such machines have been made with a movable wall to enlarge or contract the said chamber. I do not therefore claim such means for enlarging or contracting the chamber, but only claim the construction I show.

I am also aware that in machines for charging metallic shells with powder and bullet the work of charging and crimping has been performed in one operation of the machine; but the mechanism for so doing is different from mine, and the operation of crimping is very different.

What I claim as new is—

1. In a cartridge-loading machine, the combination, with the conduit leading to the shell, of two magazines having means attached thereto for measuring the charges, and which are attached to a vibrating bar or lever, whereby, as the said bar or lever is vibrated, the said magazines are alternately brought to and receded from the said funnel or conduit, substantially as and for the purposes mentioned.

2. In a cartridge-loading machine, the combination, with the ramming device, of two wad-magazines placed at opposite sides of said ramming device and two wad-carrying devices attached to opposite sides of a centrally-pivoted vibrating frame, which, as it vibrates within a prescribed arc, as shown, alternately brings one of said wad-carriers in conjunction with one of said wad-magazines and the other wad-carrier under the said ramming device, substantially as shown.

3. In a cartridge-loading machine, the combination, with the conduit leading to the shell and the ramming device, of two charging-chambers having means, substantially as shown, for discharging their contents into said conduit, and two wad-carrying devices, attached, in the relation substantially as shown, to a vibrating frame, which, as it vibrates, alternately brings one of said charging-chambers and one of said wad-carriers to and recedes them from the said conduit and ramming device, substantially as shown.

4. In a cartridge-loading machine, the combination, substantially as shown, of a charging-chamber and a wad-carrying device, attached together and adapted, substantially as shown, to be simultaneously moved from a point at one side of the ramming device and the conduit leading to the shell to juxtaposition with the same.

5. In a cartridge-loading machine, the combination, substantially as shown, of two wad-magazines placed at opposite sides of the ramming device, and two wad-carriers, attached, respectively, to opposite sides of a centrally-pivoted frame, and thereby adapted to vibrate from the wad-magazine to the ramming device.

6. In a cartridge-loading machine, the combination, with the ramming device, of a wad-carrying device consisting of a flared ring or opening, adapted, substantially as described, to receive a wad from the wad-magazine, carry it to a position below the ramming device, and retain it until it is removed therefrom by the said ramming device.

7. In a cartridge-loading machine, the combination, substantially as shown, of the crank-shaft C, gearings C′ and D′, upright shaft D, vibrating frame Q, operated from said shaft D, charging devices I and J, wad-carriers O O, wad-magazines L L′, and ramming devices H.

8. In a cartridge-loading machine, the combination, substantially as described, of the following elements: a laterally-moving charging-chamber having a mouth formed by an opening on its side at or near the bottom, and a fin or flange, *f*, raised along the line of the traverse of the said charging-chamber on the frame F, for closing said opening until the chamber reaches the point where the cartridge is located for filling.

9. In a cartridge-loading machine, a charging-chamber having a lateral extension on one side thereof and a swinging or pivoted wall, P, within the same, whereby the capacity of said chamber may be varied, substantially as set forth.

10. In a cartridge-loading machine, a crimping chuck or cup, formed of segmental parts elastically connected together, and an expanding wedge or cam, and means, substantially as shown, for operating the said wedge or cam, whereby it is adapted to receive shells of various sizes.

11. The expansible crimping chuck or cup formed of segments with holes, in which are raidial guide-pins, an elastic annulus for keeping said segments together, and an expanding wedge and screw for expanding said segments, substantially as shown.

12. In a cartridge-loading machine, the combination, substantially as shown, of the crank-shaft C, having thereon a crimping chuck or cup, an upright shaft, D, having mechanism for charging the shells operated therefrom, and gearing C′ and D′, for operating said shaft D from said shaft C.

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

WILLIAM H. WHITEHEAD.

Witnesses:

JNO. K. HALLOCK,

SAM. WOODS.