(No Model.) 3 Sheets—Sheet 1.

A. C. HOBBS, T. V. BOYDEN & C. R. RICHARDS.

BULLET PATCHING MACHINE.

No. 257,585. Patented May 9, 1882.

Fig 3.

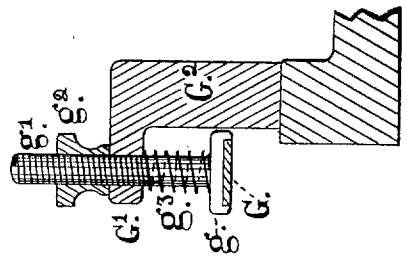


Fig 4.

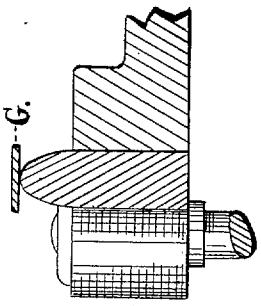


Fig 2.

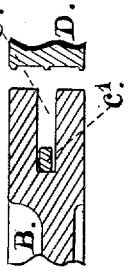
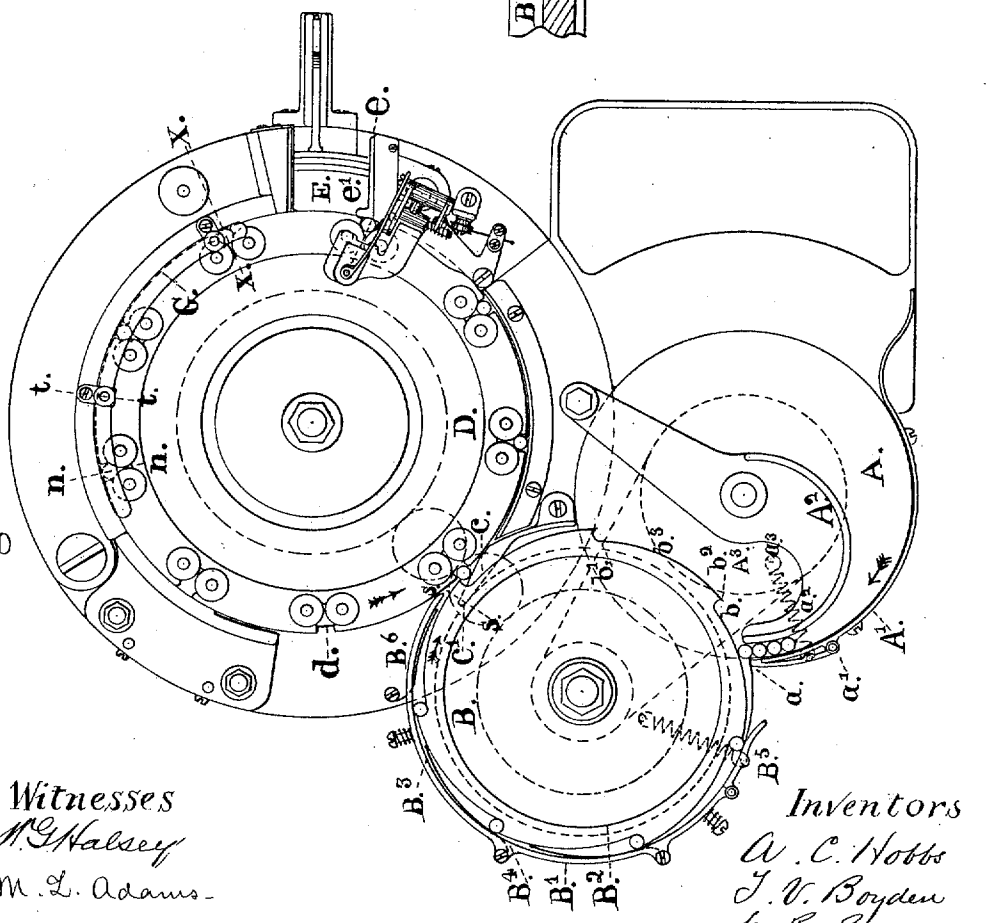


Fig 1.



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BULLET PATCHING MACHINE.

No. 257,585. Patented May 9, 1882.

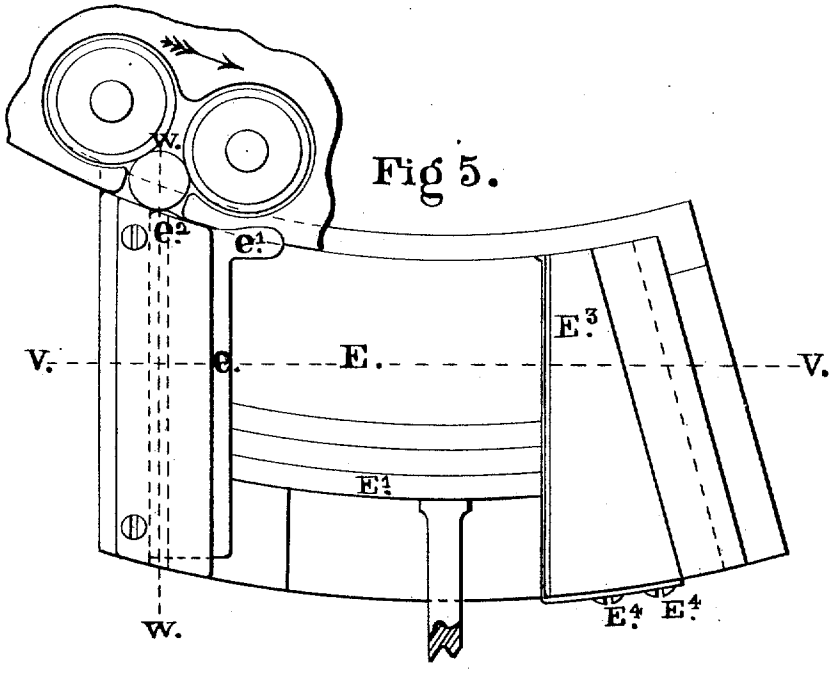

Fig 5.

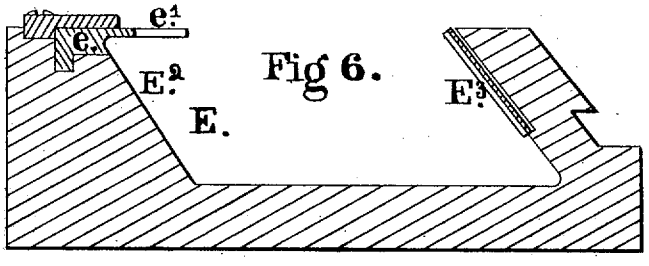

Fig 6.

Fig 7.

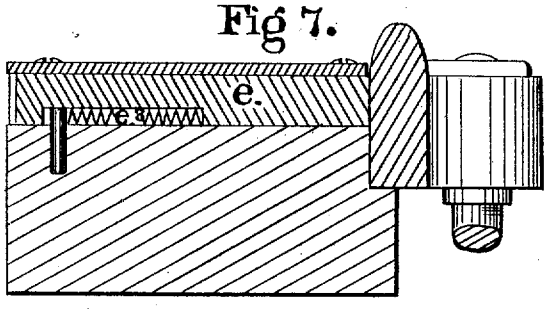

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Fig 8.

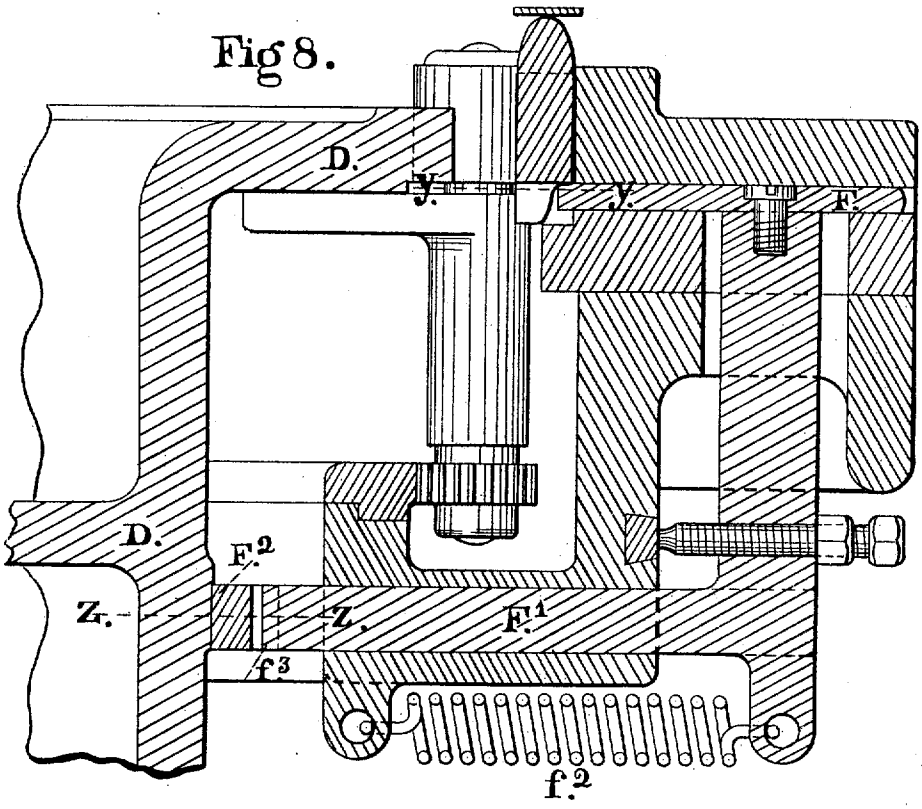


Fig 9.

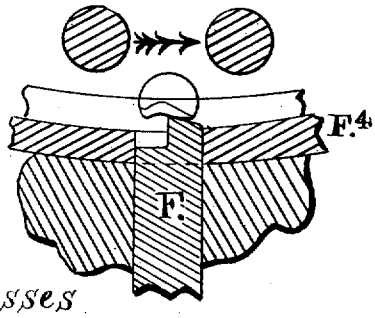
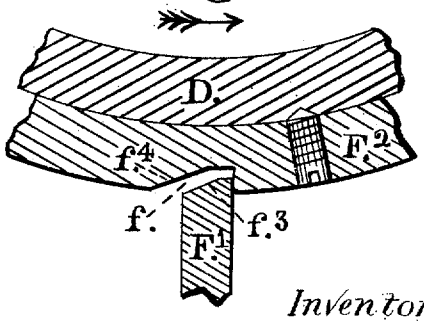


Fig 10.



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UNITED STATES PATENT OFFICE.

ALFRED C. HOBBS, THEODORE V. BOYDEN, AND CHARLES R. RICHARDS, OF BRIDGEPORT, CONNECTICUT, ASSIGNORS TO THE UNION METALLIC CARTRIDGE COMPANY, OF SAME PLACE.

BULLET-PATCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 257,585, dated May 9, 1882.

Application filed February 9, 1882. (No model.)

To all whom it may concern:

Be it known that we, ALFRED C. HOBBS, THEODORE V. BOYDEN, and CHARLES R. RICHARDS, all of Bridgeport, Connecticut, have invented certain Improvements in Bullet-Patching Machines, of which the following is a specification.

Our improvements are applicable to that class of bullet-patching machines in which bullets deposited in recesses in the periphery of a continuously-rotating horizontal disk are rolled along the concave face of a concentric wall and enwrap their lower portions with a slip of paper, which they pick up as they are successively rolled across the exterior of a mass of such slips contained in a magazine inserted into and forming a part of the concentric wall.

The first part of our invention includes the automatic feeding of bullets into the recesses in the periphery of the continuously-rotating patching-machine disk, which we accomplish by imparting to each bullet while standing upright upon its base a sidewise bodily movement in a path bisecting the circle described by the periphery of the patching-machine disk. The direction and velocity of this movement are such as to carry the bullet progressively forward with the recess which it is to occupy, and at the same time move the bullet radially inward, and thus deposit it in the bottom of the recess, after which the further progress of the bullet is effected by the rotation of the patching-machine disk.

Our invention also includes certain improvements of the bullet-patching machine. Thus we provide a device for agitating the forward ends of the slips of paper massed together in the magazine for the purpose of preventing their adhesion to each other. We construct the magazine with a yielding side wall, which bears with an elastic pressure upon the tail ends of the massed slips of paper. We employ a reciprocating bar for tucking a portion of the projecting patch under the base of the bullet preparatory to the crimping operation; and, finally, we provide an adjustable horizontal guard-rail which bears with an elastic pressure upon the tops of the bullets and prevents them from rising during their passage through the machine.

The accompanying drawings, illustrating our invention, are as follows:

Figure 1 is a top view of a patching-machine provided with our improvements. Fig. 2 is a vertical section through the line *s s* on Fig. 1, showing the groove in the face of the transfer-wheel, which admits the end of the stationary cam for forcing the bullets radially outward from the transfer-wheel. Fig. 3 is a vertical section upon an enlarged scale, taken through the radial line *t t* on Fig. 1, showing a portion of the top guide for the bullets and an adjusting-screw for regulating the position thereof. Fig. 4 is a vertical section, also upon an enlarged scale, taken through the radial line *n n* on Fig. 1, illustrating the action of the top guide upon the bullet and showing one of the elastic rollers against which the body of the bullet bears. Fig. 5 is a top view of the magazine containing the paper slips, showing a portion of the patching-machine disk and a bullet about to be rolled across the face of the magazine. Fig. 6 is a vertical section through the line *v v* on Fig. 5. Fig. 7 is a vertical section through the line *w w* on Fig. 5. Fig. 8 is a vertical section, through the line *x x* on Fig. 1, of a reciprocating tucker and mechanism for operating it. Fig. 9 is a horizontal section through the line *y y* on Fig. 8. Fig. 10 is a horizontal section through the line *z z* on Fig. 8.

In carrying out the first part of our invention—the automatic feeding of the patching-machine—we employ the ordinary friction-dial feed, by which the bullets resting upon their bases are gradually brought into column and pushed forward.

In imparting to the bullets successively the bodily sidewise movement required to introduce them into the recesses in the periphery of the patching-machine disk, we may employ either a reciprocating pusher, moving in the proper direction and with the proper speed, or we may employ a continuously-rotating hooked transfer-wheel and a stationary tangential cam.

The drawings show a friction-dial, A, of the ordinary construction, excepting that the end section, *a*, of the outermost of the two curved stationary guide-walls A′ and A² is made capable of yielding in a horizontal plane outward from the dial A by being provided with

an axis of oscillation upon the vertical pivot a', and being sustained in its normal position by the contracting-spring a^2, the inner end of which is secured to a pin, a^3, projecting downward from the under side of the dial-bed or support. By the operation of the friction-dial feed the bullets are gradually brought into single column and pushed successively outward against the periphery of our transfer-wheel B, provided with the hooks or ratchet-teeth b. The forward face of each of the teeth b is circularly recessed to enable it to partially embrace a bullet resting upright upon its base, and the periphery of the transfer-wheel from the inner edge of the recess b' to the apex b^2 of the next preceding tooth presents the convex bearing b^3, so that this part of the transfer-wheel gradually diminishes in radius, and hence affords a constant support for the bullet while the latter is being gradually pushed outward from between the guide-walls A′ and A². It is usual to make one or both of the guide-walls A′ and A² vibratory; but as this is well known and forms no part of our invention, we have not deemed it necessary to show the vibrating mechanism. The transfer-wheel B has the circumferential groove C formed in its periphery, and is surrounded by the curved guard-wall B′, which is secured to the stationary table B² immediately beneath the transfer-wheel. The bullets caught by the teeth b are successively swept away from the end of the column of bullets presented by the friction-dial. The movable end section, a, of the outer guide-wall yields, if necessary, to permit the lateral sidewise movement of the end bullet, and in yielding presses upon and forces the bullet toward the periphery of the transfer-wheel, and thus acts to fully seat the bullet in the recessed face of the tooth b. Thereafter the bullets are carried around in the arc of a circle, and are prevented from tipping over partly by means of the guard-wall B′ and partly by means of the light springs B³, the free ends of which project respectively through horizontal slots B⁴ in the curved guard-wall, and bear against the bodies of the bullets as they are carried around by the teeth of the transfer-wheel.

The end portions, B⁵ and B⁶, of the guard-wall B′ may be made flexible and arranged to spring toward the periphery of the transfer-wheel, so as to yield in an outward direction as the bullets are carried along their inner faces. The transfer-wheel is arranged in the same horizontal plane as the continuously-rotating patching-machine disk D, and is so geared thereto that its periphery and the periphery of the patching-machine disk move with like speed, the transfer-wheel rotating in one direction and the patching-machine disk rotating in the opposite direction.

Between the transfer-wheel and the patching-machine disk there is provided the stationary tangential cam c, the face of which forms a part of a right line bisecting the peripheries of the transfer-wheel and the patching-machine disk. The end c' of the cam c projects into the groove C in the periphery of the transfer-wheel. By the rotation of the transfer-wheel the bullets carried around by the teeth b are successively brought into contact with the face of the stationary cam c, and are thereby gradually forced radially outward from the transfer-wheel and made to travel in a path which ultimately bisects the circle described by the periphery of the patching-machine disk D.

The timing of the motions of the transfer-wheel and patching-machine disk is such as to keep one of the recesses d in the periphery of the patching-machine disk immediately opposite the bullet which is being pushed along the face of the stationary cam c. The bullets, therefore, forced radially outward from the transfer-wheel by the action of the stationary cam c are successively deposited in the recesses d, respectively.

In order to prevent the adhesion to each other of the slips of paper contained in mass in the magazine E, we provide along the forward side of the magazine a spring-bar, e, having at its inner end the laterally-projecting finger, e', which bears lightly upon the top of the outer stratum of paper slips in the magazine near their forward ends—that is, the ends with which the bullets in their progress through the machine first acquire contact. The inner end of the spring-bar e is provided with the rounded projection e^2, which projects slightly across the path of the bullet. As the bullet rolls across the face of the projection e^2 the spring-bar e is pushed back, and as the bullet passes along the expanding spring e^3 pushes the spring-bar e forward into its normal position. The finger e' also projects partly across the path of the bullet, and another reciprocating motion is imparted to the spring-bar e as the bullet rolls along the edge of the finger. By these reciprocating motions of the spring-bar e the under surface of the finger e' is made to rub back and forth across the edges of the outer stratum of paper slips in the magazine, and thereby tends to separate them from each other, so that the bullet in rolling along will pick up only the external slip. The mass of slips in the magazine is gradually fed toward the patching-machine disk by the usual curved follower, E′, and a device which is not a part of our invention is employed to deposit a drop of mucilage near the corner of the patch with which the bullet first acquires contact.

In order to hold the mass of slips firmly against the forward side, E², of the magazine, we provide the yielding side wall, E³, which is simply a metallic spring-plate secured to the frame of the machine by the screws E⁴ E⁴ and bearing in a forward and downward direction against the tail ends of the slips of paper massed in the magazine. After the paper slip or patch has been wrapped around the body of the bullet the projecting lower portion of the paper is folded or crimped upon the base of the bullet by the action of the usual eccentric crimping-rail.

To facilitate the crimping operation we have found it advisable to first fold or tuck one side of the projecting part of the patch under the base of the bullet, and we effect this object by means of the reciprocating tucker F, which is affixed to and carried by the slide-bar F′. The necessary inward movement of the slide-bar F′ in order to carry the tucker under the base of the bullet is permitted by the recess *f* in the cam F², adjustably secured to the cylindrical rim *f′*, which is affixed to or forms a part of, and thus rotates with, the patching-machine disk D. The spiral retracting-spring *f*³ holds the inner end, *f*⁴, of the slide-bar F′ against the face of the cam F² and causes it to drop into the recesses *f* as they are successively brought opposite to it by the rotation of the cam F². When the end of the slide-bar F′ drops into one of the recesses *f* the inner end of the tucker F moves under the bullet and tucks one side of the projecting paper patch against the base of the bullet. The tucker is then gradually withdrawn as the end of the slide-bar F′ travels along the inclined wall *f*⁴ of the recess *f*. The projecting lower portion of the patch, being thus partially tucked under the base of the bullet, is thereafter more easily acted upon by the usual eccentric rail, F⁴, which completes the crimping operation.

In their progress through the machine the bullets sometimes tend to ride upward. In order to prevent this we provide the top guard-rail, G, which bears upon the upper ends of the bullets with a yielding pressure. The rail G is supported in the heads of the vertical bolts *g*, the shanks of which project upward respectively through perforations in the horizontal arms G′, projecting laterally from the upper ends of the stationary posts G². The projecting upper portion, *g′*, of each bolt is provided with the adjusting-nut *g*², which bears upon the top of the horizontal arm G′. An expanding spiral spring, *g*³, bears at its lower end upon the head of the bolt *g*, and at its upper end upon the under side of the horizontal arm G′. By screwing or unscrewing the nut *g*², therefore, the rail G may be raised or lowered as required.

We claim as our invention—

1. In a bullet-patching machine substantially such as described, a horizontally-rotating disk provided with recesses in its periphery, in combination with a table or other support for a bullet in proximity to the periphery of the rotating disk, and a suitably-moving carrier or pusher for imparting to the bullet a sidewise bodily movement in a path bisecting the circle described by the periphery of the rotating disk for the purpose of depositing the bullet in one of the said recesses without arresting or interfering with the continuous rotation of the disk.

2. The patching-machine disk D, provided with the recesses *d* in its periphery, in combination with the hooked or ratchet-toothed wheel B and the stationary cam *c*, arranged and operating substantially as and for the purpose set forth.

3. The patching-machine disk D, provided with the recesses *d* in its periphery, in combination with the friction feed-dial A, for arranging and presenting a series of bullets in column, and a suitably-moving carrier or pusher for moving the bullets from the end of such column and carrying them along the face of a stationary guide, by which they are forced sidewise into the recesses *d* while the disk D is continuing its rotation.

4. The continuously-rotating transfer-wheel B, provided with the teeth *b*, and with the circumferential groove C, in combination with the stationary tangential cam *c*, and the continuously-rotating patching-machine disk D, provided with the recesses *d*, substantially as and for the purpose set forth.

5. The yielding end section, *a*, of the outer guide-wall of the friction-dial A, in combination with a suitably-moving carrier or pusher for moving aside successively the end bullets of the column fed forward by the friction-dial, substantially as shown and described.

6. A magazine for holding a package of paper slips or bullet-patches, in combination with a rotating disk adapted to roll a bullet across the face of the magazine, and an agitator for transversely rubbing back and forth the edges of the paper slips for the purpose of preventing the adhesion of the superposed slips to each other.

7. The finger *e′*, arranged to bear lightly upon the outer stratum of paper slips or patches contained in the magazine, and connected with the spring-bar *e*, the end *e*² of which projects partially across the path of the bullets as they are successively rolled along by the rotating disk D, as and for the purpose set forth.

8. In combination with bullet-patching mechanism substantially such as described, the tucker F, operated by means of the cam F², for tucking or folding part of the downwardly-projecting patch under the base of the bullet, and thus preparing the lower part of the patch for the action of the eccentric crimping-rail, by which the remainder of the downwardly-projecting patch is crimped upon the base of the bullet.

9. In combination with the rotating patcher-disk D, the magazine E, provided with the follower E′, and with the inclined side wall, E³, for bearing with elastic pressure upon the tail ends of the mass of slips contained in the magazine.

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