5 Sheets—Sheet 1.

M. W. FISHER.

Charging Percussion-Caps.

No. 5,928. Patented Nov. 21, 1848.

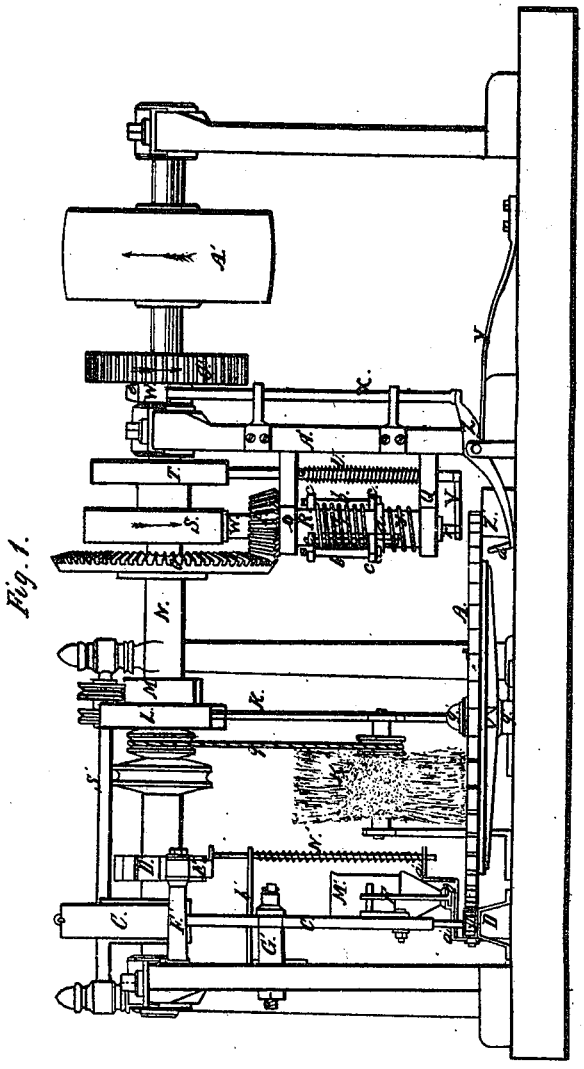

Fig. 1.

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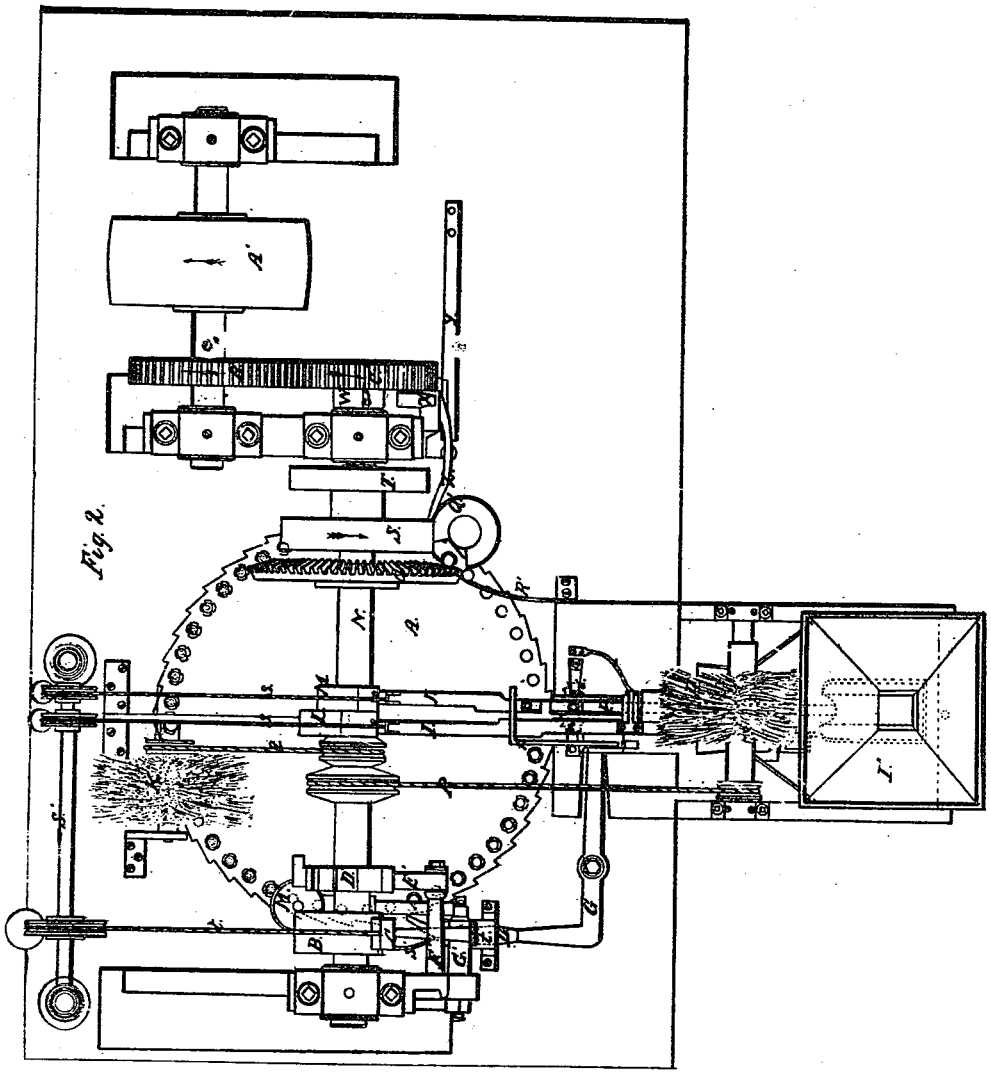
Fig. 2.



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5 Sheets—Sheet 3.

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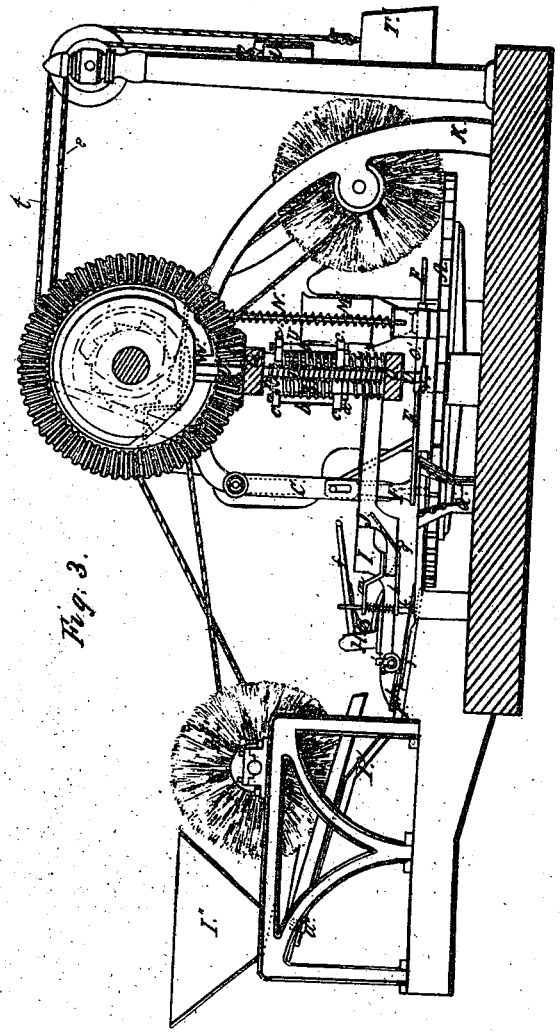

Fig. 3.

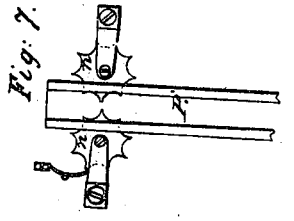

Fig. 7.

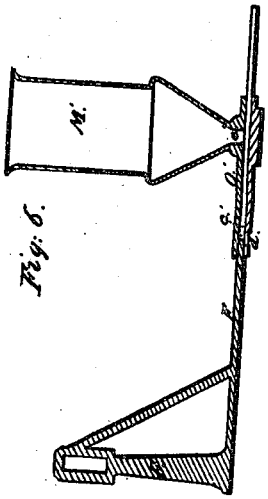

Fig. 6.

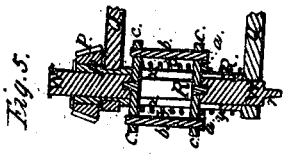

Fig. 5.

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Charging Percussion-Caps.

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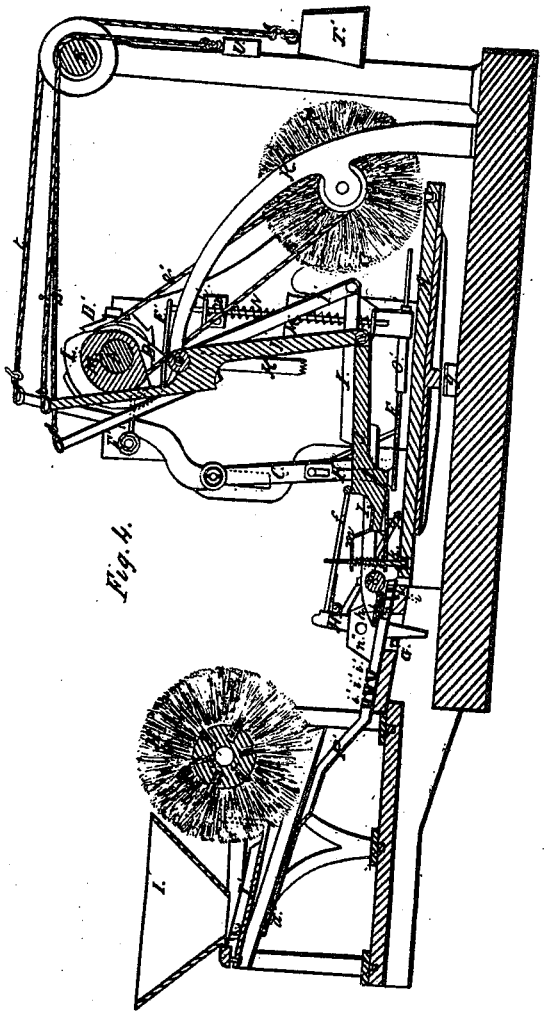

Fig. 4.

5 Sheets—Sheet 5.

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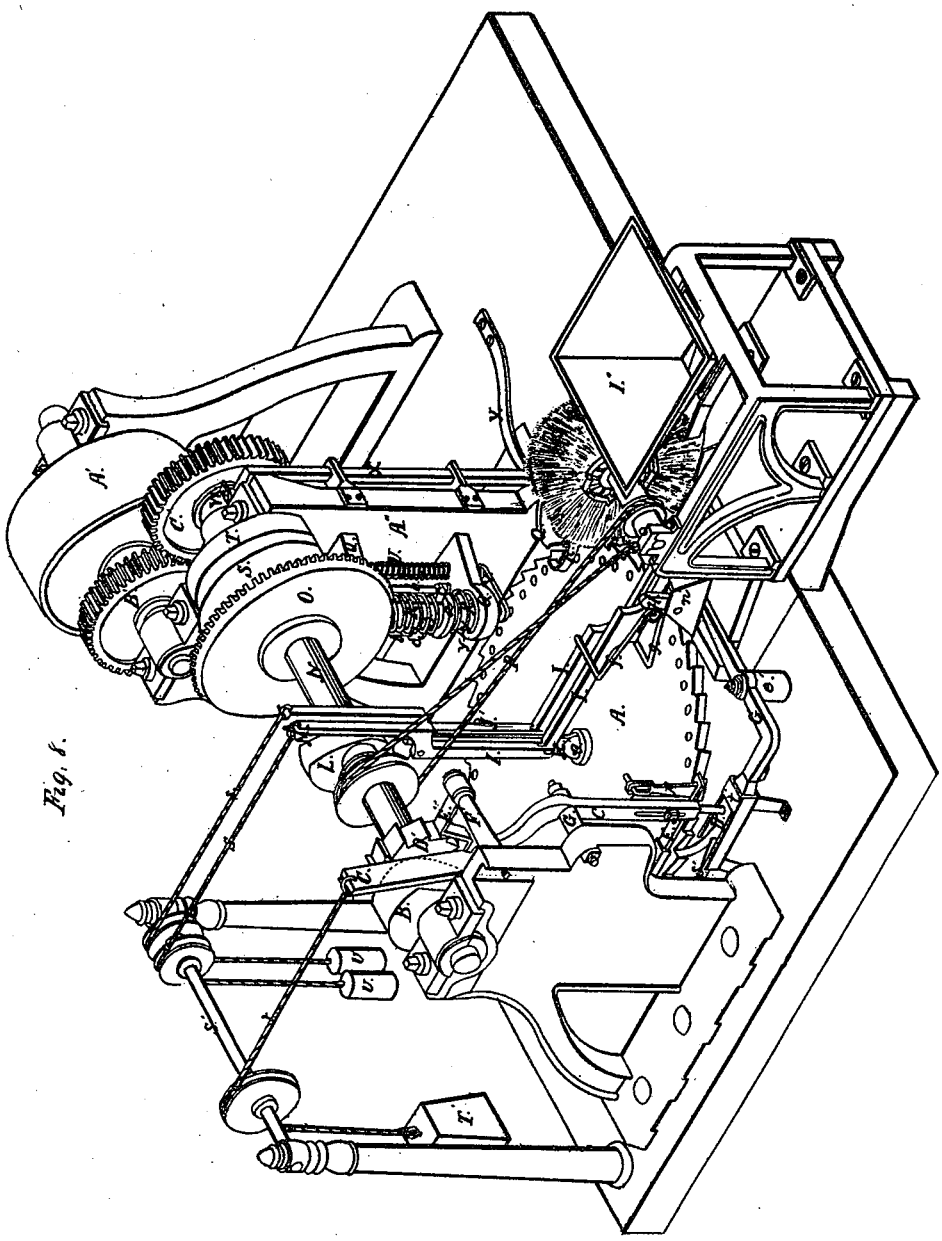

Fig. 5.

UNITED STATES PATENT OFFICE.

MARVIN W. FISHER, OF WASHINGTON, DISTRICT OF COLUMBIA.

SELF-FEEDING MACHINE FOR CHARGING PERCUSSION-CAPS.

Specification forming part of Letters Patent No. 5,928, dated November 21, 1848.

To all whom it may concern:

Be it known that I, MARVIN W. FISHER, of the city and county of Washington, in the District of Columbia, have invented a new and Improved Machine for Charging Percussion-Caps; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation, Fig. 2 a top view, Figs. 3 and 4 vertical sections, Figs. 5, 6, and 7 detached portions, of the machine, shown in detail; and Fig. 8 is a perspective view of the machine.

Similar letters indicate like parts in all the figures.

A suitable platform or base and the requisite standards to support the various parts of my cap-charging machine are first constructed.

M′ is the magazine or hopper in which the composition is placed with which the caps are charged. The magazine is supported by the tremulous base *a′*, rising from the platform and projecting over the edge of the horizontal ratchet-wheel A, in the series of vertical apertures near the periphery of which the caps are placed to receive their charge. The lower portion of the magazine is funnel-shaped, and opens into a rectangular tube, O′, in which the charger E is accurately fitted and freely slides back and forth. A circular aperture, *d′*, is formed in the under side of the tube O′, at the distance of an inch or two from the magazine, exactly corresponding in size with the aperture *c′*, Fig. 6, at the bottom of the magazine, and with the aperture *c′* in the charger E. A reciprocating movement being imparted to the charger, the aperture *c′* in the same, in passing back and forth under the outlet of the magazine, will receive the charge of composition for a cap, and will discharge the same through the aperture *d′*, as the charger is drawn back, into a cap brought immediately under the aperture by the movement of the wheel A upon its axis, in the manner hereinafter set forth.

N is the main shaft, from which all parts of the machine receive motion. Motion is imparted to the ratchet-wheel A and to the charger E by means of the vibrating lever C, suspended by and vibrating on the arm G′, projecting from the end of the machine, the cam B on the main shaft, the cord *t* connected to the upper end of C and passing to the rear over a loose pulley on the axle S′, and suspending the weight T′ at its extremity. A vertical arm, F, rises from the front end of the charger E, having a vertical slot near its upper end, through which passes an adjustable pin, projecting from the lever C, by which it is operated. A pivot at the lower extremity of the lever C takes into an aperture in the ratchet D, which communicates motion to the wheel A. The ratchet D works in the guiding-box *t′*, and is kept in contact with the teeth on the periphery of A by the spring *s′*.

The cam B is of such a form that it will force back the upper end of the lever C, and thereby will carry forward the ratchet D and the charger E, and move the periphery of the wheel A the distance of the length of a tooth, and in that position will retain them during one half the revolution of the main shaft. During the other half of the revolution of the main shaft the periphery of the cam B ceases to press back the upper end of C, and, receding toward the shaft, permits the weight T′ to draw forward the upper end of C and carry back the ratchet D and the charger E. The charger in passing back to its starting-place deposits a charge in a cap, as before described. In this manner the metallic caps placed in the series of apertures in the ratchet-wheel A receive their respective charges. The apertures in A correspond in number with the ratchet-teeth on its periphery, and are so arranged that each forward movement of the ratchet D will place one of the apertures in A directly under the aperture *d′* in the tube O′, in which the charger E traverses back and forth, as before described.

A tremulous motion is imparted to the magazine for the purpose of keeping its contents lively and preventing their clogging by the following-described arrangement of parts, viz: A vertical rod, N′, passes through an aperture in the plate *b′*, projecting from the end of the machine, and the projecting portion of the base *a′* of the magazine, in which it freely plays, being retained therein by the helical spring that incloses it and cross-pins passed through it below *b′* and *a′*. An elastic plate, E′, projecting from the arm F′, bears against the upper end of N′, and as the main shaft is

revolved the teeth of the ratchet-wheel D′ on the same strike against an angle of the plate E′, causing violent vibration to the plate, and thereby imparting the requisite motion to the magazine through the medium of the rod and spring N′.

The composition is forced into the caps in the following manner: On the opposite side of the wheel A from the magazine two arms, Q Q, project from the standard A″, which arms embrace journals at the ends of a vertical tube, R. The tube R serves as a guide and supporter to the shaft W′ of the punch *r*, which forces the composition into the caps. The shaft W′ is composed of two cylindrical parts, which rotate with and play freely up and down in the tube R. The respective parts of W′ are connected to each other and to the tube R, as represented in Fig. 5, in which *c c* are arms secured to the inner ends of the respective parts of W′, projecting out through the vertical slots *x x* in the sides of R. The extremities of the arms *c c* are connected to each other by the screw bolts or rods *b b*. The blank portion of the bolts *c c* plays freely in the apertures in the arm *c*, through which they pass. A stiff and powerful helical spring, Z, embraces the middle portion of the tube R, the ends of which bear against the arms *c c* within the bolts *b b*. A ring, *a*, loosely encircles the lower end of tube R. *y* is a helical spring encircling the lower end of R between the lower supporting-arm, Q, and the ring *a*, which, acting against the lower arm, *c*, forces up the punch-shaft W′ into the position represented in Fig. 5. A rotary motion is imparted to the tube R and the punch *r* by means of the bevel-pinion P, made fast to the upper end of R, and working into a bevel cog-wheel, O, on the main shaft. The punch *r* is of such a shape as to fit accurately into the caps. The wheel A in depth exactly corresponds with the depth of the caps. The wheel A revolves upon a journal, *g*′, made fast to the platform and passing up through its center. The edge of the wheel immediately under the punch *r* passes over and slightly rests upon the surface of a metallic block, Z′.

S is a cam on the main shaft immediately over the shaft W′ of the punch *r*. The cam S is of such a form that it will press down and have a continuous action upon the punch during about three-fourths of the revolution of the main shaft. The cam S strikes against the upper end of the punch-shaft W′ and forces down the same, pressing the punch *r* with great force into a cap, (immediately after the cam B has acted on the lever C, the ratchet D, the charger E, and wheel A, as before described.) During the time that the punch *r* is pressed upon the composition in a cap, four revolutions (more or less) are imparted to the punch by means of the guiding-tube R, the pinion P, and cog-wheel O, which perfects the solidification of the composition and gives it the requisite adhesion to the caps. During the action of the punch *r* the ratchet D and the charger E are drawn back, (by the lever C and weight T′,) and immediately thereafter the form of the cam S allows the spring *y* (on the lower portion of R) to elevate the punch *r* out of the cap, and retain it in an elevated position, while the cam B and lever C again operate upon the ratchet D, charger E, and wheel A, as before described. It will be perceived that the pressure exerted upon the upper portion of W′ is communicated to the lower portion of the same, and to the punch *r* through the medium of the spring Z. The object of this arrangement is to give an elastic bearing of the punch *r* upon the composition in the cap, so that should it explode from any cause, the punch can yield and give back, and no injury will be done to the machine or attendant.

The caps are prevented from turning while the punch is operating upon them, and also prevented from adhering to the same, and being drawn out of the apertures in the wheel, in the following manner: A vertical rod, U, passes through guiding-apertures in the arms Q Q, as shown in Fig. 1. A helical spring incloses and is connected to U, and forces it upward. An arm, V, projects at right angles from the lower end of the rod U, having a circular aperture near its extremity, through which the punch *r* freely passes as it ascends and descends.

The cam T on the main shaft is placed immediately over and operates upon the rod U, as follows: The cam T is of such a form as to cause the rod U to descend simultaneously with the punch *r*, forcing the gaged under surface of the arm V upon the flange of the cap, which retains the same, and prevents the cap from turning while the punch is operating. The cam T also retains the arm V upon the flange of the cap until the punch is elevated, and then allows the retaining-arm V to be elevated by the spring encircling U, to allow motion to be imparted to the wheel.

The caps are thrown out of the apertures in the wheel A, after the operation of charging, before described, by the following described arrangement of parts, viz: Z, Fig. 1, is a horizontal tilting lever, jointed to a fulcrum-standard, as represented. The extremity of Z farthest from its fulcrum-joint terminates in an upright punch, *d*. The opposite end of Z supports the vertical rod X, which passes up through guiding-apertures in arms projecting from the standard A″. A spring, Y, acts against the under side of the shortest portion of Z, and sustains the rod X. W is a wheel on the main shaft, from the periphery of which projects the tilting tooth *e*. As the main shaft is revolved, the tooth *e* will strike against the top of the rod X, and cause it to tilt the lever Z at a moment when the wheel A is stationary. The tilting of Z brings the punch *d* against the bottom of a cap, and throws it out of its aperture in the wheel. As the cap is thrown upward, the spring R′ gives it a lateral direction, and conducts it into the funnel Q′, open

at the side, to which a tube may be connected to convey the caps to a drawer or other suitable receptacle.

The metallic caps may be placed in the apertures in the wheel A by hand, or by the arrangement of the following-described parts, viz: I″ is a hopper, in which the caps are placed preparatory to their being deposited in the apertures in A by machinery. The caps fall from the vibrating shoe L′ at the base of the hopper into the inclined vibratory groove P′, the tubular portion of the caps passing into the groove, and the flanges resting upon the sides of the same. The periphery of the rotating brush H′ comes so nearly in contact with the sides of the groove P′ as to prevent the caps from passing the same, unless their tubes are inserted in the grooves. The inclined groove P′ is secured by a pivot, *i*, Fig. 4, at its lower end, and its upper end slides freely on a supporting-bar, a^4, Figs. 3 and 4. The shoe L′ and the inclined groove P′ are vibrated by means of a connection with the ratchet-teeth on the axle of the brush H′ by any usual or suitable contrivance. As the groove P′ is vibrated, the caps are carried down the steepest portion of the same into the position represented by *i′ i′ i′*, Fig. 4. The feeding-hand *h* on the front end of the arm I is then placed upon them, and draws them down the groove P′ until the foremost one is caught between the scalloped-edged wheels *n n*, located on each side of and projecting into P′, as shown in Fig. 7. The concavities in the peripheries of *n n* are arcs, corresponding with the tubes of the caps, and embrace nearly their entire circumference when the caps are drawn between them. One of the wheels *n* plays freely on its axis. The points radiating from the other wheel *n* are operated upon by the retaining-spring *o*, Fig. 7. The spring *o* partially retains the wheel *n* on which it acts in the position represented in Fig. 7. As the caps are drawn down, the groove P′ should the foremost one strike against a radiating point of the loose wheel *n*, it will revolve the same sufficiently to bring the cap between opposite concavities of both wheels. The elastic feeding-finger *k*, connected to the front end of the arm J, is so operated that it is placed in a cap, while it (the cap) is retained between the wheels *n n*, and draws it forward and deposits it in an aperture in the wheel A. As a cap is drawn from between the wheels *n n*, it causes a partial revolution of the wheels. The spring *o* passes over a radiating point in one of the wheels, and striking on the next point in succession retains the wheel in the proper position for the reception of another cap. The feeding-hand *h* on the front end of the arm I has a soft face that rests but slightly upon the flanges of the caps. The front end of the arm I, when the hand *h* is acting upon the caps, rests upon the roller *m′*, which traverses upon the edges of the groove P′, as represented in Figs. 3 and 4. The feeding-finger *k* passes through an aperture, and is secured to the spring-plate *l*, projecting from the under side of the front end of the arm J. It is steadied and kept in a vertical position by passing loosely through the plate *m*, projecting from the upper side of the front end of J, and to give additional elasticity to the finger it is inclosed in a helical spring placed between *m* and *l*. The arms I and J are jointed to and receive motion from the upright vibrating levers I′ J′. The levers I′ J′ are jointed to and suspended by the curved standard K. The standard K rises from the rear side of the platform, curves forward over the center of wheel A, and descends vertically to the top of the axle *g′*, to which it is connected, as shown in Figs. 1 and 8. To the upper ends of the levers I′ J′ the cords *s s* are connected, which pass to the rear over loose pulleys on the axle S′ and suspend the weights U′ U′ at their extremities, causing the upper end of I′ to bear against the cam L, and the upper end of J′ to bear against the cam M on the main shaft.

H is a vertical vibrating lever placed in the grinding-box *n′*, Figs. 4 and 8, and working on a joint-pin passing through the sides of the same. Angular arms *f* and *g* project from the upper portion of H, as represented in Fig. 8. The angular extremity of *f* passes to the right over the arms I J. The extremity of *g* passes to the right under the arms I J.

G is a horizontal vibrating lever jointed to the standard *e′*, Fig. 8. The end of G to the right of the standard *e′* passes immediately in front of the lower end of the lever H. The opposite end of G turns at right angles to the rear, and is brought directly opposite and in contact with the head of the ratchet D. When the ratchet D is drawn back by the lever C, it vibrates the lever G, causing it to throw back the upper end of H, and thereby to elevate the front ends of the arms I J by the arm *g* at the moment that the arms I J are elevated. The form and position of the cams L M permit the weights U′ U′ to draw the upper ends of the levers I′ J′ to the rear and carry the arms I J forward. The moment the ratchet D is carried forward again, the arms I J descend, placing the hand *h* upon the flanges of the caps in the groove P′, and the finger K in the cap held between the concavities of the wheels *n n*, as before described. As soon as the arms I J descend, the cams L M commence acting upon the levers I′ J′ and arms I J, causing the hand *h* to carry forward the caps in P′, and the finger *k* to place a cap in an aperture in the wheel A, as before described. The moment after the finger *k* has deposited a cap in an aperture in A, the arms I J are again elevated and carried to the front, in the mannre before described.

The rotating brush H′ is driven by the band *p*, passing around a pulley on the main shaft N. The rotating brush K′ in the rear portion of the machine acts upon the upper surface of the wheel A, near its periphery, for the purpose of removing any of the percussive composition that may chance to be deposited up-

on the wheel or flanges of the caps. The brush K′ is driven by the band *q*, passing around a pulley on the main shaft.

Having thus fully described the construction and operation of my machine for charging percussion-caps, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The manner of conducting the caps from the hopper I″ and depositing them in the apertures in the wheel A by means of the vibrating inclined groove P′, the rotating brush-wheel H′, the feeding-hand *h* on the arm J, the feeding-finger *k*, connected to the arm I, respectively constructed, arranged, and operating with each other and with the scalloped-edged wheels *n n*, the vibrating levers I′ J′, the cams L M on the main shaft, the weights U′ U′, the cords *s s*, the vibrating vertical lever H, with its arms *f g*, the vibrating horizontal lever G, and the ratchet D, combined in the manner substantially as herein set forth.

2. The combination of the cam B on the main shaft, the vibrating lever C, the charger E, and the ratchet D, with each other and with the tube O′, the magazine M′, and wheel A, for the purpose of rotating the wheel A and depositing a charge of fulminating-powder in each cap placed in the wheel A, substantially in the manner herein set forth.

3. The combination of the rotating brush-wheel K′ with the main shaft and with the wheel A, for the purpose of removing any fulminating-powder that may be scattered by the charger upon the flanges of the caps and the face of the wheel.

4. The making the shaft or shank W′ of the punch *r* elastic, substantially in the manner and for the purpose herein set forth, not confining myself to any particular manner of construction and arrangement of the punch and its shank or shaft, provided the object herein described be accomplished—viz., the permitting the punch to yield and fly back without injury to the machine in case an explosion of the fulminating-powder should take place while the punch is operating upon the same.

5. The combination of the punch-shank W′, the guiding and supporting tube R, the pinion P on the tube R, the cog-wheel O, and cam S on the main shaft with each other and with the ring *a*, and spring *y*, encircling the lower end of R, for the purpose of imparting a rotary movement to the punch *r*, pressing the same for a suitable length of time upon the fulminating mixture in a cap, and then elevating and retaining the punch while the wheel A is moved, substantially by the arrangement and in the manner herein represented and described.

6. The manner of preventing the caps from turning in the apertures in the wheel A while they are being operated upon by the punch *r*, and also preventing the caps from being drawn out of their apertures in the wheel A by the punch by means of the retaining-arm V at the lower end of the vertical rod U, inclosed by a helical spring and operated upon by the cam T on the main shaft, substantially in the manner herein set forth.

7. The manner of throwing the caps when charged out of the apertures in the wheel A into a proper receptacle by means of the cam-wheel W on the main shaft, the rod X, lever Z, punch *d*, spring Y, and guiding-spring R′, combined and operating with each other and with the open-sided funnel Q′, substantially in the manner herein set forth.

MARVIN W. FISHER.

Witnesses:
Z. C. ROBBINS,
GUY C. HUMPHRIES.