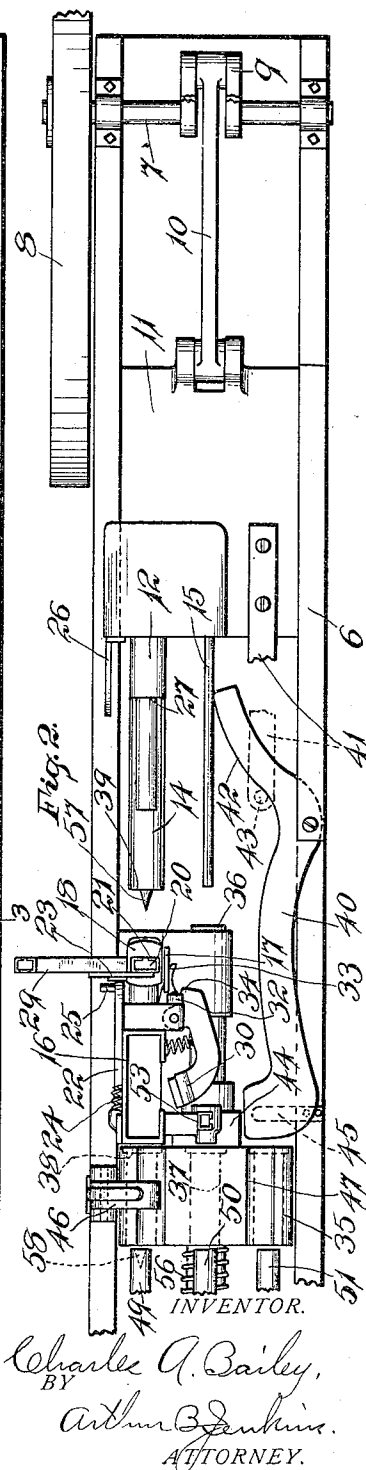
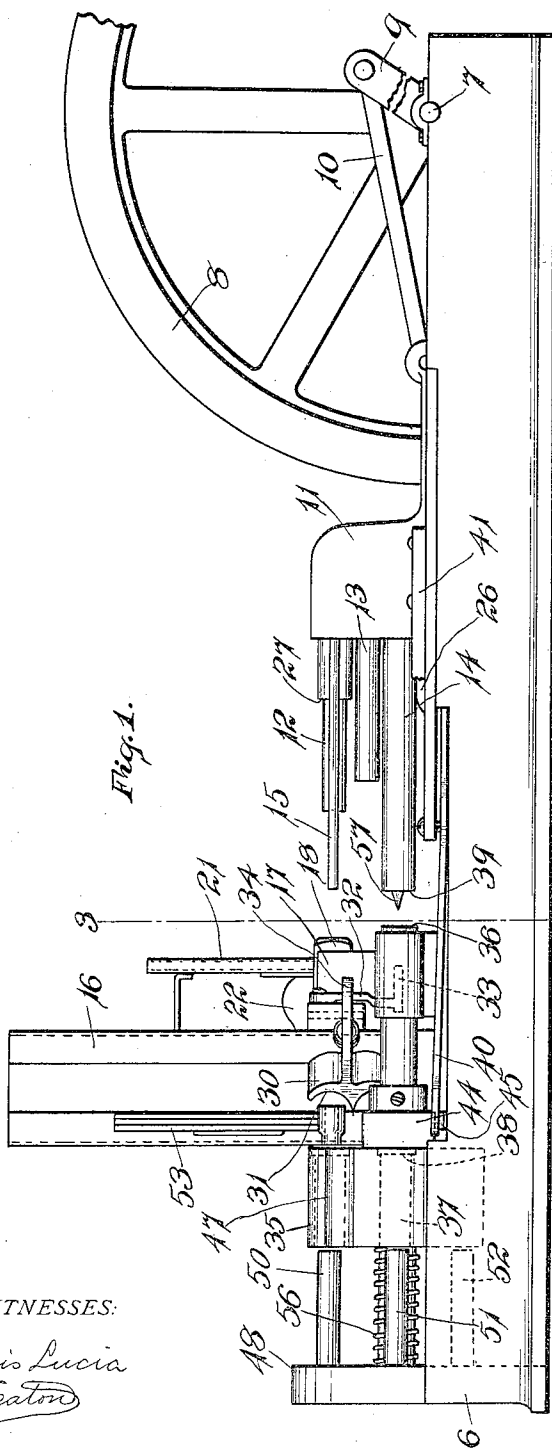


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APPLICATION FILED JULY 11, 1911.

1,065,333.

Patented June 24, 1913.

2 SHEETS-SHEET 1.



WITNESSES:
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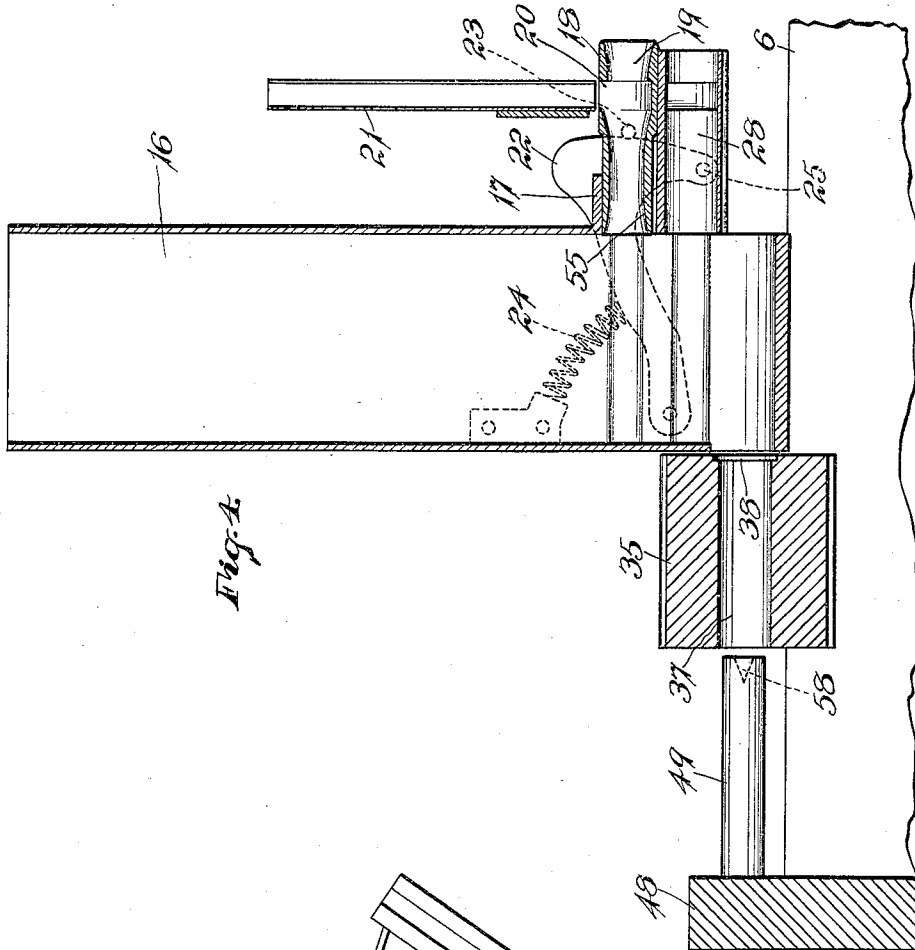


Fig. 2.

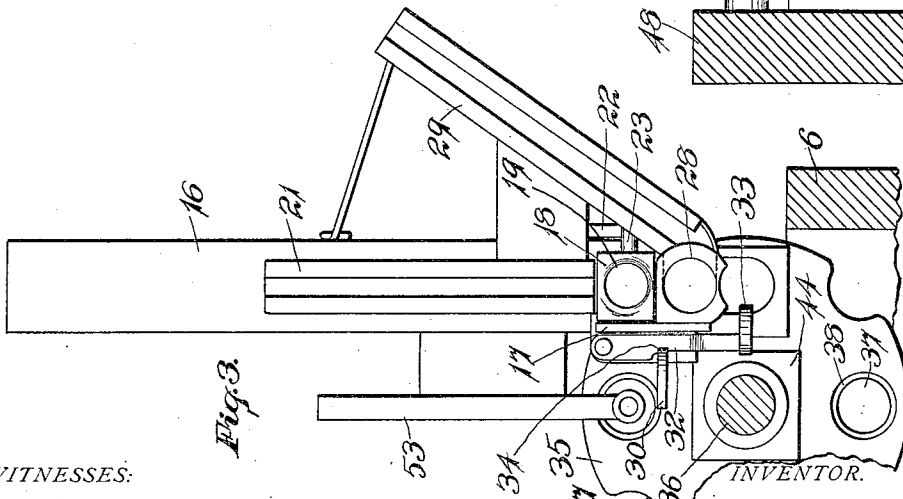


Fig. 3.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR MAKING CARTRIDGE-SHELLS.

1,065,333.

Specification of Letters Patent.

Patented June 24, 1913.

Application filed July 11, 1911. Serial No. 638,000.

To all whom it may concern:

Be it known that I, CHARLES A. BAILEY, a citizen of the United States, and a resident of Cromwell, in the county of Middlesex and State of Connecticut, have invented a new and Improved Machine for Making Cartridge-Shells, of which the following is a specification.

My invention relates to the class of machines for making shells usually formed of paper to constitute a cartridge, and especially those made for use in shot guns and similar firearms, and the general objects of my invention are to provide a machine of this class simple in construction, containing a minimum number of parts, and one particularly efficient in its operation and in the character of work produced.

Other objects will appear from the following description and accompanying illustrations in which—

Figure 1 is a view in side elevation of a machine embodying my invention, the feed lever actuating bar being broken off, and the fly-wheel being broken away. Fig. 2 is a plan view of the same, the feed lever actuating bar being broken off but shown in dotted lines in position when the cross-head is at the forward limit of its play. The feed lever in this view is also shown in the position occupied by it when the cross head is at the forward limit of its play, the other parts being shown in this view in their natural positions with the cross-head at its rearward limit of movement. Fig. 3 is a detail view in section through the device on plane denoted by dotted line 3—3 of Fig. 1. Fig. 4 is a detail view in vertical section through a part of the machine on plane passing centrally through the tube feed chute and lengthwise of the bed.

The machine herein illustrated and described and embodying in one form a structure containing my invention is intended to operate upon paper tubes, cut to the required length to form a cartridge, performing such operations and adding such devices thereto as will prepare the shell to receive its explosive charge.

In the accompanying drawings the numeral 6 denotes the bed of the machine, constructed of any suitable material and in any desired form and upon which is mounted a driving shaft 7 operated from any suitable source of power and having a fly-wheel 8

and connected as by means of a crank 9 and pitman 10 with a cross-head 11. These parts may be of any well-known construction and further and detailed description is therefore omitted herein. This cross-head carries, projecting therefrom, a base-wad-inserting-plunger 12, a cap-placing-plunger 13, a heading-plunger 14 and a primer-inserting-plunger 15, constructed and operating as more specifically hereinafter described.

A tube feed chute 16 rises from the bed 6, which chute is of a width substantially equal to the length of a cartridge shell and of a thickness substantially equal to the diameter of the tubes which lie in a horizontal position in and are fed by gravity down the chute. The chute may be supplied from any suitable source as a "fountain feed" or the like. A box 17 extends from one edge of the chute and is supported thereby, this box being so located that the openings to be hereinafter described will be in position to receive the plungers from the cross-head.

A reducing plug and base-wad-receiver 18 is mounted for reciprocating movement in the box 17, this receiver having a longitudinal opening 19 and a lateral opening 20, the latter to receive a base-wad from the base-wad-feed-tube 21 supported to properly feed the base wads to this receiver.

A locking lever 22 is pivotally mounted on the chute 16 in position to engage a locking pin 23 on the wad receiver 18 and hold the latter against movement when the parts are in this position, a spring 24 being employed if desired to hold the lever in position. A releasing lug 25 is supported on this lever in the path of movement of a releasing cam 26 secured to and carried by the cross-head 11, this cam being so positioned that as the cross-head is moved inward the releasing lug 25 is engaged and the lever raised to permit movement of the wad receiver and reducing plug 18, this movement taking place during the latter part of the inward movement of the cross-head, and being caused by engagement with a shoulder 27 on the base-wad-inserting plunger 12.

The box 17 has a longitudinal opening located directly under the wad receiver and constituting a cap holder which is supplied with caps through a cap feed tube 29 secured in position to deliver the caps through an opening in the side of the holder, in the form

shown this tube being supported at its lower end by the box 17. The opening or cap holder 28 is located in line with the cap-placing-plunger 13.

5 The bottom of the tube feed chute 16 forms a rest for the pile of tubes supported in the chute, the bottom tube being in position to be operated upon by the heading plunger 14. A tube holder 30 having tube
10 receiving recesses 31 is pivotally mounted in position to engage the paper tubes and hold them in line with the openings 19 and 28 while the plungers appurtenant to these
15 opening are operating, these recesses being beveled as shown, so that if a tube or tubes should be slightly out of registering position with an opening or openings it or they will be forced up into the proper registering position. This holder is operated by the
20 movement of the heading plunger 14 in the form of mechanism herein shown, a lever 32 pivotally mounted upon a stationary part of the device being located with a projection 33 in the path of movement of the end of
25 the heading plunger, this lever in its swinging movement engaging a tail 34 on the tube holder.

A carrier cylinder 35 is mounted on the base, being supported on a shaft 36, mounted
30 in suitable bearings on the base. This cylinder has dies 37 to receive the tubes from the rest at the bottom of the chute 16, which tubes are pushed into the dies in the cylinder by the action of the heading plunger 14. Each of these dies has a heading shoulder 38
35 against which the caps are headed by the action of the end 39 of the heading plunger 14. This cylinder has a sliding movement on the shaft 36, a spring 56 forcing the cylinder in one direction. The cylinder may
40 be given a step by step rotation at each reciprocating movement of the cross-head 11, in the construction herein shown a feed lever 40 pivotally mounted on the base being actuated
45 by a feed-lever-actuating-bar 41 secured to said cross-head, a cam projection 42 on the lever being engaged by a pin 43 on the bar. The end of the feed lever engages a ratchet 44 secured to the carrier cylinder, in the form shown this ratchet being
50 square, and the four corners serving as the teeth against which the feed lever 40 strikes in its reciprocating movement. A spring 45 is located under the feed lever 40 which is so loosely mounted on its pivot that it may
55 be slightly raised by the action of the spring in order to cause the lever to engage each succeeding tooth or corner on the ratchet and thus rotate the cylinder.

60 A holding arm 46 is spring pressed toward the cylinder, its end being in position to engage holding recesses 47 in the edge of the cylinder, a recess being provided appurtenant to each of the openings in the cylinder
65 and the pressure of the arm being such that

a force to rotate the cylinder will release it from engagement with this recess.

A stationary head 48 is mounted on the base and contains a heading anvil 49, a priming anvil 50, a starting plunger 51, and an
70 ejecting plunger 52.

A primer chute 53 is suitably located to receive primers, which at the proper moment are pushed into an opening previously
75 formed in the center of the cap, these primers being so inserted in the opening by the plunger 15 secured to the cross-head 11.

In the operation of the device, assuming a pile of tubes to be located in the chute 16, and the bottom tube and the next to the bottom tube having received its initial operation, a certain tube is acted upon as follows; this description applying to the third tube from the bottom of the chute:—As the cross-head moves forward the base-wad-inserting-
80 plunger passes into the opening 19 engaging a wad and carrying it along said opening which is smaller in size than the opening in the paper tube, so that the wad is reduced and easily enters said opening, the base wad
85 receiver at this time being held against movement by the locking lever 22. As the cross-head approaches the end of this initial movement the releasing cam 26 on said head engages the lug 25 raising the lever 22 from
90 engagement with the locking pin 23, at which moment the shoulder 27 on the plunger 12 engages the end of the reducing plug moving it inward when its beveled mouth
95 55 engages the end of the paper tube reducing it slightly so that the cap may be easily placed in position. In this reciprocating movement of the cross-head it will be understood that certain operations are being performed on the two tubes underlying the one
100 to which the above description applies, the bottom tube being pushed from the bottom of the chute. In the initial movement of the cross-head the tube holder 30 has been operated to engage the tube referred to as
105 well as the one directly underneath, moving them into registering positions with their openings and tightly holding them while the operations are taking place. As the cross-head moves backward this tube holder is released and the pile of paper tubes move
110 downward, this being allowed by reason of the removal of the tube from the bottom of the chute as above described. The cross-head now again moving forward the cap-placing-plunger 13 enters the cap holder 28,
115 engages a cap and pushes it on to the end of the paper tube, and the cross-head moving backward the pile again moves down as above described. The cross-head now again
120 moving forward a centering or piercing pin 57 on the heading plunger 14 strikes the tube, moving it from the bottom of the pile into the registering opening or die in the carrier cylinder 35 until the end of the head-
125 133

ing plunger strikes the side of the cylinder outside of the recess forming the heading shoulder 38. The paper tube with the parts affixed thereto and the cylinder now move forward simultaneously until the wad strikes the heading anvil 49 which has a recess 58 to receive the centering and piercing pin 57 which now fully enters an opening which may have been previously formed in the cap and base wad in case it had not entered such opening before, or makes such opening in case it has not been so formed. The movement of the paper tube having thus been arrested by the anvil the plunger and cylinder continue to move forward until the wad strikes the end of the anvil, and the movement of the cross-head is so regulated that a slight movement of the plunger will occur after the parts have been so brought together, with a result that the base wad will give enough to allow this movement and the edges of the cap will be forced out into the recess between the end of the plunger and the heading shoulder in the cylinder, thus forming a lip or flange on the cap. The cross-head now moves back operating the feed lever 40 by the mechanism hereinabove described and moving the cylinder forward a one step movement, and bringing the flanged shell into position registering with the opening in the primer feed tube 53 and in line with the primer-inserting-plunger 15. As the cross-head now moves forward the primer-inserting-plunger pushes a primer into the opening which has been formed, and at the next step forward of the cylinder caused by the reciprocating movement of the cross-head, the starting plunger 51 enters the shell moving it slightly from its place, and at the next step movement forward of the cylinder the ejecting plunger 52 enters the shell and completely removes it, and at the next step forward the vacant recess is in position to receive another cartridge from the base of the tube feed chute.

It will be understood that the several plungers and anvils are of suitable length to properly perform the work required of them as hereinbefore described.

While I have shown a preferred form of mechanism for carrying my invention into effect, the construction herein illustrated and described may be departed from to a greater or lesser extent and yet embody the invention as defined by the claims herein, and I do not therefore limit myself to the detailed construction herein illustrated and described.

The die in the cylinder as shown herein is formed directly in the material of the cylinder, but the dies may be differently constructed and provided with recesses for the cartridge shells if desired.

I claim:—

1. A chute arranged to receive tubes and

having an opening in its wall located to register with the openings in successive tubes as they are fed along the chute, and means for operating through said opening to attach a member to a tube while located in said chute.

2. A chute arranged to receive tubes and having a plural number of openings each arranged to register with the openings in successive tubes as they are fed along the chute, and members movable through said openings to operate upon a tube as it comes into registering position with each of said openings and while located in said chute.

3. A chute arranged to receive tubes and having openings arranged to register with openings in successive tubes that are fed along the chute, a wad-inserting-plunger and a cap-placing-plunger operating through the openings upon tubes while located in the chute, means for supplying wads and caps to said members, and means for operating said members.

4. A chute arranged to receive tubes and having openings arranged to register with openings in successive tubes that are fed along the chute, a wad-inserting-plunger and a cap-placing-plunger located to operate through said openings upon tubes while located in said chute, means for supplying wads and means for supplying caps to said members, means for operating said plungers, and means for removing the tubes from said chute.

5. A chute arranged to receive a pile of tubes horizontally disposed therein, and said chute having openings each arranged to register with an opening in a tube in said pile, a wad-inserting-plunger, a cap-placing-plunger, and a heading-plunger simultaneously operating each through an opening in the chute upon a tube therein, the heading plunger removing the bottom tube from the pile, and means for operating the plungers.

6. Means for supporting a tube, a wad-receiver movably mounted with respect to said supporting means and provided with means to reduce a tube, and means for inserting a wad into a tube from said receiver and for moving the receiver to reduce the end of the tube.

7. Means for supporting a tube, a wad receiver and reducing plug movably mounted with respect to said supporting means, means for supplying wads to said receiver, a wad-inserting-plunger positioned to operate through said plug to place a wad in the tube and arranged to operate said plug to reduce the end of the tube, and means for operating said plunger.

8. A chute arranged to receive a pile of tubes horizontally disposed therein and having openings located to register with openings through said tubes, a wad-receiver and reducing plug movably located in one of

- said openings, said plug having a central opening therethrough, means for supplying wads to said receiver, a wad-inserting plunger positioned to pass into the opening in the plug to remove a wad therefrom and arranged to move to reduce the end of the tube, means for operating said plunger, and means for removing the tubes from the chute.
9. A support for a tube, a wad-receiver and reducing plug movably mounted with respect to said support, said plug having an opening lengthwise therethrough with a flaring mouth, a wad-inserting-plunger mounted to reciprocate in line with the opening in the plug and having a shoulder to engage said plug to move it after the wad has been removed therefrom, means for locking the plug against movement, means for unlocking said locking means, and means for operating the plunger.
10. A holder for a tube, a wad-receiver and reducing-plug movably mounted with respect to said support, means for locking said plug against movement, a plunger adapted to insert a wad in said tube, and means for unlocking said plug and for moving it from the tube.
11. A support for a tube, a wad-receiver and reducing-plug movably mounted with respect to said support, a reciprocating slide, a lock to hold said plug against movement, a plunger secured to the slide in line with the opening in the plug and having a shoulder to engage the end of the plug to operatively move it, and a cam secured to said slide to release said lock just before the engagement of said shoulder with the reducing plug.
12. A chute arranged to receive tubes and having an opening through its wall, and means acting through said opening to perform an operation upon each tube as they are successively placed in position with respect to said opening and while they are located in said chute.
13. A chute arranged to receive tubes, a plural number of devices arranged to operate simultaneously through an opening in the wall of the chute and upon successive tubes as they are fed along the chute, said operations taking place while the tubes are located and held within the chute, and means for operating said devices.
14. A chute arranged to receive a number of tubes, said chute having a number of openings arranged to register with the openings in the tubes that are fed along said chute, means for simultaneously performing certain operations upon said tubes as they are successively located opposite said openings and while held in said chute, a cylinder located to receive the tubes from said chute, means for moving the tubes from the chute to said cylinder, means for operating upon the tubes in said cylinder, and means for imparting step by step movement to said cylinder.
15. A chute arranged to receive tubes and having openings disposed to register with openings in the tubes that are fed along the chute, a slide, means for operating the slide, a number of plungers secured to the slide and arranged to simultaneously operate upon the tubes while held in said chute, one of said plungers being arranged to remove a tube from the chute and insert it in a cylinder and operate upon it in said cylinder, the cylinder positioned to receive said tubes, and means for imparting a step by step movement to said cylinder.
16. A chute arranged to receive a number of tubes and having openings disposed to register with openings in the tubes that are fed along the chute, a cylinder rotatably mounted to receive tubes from said chute, a slide, a number of plungers mounted upon the slide to simultaneously operate upon a plural number of tubes in said chute and upon a plural number in said cylinder, one of said plungers being arranged to remove the tubes from the chute to the cylinder, means for operating the slide, and means for imparting step by step movement to said cylinder.
17. A chute arranged to receive tubes and having openings disposed in line with openings in the tubes that are fed along the chute, a cylinder having recesses to receive tubes from said chute, said cylinder being slidable longitudinally to receive said tubes and then to be moved away from the chute, said cylinder also being rotatably mounted, means for operating the cylinder, members for operating upon the tubes while located in said chute, and means for operating said members.
18. A chute arranged to receive tubes, a holder movably mounted with respect to said chute to engage tubes therein and hold them in position alining with openings in the side of the chute, means for operating upon said tubes through said openings while held in said chute, and means for operating said positioning means.
19. A chute arranged to receive tubes that are moved along said chute, a holder movably mounted and having recesses to engage a plural number of tubes in said chute and hold them in registering position with respect to openings formed in the wall of the chute, means for operating said positioning means, and means for operating through said openings upon the tubes while held in said chute.
20. A chute arranged to receive tubes and having a plural number of openings arranged to register with the openings in the tubes, a wad-receiver and reducing-plug located opposite one of said openings, means

for supplying wads thereto, a cap-receiver
located opposite another of said openings, a
slide, means for operating the slide, a wad-
inserting-plunger, a cap-placing-plunger,
5 and a heading-plunger secured to said slide,
the heading-plunger being arranged to re-
move tubes from the chute to a cylinder and
to form a head thereon, the cylinder to re-
ceive said tubes, a primer-receiver, a primer-
10 inserting-plunger mounted on said slide to
place a primer in the cartridge head in said
cylinder, and means for operating the cyl-
inder.

21. A chute arranged to receive tubes and
having a slot in its side wall, a holder mov- 15
ably mounted with respect to said slot and
having recesses to engage and position tubes
in said chute, said holder being positioned
to enter said slot, means for operating upon
said tubes, and means for operating said 20
holder.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
