No. 676,472. Patented June 18, 1901.

G. M. PETERS.

SAFETY APPLIANCE FOR CARTRIDGE LOADING MACHINES.

(Application filed Sept. 17, 1900.)

(No Model.) 2 Sheets—Sheet 1.

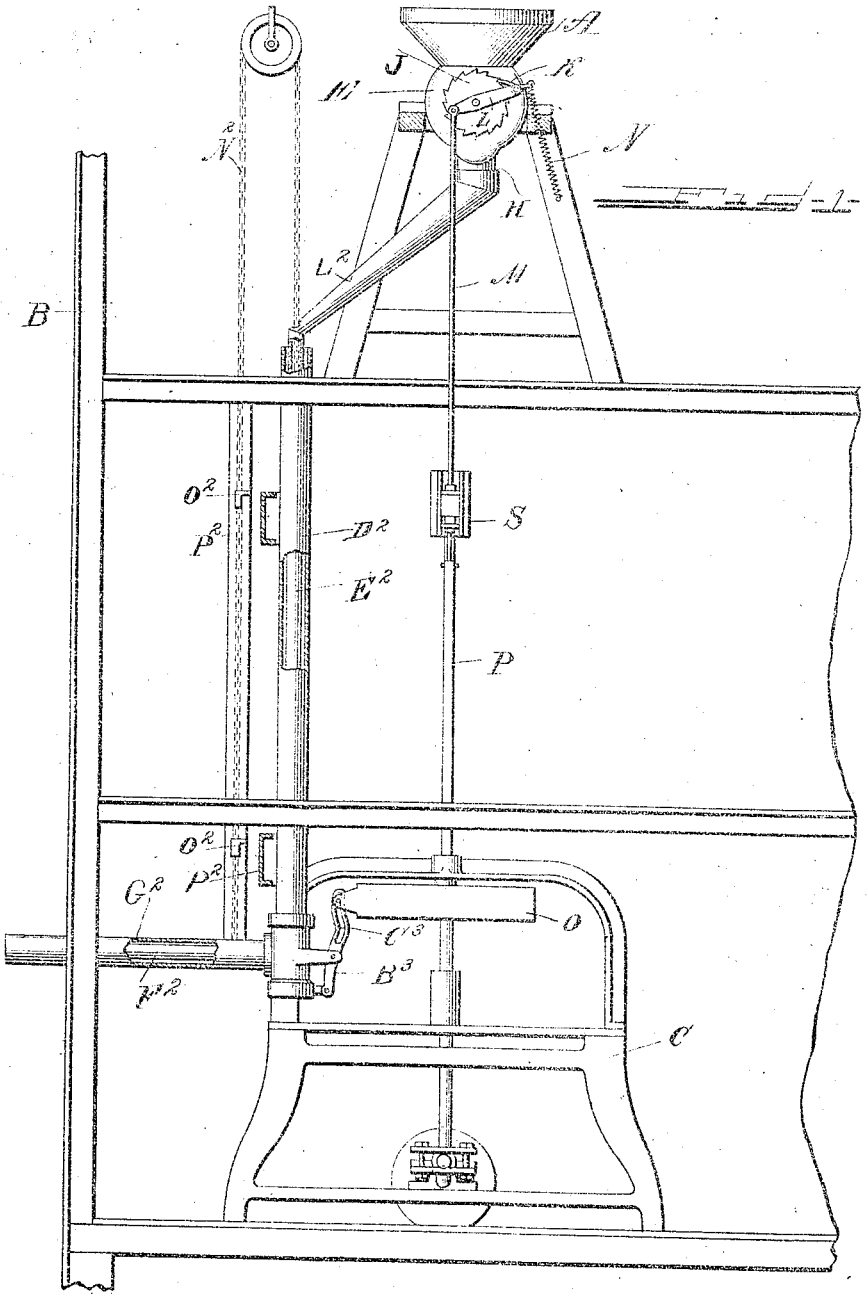

FIG. 1.

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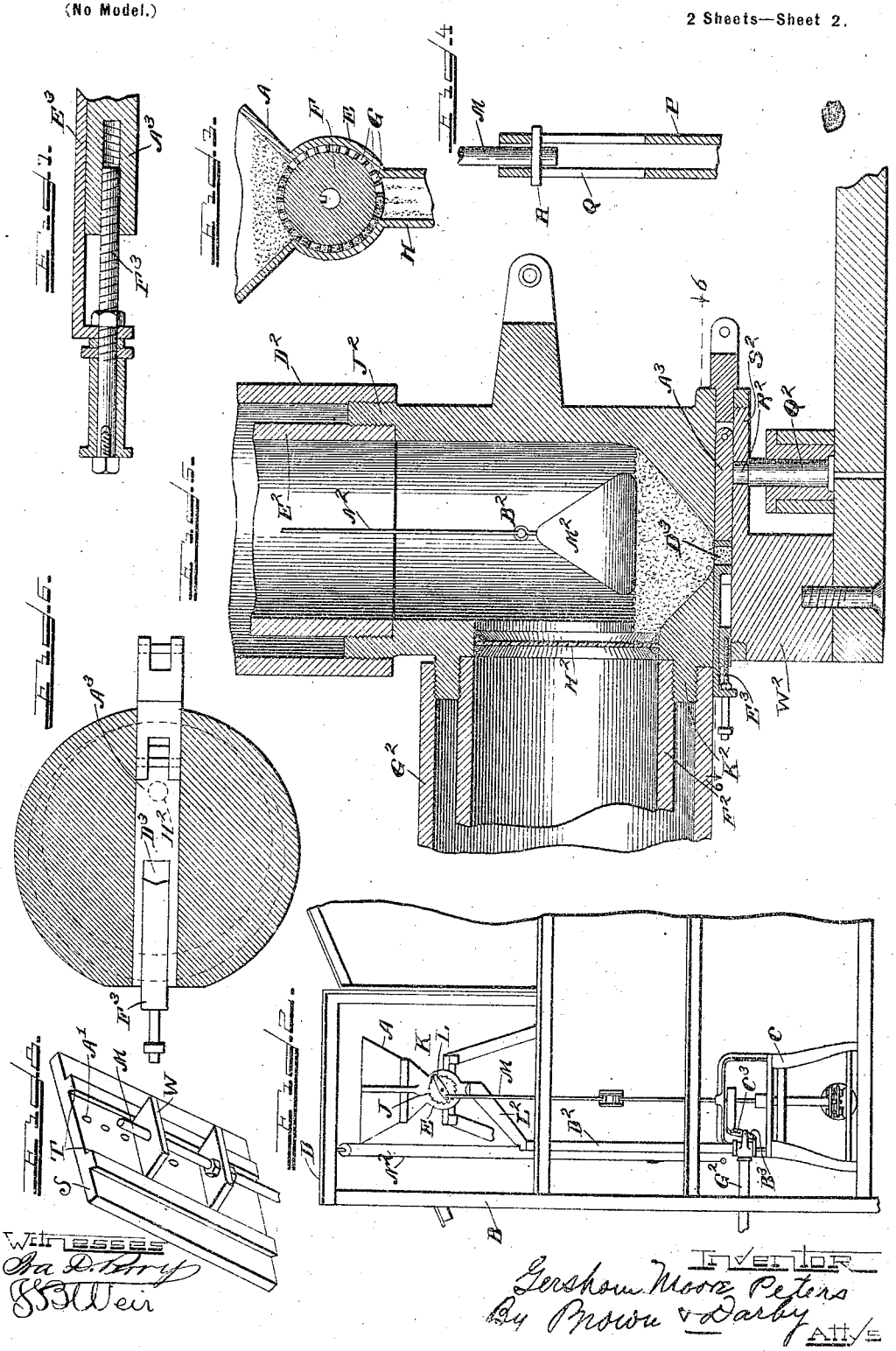

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UNITED STATES PATENT OFFICE.

GERSHOM MOORE PETERS, OF CINCINNATI, OHIO, ASSIGNOR TO THE PETERS CARTRIDGE COMPANY, OF SAME PLACE.

SAFETY APPLIANCE FOR CARTRIDGE-LOADING MACHINES.

SPECIFICATION forming part of Letters Patent No. 676,472, dated June 18, 1901.

Application filed September 17, 1900. Serial No. 30,222. (No model.)

To all whom it may concern:

Be it known that I, GERSHOM MOORE PETERS, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Safety Appliance for Cartridge-Loading Machines, of which the following is a specification.

This invention relates to safety appliances for cartridge-loading machines.

One object of the invention is to provide safety appliances for cartridge-loading machines which are simple in construction and effective in operation.

A further object of the invention is to provide an arrangement of apparatus wherein danger from accidental explosion in loading cartridges is reduced to a minimum.

A further object of the invention is to provide means whereby the bulk of powder employed for loading cartridges is removed from the place of greatest danger in the handling thereof during the loading operation.

Other objects of the invention will appear more fully hereinafter.

The invention consists, substantially, in the construction, combination, location, and arrangement of parts, all as will more fully hereinafter appear, as shown in the accompanying drawings, and finally pointed out in the appended claims.

Referring to the accompanying drawings and to the various views and reference-signs appearing thereon, Figure 1 is a view in side elevation, parts broken off and parts broken out, illustrating a construction and arrangement embodying the principles of my invention. Fig. 2 is a similar view on a reduced scale, illustrating the manner of housing the hopper in which is contained the bulk of powder employed. Fig. 3 is a broken detail view in section through the delivery end of the hopper containing the powder and showing the means for delivering therefrom the powder as required for use. Fig. 4 is a broken sectional detail view illustrating a portion of the means for actuating the powder-delivery drum or cylinder. Fig. 5 is an enlarged broken detail view in longitudinal section showing the construction and arrangement of chamber from which the separate charges of powder are delivered to the cartridges and also illustrating means for determining the quantity or amount of powder contained therein and the construction and attachment of the escape-pipes. Fig. 6 is a transverse sectional detail view on the line 6 6, Fig. 5, looking in the direction of the arrows and illustrating the adjustable powder-charge cut-off slide. Fig. 7 is a broken detail sectional view of the adjustable cut-off slide. Fig. 8 is a detached detail view in perspective of the link in the operating-rod by which the powder-delivery drum is actuated.

The same part is designated by the same reference-sign wherever it occurs throughout the several views.

In the operation of cartridge-loading machines it is a matter of material importance in the interest of safety to the workmen and building in which the loading-machine is located to remove the bulk of powder required for effecting the loading of cartridge-shells as far from the loading-machine as possible in order to avoid the danger and destruction resulting from accidental explosion.

It is the purpose of the present invention to provide a construction and arrangement wherein the bulk of powder is removed from the locality or immediate vicinity of the loading-machine and to provide means whereby the powder required for use for the charges of the cartridge-shells is supplied to the machine only in comparatively small quantities.

It is also my purpose to provide a construction and arrangement wherein in case explosion occurs, accidentally or otherwise, the concussion resulting therefrom will be taken care of and prevented from effecting damage or destruction to the surrounding machine or building and to prevent the flash from being communicated to the main bulk of the powder.

With these objects in view I arrange one or more suitable hoppers A to receive the main bulk of the powder to be supplied to the loading-machine. This hopper I prefer to arrange in a different part of the building B or room from that occupied by the loading-machine C. In the form shown I prefer to arrange the hopper upon or adjacent to the roof of the building, as indicated in Fig. 2, suitably inclosing the same in a casing or dormer-window

D to protect the same from the elements. At the delivery end of the hopper I form a chamber E, in which is suitably mounted a drum F, having a series of pockets or chambers G in the peripheral surface thereof, as clearly shown in Fig. 3, each pocket or recess adapted to receive a small amount of powder as said drum or cylinder is revolved. The chamber E terminates at its lower end in a tube H, and the drum F forms a partition between the delivery-tube H and the bottom of the hopper A, as clearly shown. The operation of this feature of the invention is as follows: The powder to be fed to the machine is delivered in bulk to the hopper A. Now by revolving the drum F the pockets in the peripheral surface thereof as they enter the hopper A during the revolution of said drum become filled with powder, which powder is carried by the rotating drum until such pockets reach the extension or tube H, whereupon the powder is deposited or delivered from the pockets or recesses in the drum into said tube or channel. Thus the drum F operates as a cut off for the hopper and effects the transfer of the powder from the hopper only in small quantities.

The powder-transfer drum may be actuated in any suitable or convenient manner and at a speed dependent upon that required for properly presenting or feeding the powder to the loading-machine. I have shown a simple and convenient arrangement for actuating the transfer-drum F, but to which my invention is not limited or restricted. In the form shown I provide the drum with a feed-rack in the form of a ratchet-disk J, with which engages a pawl K, carried by a lever L, suitably mounted, and to one end of which is connected an actuating-rod M. By suitably projecting the actuating-rod M the lever L is rocked, thereby causing the pawl K to engage the teeth of ratchet-disk J and effect a rotation thereof, and with it the transfer-drum F, a step-by-step feed or rotation being thus imparted to the transfer-drum. If desired, a spring N may be arranged to oppose the rocking movement of lever L. Of course many other specifically different arrangements of apparatus and devices may be devised for effecting the actuation of this powder-transfer drum and still fall within the spirit and scope of my invention. I do not desire, therefore, to be limited or restricted to the particular construction shown and described.

The actuating-rod M may be projected or actuated in any suitable or convenient manner. I have shown a simple and convenient arrangement, to which, however, the invention is not limited, wherein I connect said rod with the reciprocating head O or other convenient movable part of the loading-machine through a connecting-pitman P, whereby upon each reciprocation of the head O a rotative movement through a certain distance is imparted to the transfer-drum F. Reciprocation may be imparted to head O in any suitable manner, as by means of a crank connection with the main driving-shaft of the machine. In order that a certain degree of lost motion may be provided between rod M and connecting-pitman P, so that the full stroke of head O may not be imparted to rod M, I prefer to provide the end of pitman P with a transverse slot, as indicated at Q, Fig. 4, in which slides a cross-pin R in the end of rod M or link connecting said pitman with said actuating-rod. Thus the pitman P may travel through a portion of its stroke before the pin R reaches the limit of slot Q, and hence before the rod M begins to move. If desired and in order to still further regulate the distance through which the transfer-drum F is rotated upon each reciprocation of its actuating-rod and connecting-pitman, thus regulating the rapidity of supply or transfer of the powder from the hopper to the loading-machine, I may provide an adjusting connecting-link S, in which the proximate ends of said actuating-rod and pitman are suitably connected. In the form shown this link comprises a plate having dovetailed ways formed therein, as indicated at T, Fig. 8, in which ways slides a block W, to which the end of rod M is connected, and I provide a series of holes or sockets A' in said link, in any one of which may be inserted a pin or stud, so as to confine the block W therein. Thus by removing the pin or stud from one of said holes or sockets and placing the same in another the stroke of rod M may be regulated, thus regulating the arc through which lever L is rocked, and hence regulating the amount of rotation or rotative movement imparted to the transfer-drum.

From the delivery tube or opening H the powder is delivered into a chamber B^2 (see Fig. 5) in small quantities, as above explained, and from the chamber such powder is delivered in the form of a charge containing the required quantity for a cartridge, as will be more fully described hereinafter.

From the foregoing description it will be seen that the main body or bulk of the powder from which the supply is drawn is removed from proximity to the loading-machine, thus reducing danger of destructive explosion by accident or otherwise. It will also be seen that the powder is delivered to chamber B only in small quantities, so that in case of explosion only a small quantity of powder will be affected.

In order to still further protect the operators and apparatus, I provide the following construction: The chamber B^2 is formed in a casing C^2, with which casing are connected the tubes D^2 E^2 and the tubes F^2 G^2. The tubes E^2 F^2 are arranged within the tubes D^2 and G^2, respectively, the tube E^2 freely communicating with the chamber B^2 and the tube F^2 communicating with said chamber through an opening suitably closed by a fragile material—such, for instance, as glass—as indi-

cated at H^2, Fig. 5. The pipes F^2 and G^2 are arranged to extend through the wall B of the building to the outer air or to some other convenient place. The tubes E^2 and F^2 are of smaller exterior diameter than the interior diameter of their inclosing tubes D^2 G^2. A convenient arrangement is shown wherein the casing C^2 is provided with the cylindrical extensions J^2 K^2, threaded both interiorly and exteriorly, each end of tubes E^2 and F^2 being exteriorly threaded to be screwed into the interior threads of extensions J^2 K^2, respectively, while tubes D^2 and G^2 are interiorly threaded to be screwed onto the exterior threads of extensions J^2 K^2, respectively. By this construction it will be seen that the interior tubes E^2 F^2 are wholly inclosed within the tubes D^2 G^2, respectively. Therefore in case of an explosion occurring within chamber B^2 or within the tubes E^2 F^2 and which develops force sufficient to destroy the pipes E^2 F^2 the air contained within the space between said tubes and their inclosing tubes will form a cushion to prevent transmission of the concussion to the outer or inclosing tubes, the operation, in case of an explosion occurring within chamber B^2 being to shatter the fragile partition H^2 between said chamber B^2 and tube F^2, and the compressed gases resulting from the explosion, taking the path of least resistance, will follow the tube F^2 to the outer air, thus removing and reducing the danger of destruction resulting from the explosion, and the air-space between the inner tubes E^2 and F^2 and their inclosing tubes D^2 G^2 serving to prevent destruction of the outer tubes in case the explosion is of sufficient force to destroy the inner tubes.

The powder is supplied from the hopper in the manner above described to chamber B^2 through the tube E^2, which, as above explained, freely communicates therewith. The communication between the hopper and the upper end of tube E^2 is effected through a funnel I^2, which communicates at one end with the extension H and at the other end with the open end of tube E^2. The upper ends of tubes E^2 and D^2 are open, and therefore in case of explosion the gases resulting therefrom are not confined in a closed space, but are free to flow through the tube E^2 and out through the upper end thereof, even in the case where the fragile partition H^2 is not broken.

In order that any flash resulting from an explosion occurring within chamber B^2 or tube E^2 may not be communicated to the hopper, I prefer to arrange the hopper A out of alinement with tube E^2, as clearly shown in Figs. 1 and 2. Therefore, in addition to the protection against transmission of the flash afforded by the transfer-drum F acting as a cut-off for the hopper, by arranging said hopper out of alinement with the tube E^2 the flash will travel freely out of the free or upper end of said tube, thus avoiding danger of transmitting such flash to the powder in the hopper.

It may sometimes be desirable to provide means for indicating the quantity of powder contained in chamber B^2. I have shown a simple arrangement for accomplishing this result, wherein I arrange a block or plumb M^2 within chamber B^2 to be dropped as desired upon the mass of powder contained therein. A chain or cord N^2 connects to said block or plumb and, leading out through tube E^2 and over suitable guide-sheaves, carries one or more pointers or indexes O^2, arranged to operate in connection with stationary scales or indicators P^2. In this manner the quantity of powder contained in the chamber B^2 may be noted at any instant in the operation of the apparatus, thus warning the operator in case of an oversupply or an undersupply, and hence enabling the supply to the chamber to be adjustably regulated by adjusting the stroke of actuating-rod M in the manner above described.

When the plumb M^2 is not being used, it may be raised or drawn up off the powder and the chain N^2 fastened by a hook at the lower end, thus retaining the plumb elevated or suspended.

The powder may be delivered from chamber B^2 in suitable quantities to form charges for the cartridges in any suitable or convenient manner and by any suitable or convenient arrangement or construction of apparatus, which may be varied, altered, or changed according to the details of construction and arrangement of the particular type or form of cartridge-loading machine in connection with which the invention is employed. I have shown a convenient arrangement of simple construction wherein the cartridge-shell case Q^2 to receive the charge is suitably supported and presented in line with an opening or aperture R^2, formed in a flange or plate S^2 of a convenient portion of the supporting-frame W^2 of the machine. At or adjacent to the base of chamber B^2 is formed an aperture or opening across which is mounted to slide or reciprocate a powder-slide A^3, said slide being suitably mounted in guides formed in the supporting-frame plate S^2. A convenient arrangement of simple construction for effecting the reciprocation of the powder-slide A^3 is shown, wherein the end of said slide is pivotally connected to a lever B^3, provided with a cam-slot C^3, in which operates a projection from the reciprocating head O or other convenient movable part of the machine. By this construction and arrangement it will be seen that upon each complete reciprocation of head O the powder-slide is moved first into position for the pocket D^3 therein to communicate with the aperture or opening in the chamber B^2 to receive therein a quantity of powder sufficient to form a charge for a shell or cartridge and then into position for said pocket to register with opening R^2, thus depositing such charge into the open end of the shell-case presented in alinement with said opening or aperture R^2, and finally back again into position to receive

another charge from the chamber B^2. In order to adjustably regulate the amount of powder required for each charge, the area of the charge-pocket D^3 in the powder-slide may be varied by means of a plate E^3, connected to a threaded stud or bolt F^3, tapped into a threaded seat in the powder-slide A^3.

Upon the movement of the powder-slide into position for the charge of powder to be delivered through aperture R^2 into the shell-case placed to receive it the plate E^3 forms a cut-off for the powder remaining in chamber B^2.

As an additional element of safety a small hole G^3 may be drilled through the table or support upon which the shell-cases rest at points in line with the primer of the shell, thus avoiding danger of exploding the primer at those points where pressure is exerted by the loading devices and which might otherwise cause the primer to be exploded.

From the foregoing description it will be seen that I provide an exceedingly simple and efficient arrangement of safety appliances for reducing the danger resulting from explosions to a minimum and wherein the powder is efficiently delivered in charges of suitable size and quantity into the shell-cases.

Many variations in the details of construction and arrangement would readily occur to persons skilled in the art and still fall within the spirit and scope of my invention. I do not desire, therefore, to be limited or restricted to the exact construction and arrangement shown and described; but,

Having now set forth the object and nature of my invention and a construction and arrangement embodying the principles thereof and having explained the purpose, function, and mode of operation of such apparatus, what I claim as new and useful and of my own invention, and desire to secure by Letters Patent of the United States, is—

1. In a safety appliance for cartridge-loading machines, a chamber adapted to receive the powder, a transferring device adapted to receive from such chamber a sufficient quantity of powder to form a charge for a single shell, means for actuating said transferring device to deliver said charge to the cartridge-shells, a hopper removed from such chamber and adapted to receive the powder in quantity, and means for delivering the powder in small quantity from said hopper to said chamber, as and for the purpose set forth.

2. In an apparatus of the class described, a chamber adapted to receive the powder, means for transferring the powder in charges from said chamber to the cartridge-shells, in combination with a tube communicating with said chamber and extending outside of the building in which said chamber is located, and an inclosing tube for such first-mentioned tube, as and for the purpose set forth.

3. In an apparatus of the class described, a chamber adapted to receive the powder to be fed to a cartridge-loading machine, a safety-tube communicating with said chamber and extending to the outside of the building in which said chamber is located, a fragile partition arranged in the communication between said chamber and safety-tube, and an inclosing tube for said safety-tube, as and for the purpose set forth.

4. In an apparatus of the class described, a chamber adapted to receive the powder to be delivered to a cartridge-loading machine, a safety-tube communicating with said chamber, an inclosing tube for said safety-tube, said inclosing tube being of larger internal diameter than the external diameter of said safety-tube, thereby providing an air-space between said tubes, as and for the purpose set forth.

5. In an apparatus of the class described, a chamber, a hopper communicating with said chamber and adapted to receive the powder in bulk, a transfer-drum arranged in the base of said hopper, and having peripheral pockets or recesses, and means for rotatively actuating said drum, whereby the powder is delivered from said hopper to said chamber in small quantities, and a transferring device for delivering the powder from said chamber to the cartridge-loading machine, said transferring device adapted to receive a charge for a cartridge-shell, and means for actuating the same, as and for the purpose set forth.

6. In an apparatus of the class described, a chamber, an open-ended tube communicating therewith, a hopper arranged out of line with the open end of said tube and adapted to receive the powder in bulk, means for delivering the powder from said hopper into the open end of said tube in small quantities, a transferring device for transferring the powder in separate charges from said chamber to a cartridge-loading machine, and means for actuating said transferring device, as and for the purpose set forth.

7. In an apparatus of the class described, a chamber, a hopper communicating therewith and adapted to receive the powder in bulk, a drum provided with pockets or recesses in the peripheral surface thereof and arranged to form a cut-off for said hopper, means for rotatively actuating said drum, and means for adjustably regulating the extent of movement of said actuating means, in combination with a transferring device for delivering the powder in separate charges from said chamber to a cartridge-loading machine, and means for actuating said transferring device, as and for the purpose set forth.

8. In an apparatus of the class described, a chamber, a hopper communicating therewith and adapted to receive the powder in bulk, a drum having pockets in the peripheral surface thereof and forming a cut-off for the delivery end of said hopper, a ratchet-disk connected to said drum, a lever carrying a pawl arranged to engage the teeth of said ratchet-

disk for rotatively actuating the same, a rod connected to said lever, and means for reciprocating said rod, as and for the purpose set forth.

9. In an apparatus of the class described, a chamber, a hopper communicating therewith, a drum having peripheral pockets and arranged to form a cut-off for the delivery end of said hopper, a pawl-and-ratchet mechanism for rotatively actuating said drum, a reciprocating pitman having a slot in the end thereof, and a rod connecting said pitman and pawl-and-ratchet mechanism, said rod provided with a pin arranged to operate in the slot in said pitman, as and for the purpose set forth.

10. In an apparatus of the class described, a chamber, a hopper communicating therewith, a drum having pockets in the peripheral surface thereof and arranged to form a cut-off for the delivery end of said hopper, a pawl-and-ratchet mechanism for rotatively actuating said drum, a rod and pitman for actuating said pawl-and-ratchet mechanism, and an adjusting-link connecting said rod and pitman, whereby the extent of movement of said pawl-and-ratchet mechanism may be regulated, as and for the purpose set forth.

11. In an apparatus of the class described, a chamber, a hopper communicating therewith, a drum having pockets in the peripheral surface thereof and arranged to form a cut-off for the delivery end of said hopper, a pawl-and-ratchet mechanism for rotatively actuating said drum, a reciprocating head, a pitman actuated thereby, a rod for operating said pawl-and-ratchet mechanism, a link to which said pitman is connected, and means for adjustably connecting said rod to said link, whereby the stroke of said pitman and rod may be adjusted, as and for the purpose set forth.

12. In an apparatus of the class described, a chamber, an open-ended tube communicating with said chamber, means for delivering the powder in small quantities to said chamber, means for regulating the delivery of the powder, a plumb-block arranged within said chamber to rest upon the powder contained therein, a chain or cord connected to said plumb-block and extending through said tube, a pointer carried thereby, and a stationary gage coöperating with said pointer for indicating the quantity of powder contained in said chamber, as and for the purpose set forth.

13. In an apparatus of the class described, a chamber, a delivery-tube communicating therewith, a hopper arranged out of line with said tube, means for delivering the powder from said hopper to said tube and into the chamber, said chamber having an opening adjacent to the base thereof, a powder-slide arranged to move past said opening, and provided with a pocket adapted to receive the powder in sufficient quantity to form a charge for the cartridge-shell, and means for moving said slide, as and for the purpose set forth.

14. In an apparatus of the class described, a chamber, a delivery-tube communicating therewith, a hopper arranged out of line with said tube, means for delivering the powder from said hopper to said tube and into the chamber, said chamber provided with an opening adjacent to the base thereof, a frame-plate having an aperture therethrough in line with which the cartridge shell or case is to be placed, and a powder-slide having a recess therein adapted to receive a charge of powder from said chamber and deliver the same through said aperture into the shell or case, and means for reciprocating said slide to cause said recess or seat to alternately register with the opening in said chamber and the aperture in said base-plate, as and for the purpose set forth.

15. In an apparatus of the class described, a chamber, a delivery-tube communicating therewith, a hopper arranged out of line with said tube, means for delivering the powder from said hopper to said tube and into the chamber, said chamber having an opening adjacent to the base thereof, a powder-slide provided with a plate arranged to form a recess of sufficient size to contain a charge of powder, means for adjusting said plate whereby the size of said recess may be varied, and means for reciprocating said slide whereby said recess is brought into register with said opening to receive a charge of powder, and then into register with a cartridge-shell case to deposit the charge therein, as and for the purpose set forth.

16. In safety appliances for cartridge-loading machines, the combination of a hopper to receive the powder in quantity, a chamber removed from said hopper and adapted to receive the powder therefrom in small quantities, means for transferring the powder from said hopper to said chamber, and regulating the quantity thus transferred, means for delivering the powder in charges from said chamber to the cartridge-shell, means for regulating the charges so delivered, and safety-pipes communicating with said chamber and extending outside the building for relieving pressure in case of explosion, and conducting the fire or flash resulting from the explosion away from the powder-hopper.

17. In safety appliances for cartridge-loading machines, the combination of a hopper to receive the powder in quantity, a chamber removed from said hopper and adapted to receive the powder therefrom in less quantities, means for transferring the powder from said hopper to said chamber, and regulating the amount so transferred, means for delivering the powder from said chamber to the shells, means for regulating the amount so delivered, safety-pipes communicating with said chamber and extending outside the building, for relieving pressure in case of explosion, and conducting the flash or fire resulting from

the explosion away from the powder-hopper, fragile means for closing the safety-pipes, and a table or support for the shells, provided with a small opening to relieve the pressure exerted on the shell-primer by the loading devices, all as and for the purpose substantially as described.

In witness whereof I have hereunto set my hand, this 8th day of September, A. D. 1900, in the presence of the subscribing witnesses.

GERSHOM MOORE PETERS.

Witnesses:
A. M. BEEKLEY,
L. R. MYERS.