# T. J. Powers.

## Cartridge Loader.

No. 57258. Patented Aug. 14. 1866

Fig. 4

Fig. 3

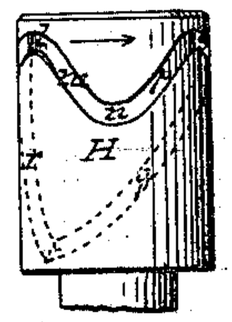


Fig. 1



Fig. 2

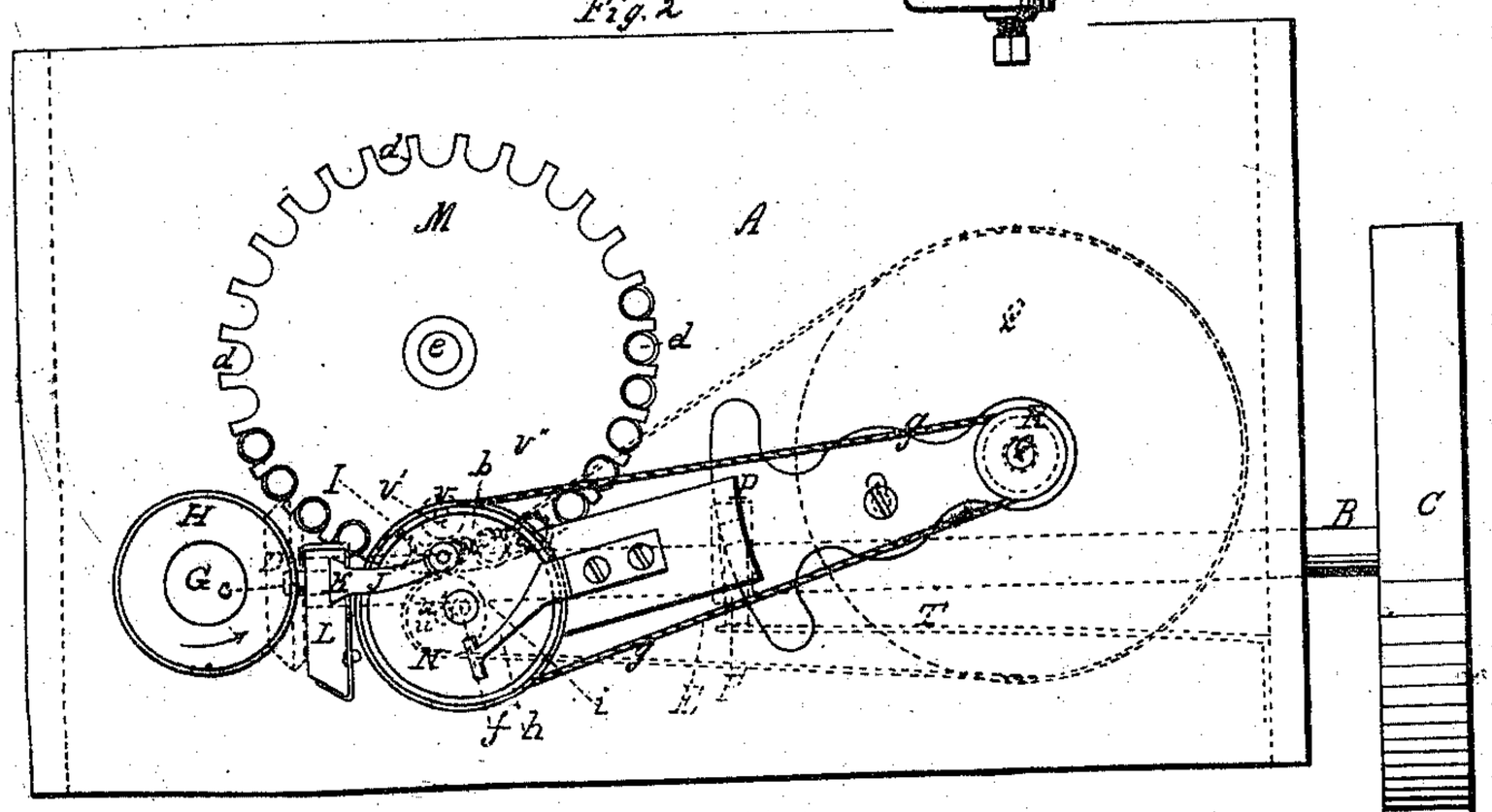
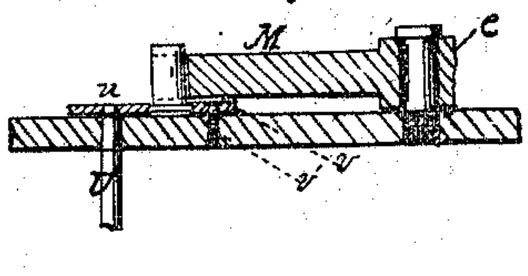


Fig. 5



Witnesses

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TIMOTHY J. POWERS, OF NEW YORK, N. Y., ASSIGNOR TO J. P. FITCH AND J. R. VAN VECHTEN, OF SAME PLACE.

## IMPROVEMENT IN MACHINES FOR PRIMING METALLIC CARTRIDGES.

Specification forming part of Letters Patent No. 57,258, dated August 14, 1866; antedated July 31, 1866.

*To all whom it may concern:*

Be it known that I, TIMOTHY J. POWERS, of the city, county, and State of New York, have invented a new and Improved Machine for Depositing Priming in Cartridge-Shells; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of the machine. Fig. 2 is a top view of the same. Fig. 3 is a side view of the cam which operates the feeder which deposits the priming in the cartridge-shell. Fig. 4 is a perspective view of the feeder on a larger scale than Figs. 1, 2, and 3.

Similar letters of reference indicate corresponding parts in the several figures.

Of the several contrivances in use for depositing the fulminate priming in the shells of cartridges not one fulfills the requirements of safety and exact or approximate measure and deposit of quantity.

The principal object of this invention is to remedy these defects; and to this end a part of this invention consists in a feeder which descends into a box, vessel, or reservoir containing the priming in a fluid or semi-fluid state, picks up the requisite quantity, and again descends to deposit the same in the cartridge-shell.

Another part of the invention consists in discharging the priming from the feeder by suddenly arresting the feeder in its rapid descent into or over the cartridge-shell.

A third feature of the invention consists in a certain combination, arrangement, and mode of operating the feeder, the priming-reservoir, and a carrier or contrivance for presenting the cartridges, one after the other, to the feeder.

Another part of the invention relates to the distribution of the fulminate priming around the head of the cartridge by centrifugal force produced by the spinning or rotary motion of the shell, and consists in commencing such spinning or rotary motion before the deposit of the priming in the shell.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is a table or framing which supports the working parts of the machine. B is the main shaft of the machine, arranged horizontally in suitable bearings in the framing, and carrying at one end the driving-pulley C, at the other end a bevel-gear, D, and near the middle of its length a perimetrical cam, E. The bevel-gear D gears with a bevel-gear, F, on an upright shaft, G, arranged in suitable bearings near one end of the framing and carrying, above the table, a cylindrical grooved cam, H, by the continuous rotary motion of which, obtained through the bevel-gear from the shaft B, the operation of the cartridge-feeder I is produced.

The cartridge-feeder I, Figs. 1, 2, and 4, consists of a rod having attached to its lower end a small hollow cylinder, which is open at the bottom, and has openings *a a* in the upper parts of its sides. The capacity of the portion of the said cylinder below the openings *a* is just sufficient to contain the required quantity of the fulminate-priming compound, which is used in a semi-fluid condition. By dipping the said cylinder into the compound in an upright position it is caused to receive the compound within it, the air escaping through the openings *a a*, and when it is lifted up slowly from the compound any excess beyond what is necessary to fill the part below the openings *a a* overflows through the said openings and runs off; but by giving it a rapid downward motion and suddenly arresting it the compound is caused to drop out. This discharge is aided by the pressure of the atmosphere entering through the openings *a a*.

After experiments with many forms of feeder, this is the one which I have found to operate with the greatest certainty of taking up a measured quantity of the fulminate compound and discharging the whole of such quantity into the cartridge-shell.

Another advantage of this feeder is that it operates without friction, and so removes all danger of explosion by the operation of the feeder in case of the drying of any of the fulminate compound upon it or any other part of the apparatus.

The feeder I is secured in an upright position by a set-screw, *b*, or other means, which permits its vertical adjustment in a socket at

the end of an arm, J, which is secured to a slide, K, which is fitted to work up and down in suitable guides in an upright standard, L, which is firmly secured on the top of the table A. The slide K has secured to it a stud, *c*, which is received in the groove of the cam H, and upon which the said cam acts to produce the operation of the slide and attached feeder by which the feeder is made to take the fulminate compound from a reservoir, N, and deposit it into the cartridge-shells, which are arranged in upright positions in a rotary carrier, M. This operation of the slide and feeder is assisted by a spring, S, connected with the slide by a rod, S′.

The carrier M consists of a horizontal circular wheel or disk having in its periphery a sesies of recesses or cavities, *d d*, of suitable sizes and forms and at equal distances apart to receive the cartridge-shells (shown in red outline in Fig. 1) in upright positions and with their mouths upward. The carrier thus constructed is arranged to rotate upon a fixed pivot, *e*, secured in the top of the table A in such position that the intermittent rotary motion of the carrier may bring the cartridge-shells, one after another, with their centers directly under the center of the feeder. The intermittent rotary motion of the carrier may be produced by any suitable means actuated by a cam on the main shaft B; but these means I have not thought it necessary to show.

The reservoir N, containing the fulminate priming, consists of a circular pan which is fitted to rotate concentrically upon a pivot, *f*, secured in an arm, P, which vibrates horizontally above the table A upon an upright shaft, Q, to which it is fitted loosely enough to allow of its easy vibration. This shaft Q has rotary motion imparted to it by a belt or gearing (not shown) from the main shaft B, and it is furnished at its upper end with a pulley, R, which transmits rotary motion to the pan N through an endless band, *g*, running in a groove in the periphery of the reservoir. This rotary motion of the reservoir is for the purpose of keeping the fulminate priming stirred by means of a stirrer, *h*, secured rigidly to the arm P. The central socket, *i*, of the reservoir, which fits the pivot *f*, is closed at the top, as shown in Fig. 1, to prevent the accidental entrance from the pan of any of the fulminate priming which might explode by friction. The horizontal vibrating motion of the arm P, by which the reservoir is brought under the feeder I to enable the latter to take up the charges of priming, and afterward moved out of the way to enable the feeder to descend into the cartridge-shells as they are presented under it one after the other, is produced in one direction by the action of the cam E, before mentioned, upon a rigid downwardly-projecting portion, P′, of the arm P, and in the other direction by means of a spring, T, which is attached to the framing of the machine and which keeps the said portion P′ of the arm in contact with the cam.

The form of the groove in the cam H, by which the necessary movement of the slide K and attached feeder is produced, is represented in Figs. 1 and 3, but more distinctly in Fig. 3, in which the form on one half of the periphery of the cam is shown in bold outline, and on the other half in dotted outline. The said groove, commencing at *l*, near the top of the cam, descends obliquely, as shown at *m*, Fig. 3, nearly half-way down the cam; thence runs for a short distance horizontally, as shown at *n* in the same figure; thence rises obliquely, as shown at *p*, Figs. 1 and 3, to the point *s*, near the top of the cam; thence again descends obliquely, as shown at *q*, Figs. 1 and 3, nearly to the bottom of the cam, as shown at *t*, and thence runs upward at a slight inclination, as shown at *r*, to the point *l*, first mentioned, thus making the complete circuit of the cam.

When, in the operation of the machine, the stud *c* of the feeder-slide K is at the point *s*′ of the groove of the cam H, and the slide K is raised high enough to bring the bottom of the feeder to a position above the upper edge of the reservoir, the reservoir remains stationary while the revolution of the cam permits the spring S to draw down the slide and dip the feeder into the priming, as shown in Figs. 1 and 2, and until by the farther revolution of the cam, the portion *m* of the groove has raised the slide high enough to permit the reservoir to pass out of the way of the feeder, which has now taken up a charge of priming. The spring T moves the reservoir aside out of the way of the feeder by the time the part *l* of the groove of the cam H has arrived opposite to the stud *c*, and the feeder is raised to its highest position, and as the revolution of the latter cam continues with the stud *c*, in the slightly inclined portion *r* of its groove, the spring S pulls down the slide K and feeder very rapidly, bringing the stud *c* to the bottom *t* of the groove with a smart concussion, by which the feeder is suddenly arrested in its descent and its charge of priming is, by its own momentum discharged into the cartridge-shell below it.

In the continued rotary motion of the cam H the portion *r* of its groove, by its action on the stud *c*, raises the slide K and the feeder, bringing the said stud to the point *s* in the groove, preparatory to a repetition of the above-described operation of the feeder and reservoir. While the slide and feeder are being raised the reservoir is moved by the cam E to the position under the feeder as at first described and represented in Figs. 1 and 2, and before the stud *c* again arrives at the point *l* of the cam the cartridge-shell carrier has made a sufficient movement to present another cartridge-shell under the feeder for the reception of a charge.

I will here remark that, instead of the priming-reservoir having a lateral movement, it may be made stationary, out of the way of the cartridge-shell carrier, and the feeder may have a lateral movement, by which it is first brought over the said reservoir and afterward

over the carrier; but I at present believe the arrangement represented in the drawings to be the best. I will further remark that instead of the cartridge-shell carrier having an intermittent rotary motion it may have an intermittent rectilinear motion.

The means of producing the rotary motion of the cartridge-shells about their own axis, while in the position in which they receive the priming from the feeder and before they receive the priming for the purpose of immediately distributing the priming around the flange or internal periphery of the head of the cartridge, are represented in vertical section in Fig. 5 and in dotted outline in Fig. 2, and are also, in part, represented in Fig. 1. They are as follows: *u* and *v* are horizontal wheels, the peripheries of which are grooved to fit the exteriors of the flanged heads of the cartridge-shells. These wheels are so arranged above the table A that, as the shells are severally brought by the carrier M to the position for receiving the priming, their flanged heads, which project below the carrier, are brought between the said wheels with their flanges within and in close contact with the grooves of the said wheels. The wheel *u* is firmly secured on an upright spindle, U, which is arranged in suitable bearings, and on the lower part of which there is a pulley, U′, round which and round a pulley, Q′, on the spindle Q, hereinbefore mentioned, there runs a band, *w*, through which and the said pulleys rotary motion is transmitted from the said spindle Q to the spindle U and wheel *u*, and the friction of the said wheel against the head of the cartridge-shell causes it to rotate about its own axis before and at the time that the priming is deposited within it. In this operation the wheel *v*, which turns freely on a stud, *v*′, attached to the table, merely serves as a rolling bearing for the cartridge-shell to keep it in close to the wheel *u* and insure its rotary motion, being turned by the friction of the shell against it. The stud *v*′ may have a spring applied, in connection with it, for the purpose of pressing it against the cartridge-shells and insuring their proper contact with the friction of the driving-wheel *u*.

By thus giving the shell a rotary or spinning motion while in the position in which it receives the priming and before it receives the priming, I am enabled to insure a more perfect and uniform distribution of the priming around the head of the shell.

Having thus described my invention, I will proceed to state what I claim as my improvement and desire to secure by Letters Patent—

1. In a machine for depositing the fulminate priming in cartridge-shells, a feeder which descends into a box, vessel, or reservoir containing the priming in a fluid or semi-fluid state, picks up the requisite quantity of priming therefrom, and again descends into or over the cartridge-shell to deposit the the priming therein, substantially as herein described.

2. Suddenly arresting the feeder in its descent over or into the cartridge-shell, substantially as herein specified, for the purpose of insuring the complete discharge of the priming therefrom.

3. The combination of a feeder, a priming-reservoir, and a cartridge-shell carrier, operating substantially as herein specified.

4. Though I do not intend to claim broadly the distribution of the priming around the shell by centrifugal action, I claim commencing the rotary or spinning motion of the shell about its axis before the deposit of the priming therein, substantially as and for the purpose herein described.

TIMOTHY J. POWERS.

Witnesses:
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