(No Model.) 3 Sheets—Sheet 1.

C. E. VAN NORMAN.

HOPPER AND DELIVERY MECHANISM FOR STUDS.

No. 502,895. Patented Aug. 8, 1893.

Fig. 1.

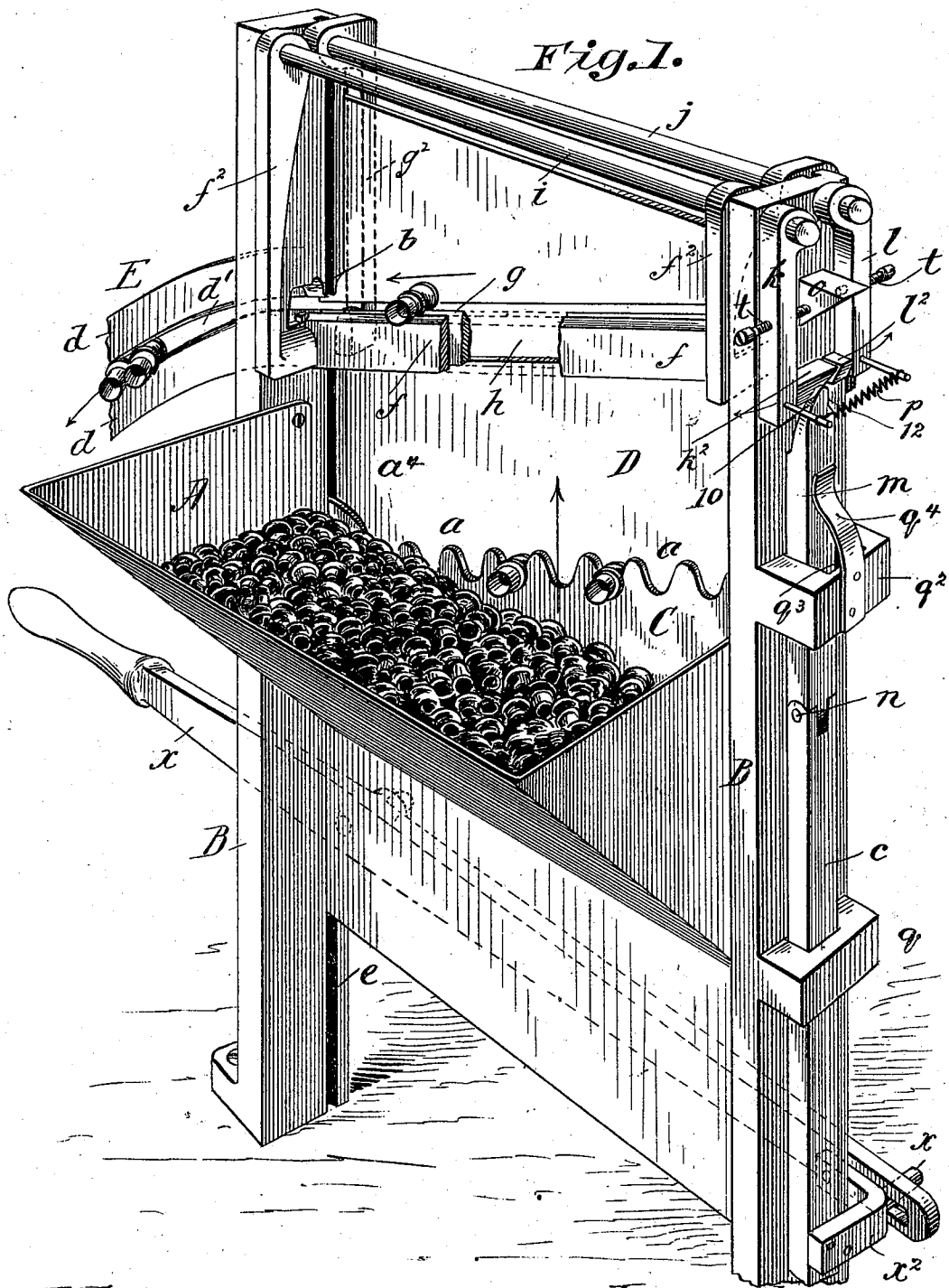

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Fig. 2.

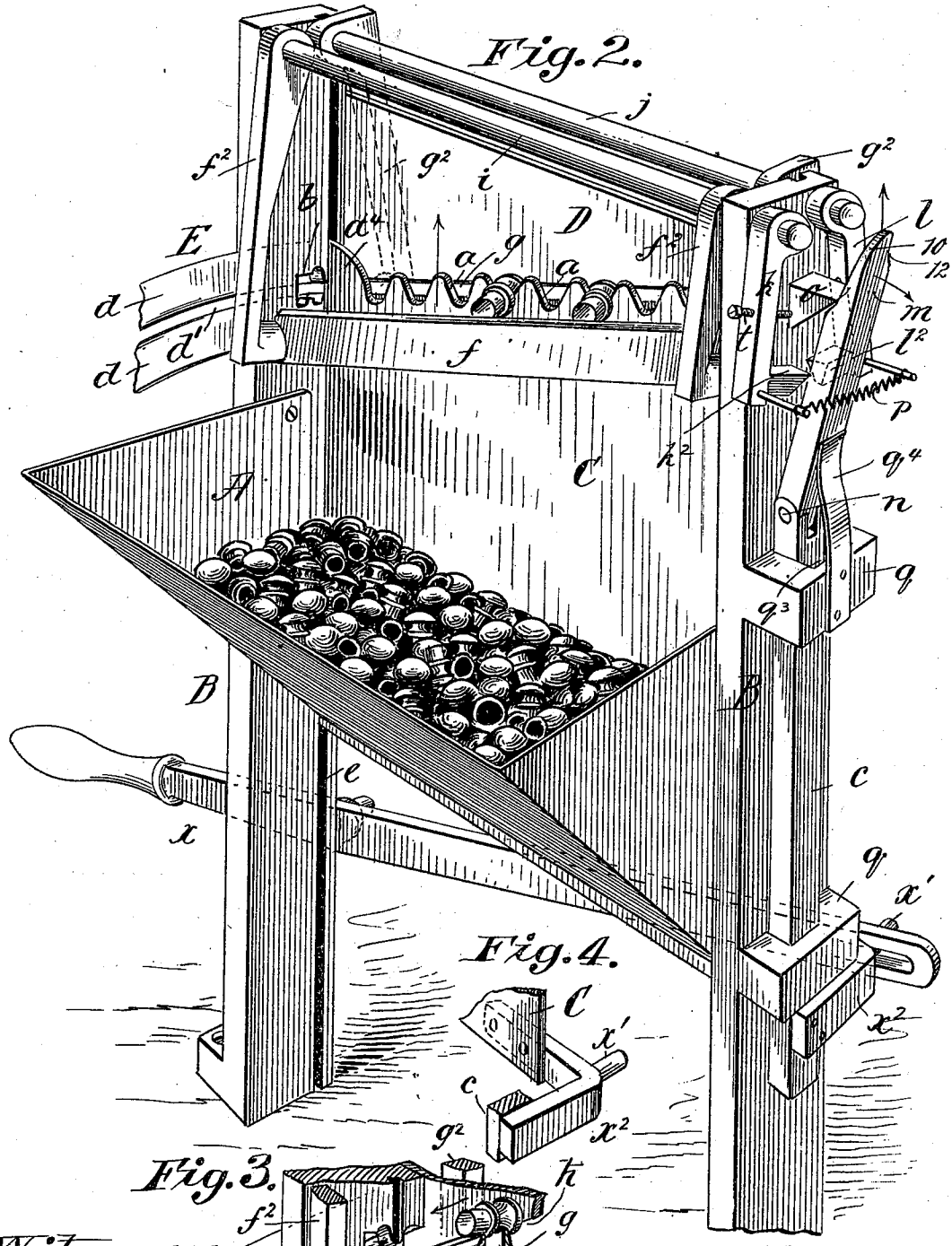
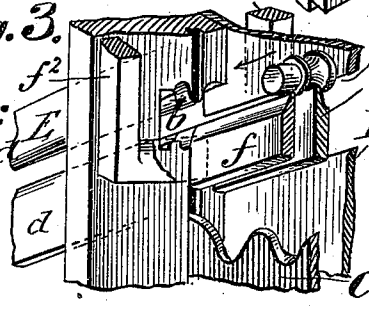


Fig. 4.

Fig. 3.



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(No Model.) 3 Sheets—Sheet 3.

C. E. VAN NORMAN.

HOPPER AND DELIVERY MECHANISM FOR STUDS.

No. 502,895. Patented Aug. 8, 1893.

Fig. 5.

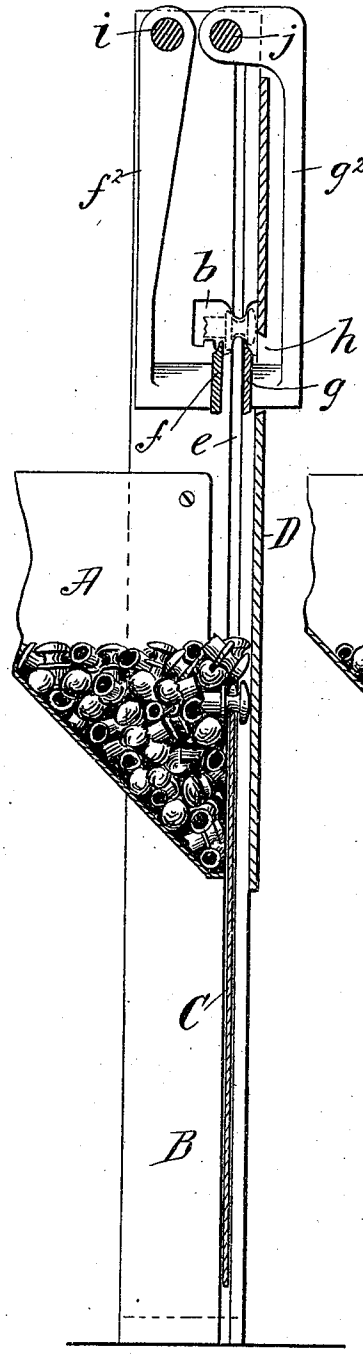


Fig. 6.

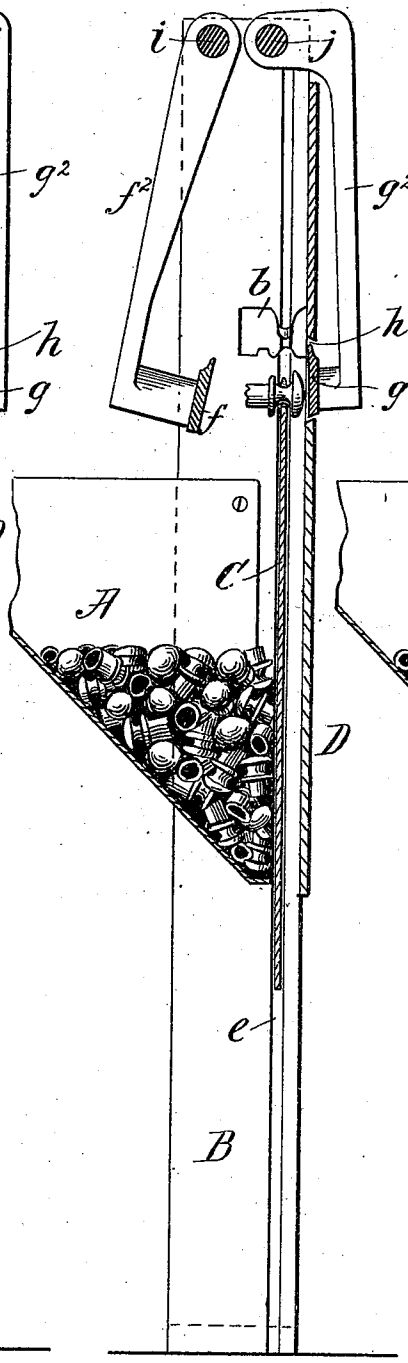
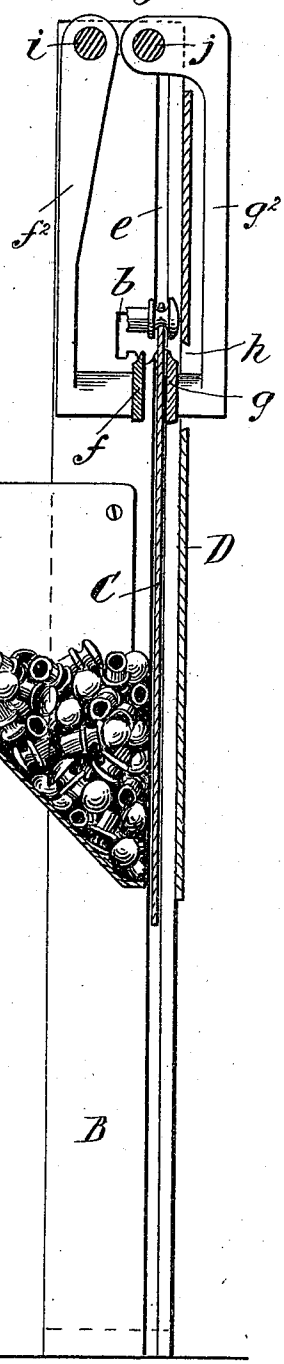


Fig. 7.



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UNITED STATES PATENT OFFICE.

CHARLES E. VAN NORMAN, OF SPRINGFIELD, MASSACHUSETTS.

HOPPER AND DELIVERY MECHANISM FOR STUDS.

SPECIFICATION forming part of Letters Patent No. 502,895, dated August 8, 1893.

Application filed May 9, 1892. Renewed February 2, 1893. Serial No. 460,785. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. VAN NORMAN, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Hoppers and Delivery Mechanisms for Studs, of which the following is a specification.

This invention relates to improvements in that class of hoppers designed for containing lacing-studs, and having in conjunction therewith mechanism for bringing the studs from a promiscuous mass into a uniform arrangement for delivery.

The objects of the invention are to improve a hopper of the class indicated to the end of securing, in its operation, the utmost certainty of the required uniform arrangement for delivery of the studs and the greatest freedom of their delivery, all clogging being avoided.

The invention consists in the arrangement or combination of parts substantially as will hereinafter more fully appear and be set forth in the claims.

In the accompanying drawings:—Figure 1 is a perspective view of the improved hopper showing the movable serrated plate as beginning its upward movement. Fig. 2 is a view similar to Fig. 1, the serrated plate being, however, shown as approaching the limit of its upward movement. Figs. 3 and 4 are perspective views of portions of the mechanism which will be hereinafter more particularly referred to. Figs. 5, 6, and 7 are vertical cross sections of the hopper mechanism with the parts thereof in various positions as assumed during different stages of the operations thereof.

In the drawings A represents the upwardly open hopper supported by and between the standards, B, B, the front wall of the hopper downwardly converging, substantially as shown. The rear boundary of the hopper is, in part, formed by a plate C, which is adapted for a reciprocatory movement in a vertical plane, and, in part, by the plate D, which is fixed to and supported by the rear of the standards, B, B. The upper edge of the said plate, C, has a regular series of serrations, *a*, the same being arranged to incline from one end of the plate to the other, substantially as shown. The reciprocatory movement of the serrated plate is to be imparted in any manner which may be approved, a means shown merely to indicate said capability consisting in the handle-lever, *x*, which is pivotally mounted on one of the standards, B, and has a connection with the plate C, through its engagement with the stud, *x'*, on the angle piece, x^2, which is attached to the said plate and to the vertically reciprocating cam-operating bar, *c*, which will be hereinafter referred to. The said plate is constrained in its reciprocatory movements by having its vertical edges enter the vertical guide grooves, *e*, *e*, within the inner faces of the standards. The notches between the dividing portions of the serrations conform more or less nearly and peripherally to the necks of the lacing-studs between their heads and shoulders, and the plate, D, as clearly shown in Fig. 5, is in a vertical plane rearwardly separated from the plane of the plate, C, by a distance about corresponding to the distance axially of the stud between the top and under side of the head.

There is, through one of the standards, B, as shown in all of the drawings, an aperture, *b*, having a form more or less nearly corresponding to a longitudinal section of the lacing-stud, the median line of the aperture, corresponding to the axis of the stud, being horizontal, as shown; and from the farther and outer side of the standard there is the beginning of a feed-way, E, comprising separated and downwardly inclined parts, *d*, *d*, with the slot, *d'*, between them for engaging the necks of the studs, as shown in Fig. 1, which slot merges into, or is a continuation of, the said aperture, *b*.

Between the two standards, B, B, there is an inclined track or run-way, which has a downward inclination, its lower end terminating at the inner face of the standard, B, next to the said aperture, *b*. This run-way is constituted by parallel thin-edged bars, *f* and *g*, having, when in their normal positions, such a separation, substantially as shown in Figs. 1, 3, and 5, that, with a lacing-stud transversely lying upon their top edges, the neck of the stud next to the head will be engaged by the edge of the bar, *g*, while the shank and shoulder of the stud, which latter divides the shank and neck, will have the sliding engagement with the edge of the bar, *f*.

It will be plain, by an inspection of the drawings, that with a quantity of the lacing-studs in the hopper, and the serrated plate so lowered that its upper edge is below the top of the mass of studs as seen in Fig. 5, those studs which are at the top and rear-most will dispose themselves above the serrated edge being rearwardly restrained by the said back plate, D. Now, on raising the plate, the serrated upper edge thereof will engage, by its neck, and in the disposition indicated, usually at least one of the studs, carrying it upwardly in the manner more particularly seen in Figs. 2 and 6. As the serrated stud-carrying upper edge of the plate, C, approaches and reaches the track-way constituted by the aforesaid bars, *f*, *g*, said bars have separating movements laterally relative to the plane of the plate, C, the bar, *f*, having an extent of movement forwardly considerably in excess of the movement rearwardly of the bar, *g*. The separating movements of the said bars permit the studs which may be engaged by the serrated plate to be carried, without obstruction, above the run-way constituted by said bars, which latter, then, return to their normal positions, Figs. 1 and 7, so that as the serrated plate next recedes downwardly toward its normal position the stud will come upon the top of the run-way and be then free to slide or roll down thereon to and through the aperture, *b* and into the feed-way, E.

I will now proceed to describe the means whereby the separation of the said bars and the resumption of their approached position are accomplished: The said bars are supported at the lower extremities of paired arms, f^2, f^2, and g^2, g^2, which at their upper ends are respectively fixed upon rock-shafts, *i* and *j*, horizontally mounted in suitable bearings of the said standards, said shafts projecting through and beyond the outer face of one of the standards and receiving the fixed, depending arms, *k* and *l*, each of which has projected toward the other, the members k^2, and l^2, to receive the impingement thereagainst of the cam-surfaces, 10 and 12, which are formed at the upper extremity of the bar, *m*, which is connected to the aforementioned vertically reciprocating bar, *c*, by a pivot joint as indicated at *n*. The cam-ended bar, *m*, at the completion of the upward thrust thereof has its swinging movement away from the face of the standard so as to be carried entirely out of engagement with the impingement members, k^2, l^2, of the rock-shaft arms to permit the bars, *f* and *g*, to resume their approached positions (from which they had been forced by the cam-surfaces 10 and 12, acting on the arms, *k* and *l*) by reason of the bar being impinged upon by,—or itself impinging against,—the projection, *o*, which stands out from the face of the standard at a suitable height relative to the height of the members, k^2, and l^2, of the rock-shaft arms. The said arms, *k* and *l* have the retracting spring, *p*, applied thereto, substantially as shown for bringing them together when permitted by the retirement of the cam-ended bar from the members of said arms.

The reciprocatory bar, *c*, and the cam-ended bar, *m*, which is pivoted thereto, are constrained in their proper movements vertically alongside of the standard by the apertured blocks, *q* and q^2, the aperture, q^3, in the latter being considerably wider than the thickness of the bar, *m*, so that even before the pivot-joint, *n*, rises above the block, q^2, said bar, *m*, may commence to have its outward swinging movement. The spring, q^4, maintains the bar, *m*, closely against the face of the standard, except when the bar is upwardly forced by the means described.

The degree of normal separation between the track-bars may be determined by the adjustment of the screws, *t*, *t*, which by their abutment against the projected piece, *o*, limit the approach of the arms, *k* and *l*, and consequently the approach of the track-bar carrying arms, f^2 and g^2. It will be observed that the series of regularly arranged serrations, *a*, terminate just within the upper corner of the plate, C, which is next to the standard which has said aperture, *b;* and that such corner is somewhat upwardly extended above the general line of arrangement of the series of serrations, as seen at a^4, its top edge being in the form of a cam downwardly and inwardly inclining, as seen. The purpose of this formation is to prevent more than one stud from lying at the base of the curved portion, a^4; that is, to cause a stud which may incline to lie on the stud which is in the base of the recess next to part a^4, to fall off into the hopper.

By the formation of the cam-impingement portions, k^2, 10, and l^2, 12, the timing of the separating movements of the track-bars, *f* and *g*, is assured so that, as already mentioned, the bar, *f*, has a considerable portion of its movement forwardly before the bar, *g*, begins to move rearwardly. The object of such manner of operation will be thus explained:—if a stud, brought up by a previous upward play of the serrated plate, and settling on the track-way fails to roll down such track-way clear away from over the hopper, before the next operation of the mechanism, should the rear bar, *g*, move rearwardly while the shank of the stud is still supported by the forward bar, *f*, the stud would be carried rearwardly and be jammed into the border of the aperture, *h*, formed in the back plate for the accommodation of the bar, *g;* but because of the movement of bar, *f*, earlier than that of bar, *g*, the forward support for the remaining stud is removed, and then its shank end will swing down and the stud will fall from engagement with the bar, *g*.

I claim—

1. In hopper and delivering mechanism for lacing-studs or eyelets, the combination with a hopper, of a vertically reciprocatory plate

having its upper edge inclined and serrated, playing through the hopper chamber, a track-way for the studs above the hopper, consisting of inclined and normally slightly separated bars which range in parallelism next to and at either side of the plane of movement of the plate, and means for imparting separating movements to said bars, substantially as described.

2. In hopper and delivering mechanism for lacing-studs, the combination with a hopper of a vertically reciprocatory plate, having its upper edge serrated, playing through the hopper chamber, a track-way for the studs above the hopper consisting of normally slightly separated bars which range in parallelism next to and at either side of the plane of movement of the plate, rock-shafts carrying arms on which said bars are supported, and also having arms provided with cam-impingement portions, means for reciprocating the serrated plate, and a bar adapted to be reciprocated, and, by impingement against said portions of the rock-shaft arms, to effect the separation of the track bars, substantially as described.

3. In a hopper and delivering mechanism for lacing-studs, the combination with a hopper, of a vertically reciprocatory serrated plate having a movement through the hopper chamber, separated bars, *f*, *g*, and the carrying arms, f^2, g^2, the rock-shafts, *i* and *j*, the arms *k* and *l*, fixed thereon having cam-impingement members, k^2 and l^2, the bar, *m*, having a movement between said members, k^2, l^2, and adapted for the swinging movement of withdrawal from between said members, and a spring for bringing the arms, *k* and *l*, together, substantially as and for the purposes described.

4. In hopper and delivering mechanism for lacing-studs, in combination, a hopper, a vertically reciprocatory, serrated plate, the rock-shafts, *i* and *j*, having the arms, f^2, g^2, supporting the track bars, *f*, *g*, and the arms, *k* and *l*, having cam-impingement portions, an abutment piece between said arms, and screws adjustable to limit the degree of approach of said arms, and the spreading bar, *m*, substantially as described.

5. In hopper and delivering mechanism for lacing-studs, in combination, a hopper, a vertically reciprocatory plate, the rock-shafts, *i* and *j*, having the arms, f^2, g^2, carrying the track bars, *f*, *g*, and the arms, *k* and *l*, having cam-impingement portions, and a retracting spring for each thereof, the abutment piece, *o*, and the slide bar, *c*, having the bar, *m*, pivoted thereto, and the spring, d^4, guiding devices for said bars, and means for imparting reciprocatory movements to the serrated plate and said bars, substantially as and for the purposes set forth.

6. In hopper and delivering mechanism for lacing-studs, the standards, B, B, the hopper, A, the serrated plate, C, adapted for a reciprocatory movement through the hopper, the cam-operating bar *c*, movable on the side of one of the standards and the angle-piece connecting said bar and the serrated plate, and a reciprocating device connected to said angle piece, substantially as described.

7. In hopper and delivering mechanism for lacing-studs, in combination, the standards, B, B, one thereof having the aperture, *b*, through it, and the feed-way, E, leading outwardly from said aperture, the plate C, with the inclined and serrated upper edge, and the separable inclined track-bars, *f* and *g*, at each side of and normally adjacent the said plate, and leading to said aperture, substantially as described.

8. In hopper and delivering mechanism for lacing-studs, in combination, the standards, B, B, one thereof having the aperture, *b*, through it, and the feed-way, E, leading outwardly from said aperture, the plate, C, with the inclined and serrated upper edge, and said plate, having its edge at the end toward said aperture formed with the downwardly and inwardly inclined portion, a^4, and the separable inclined track-bars, *f* and *g*, at each side of and normally adjacent the said plate, and leading to said aperture, substantially as described.

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