May 29, 1928. 1,671,700

J. M. CLAVIN ET AL

MACHINE FOR DELIVERING ARTICLES IN MEASURED QUANTITIES

Filed July 8, 1925 2 Sheets-Sheet 1

Fig. 1.

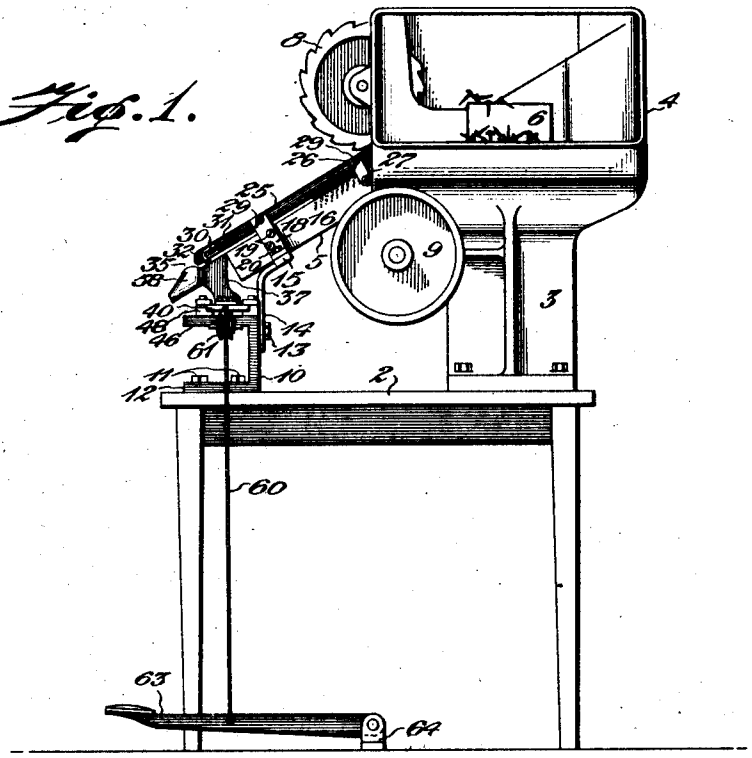
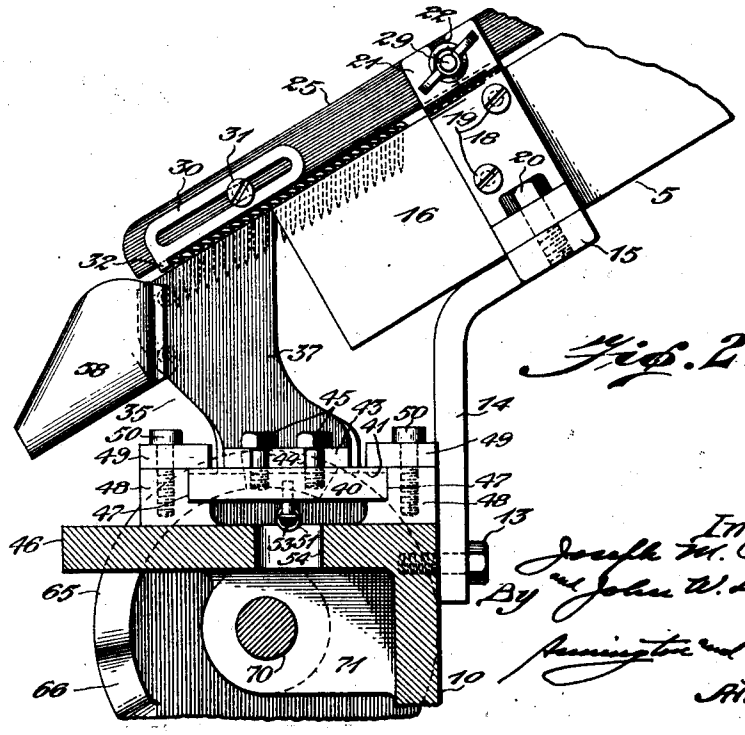


Fig. 2.



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Fig. 3.

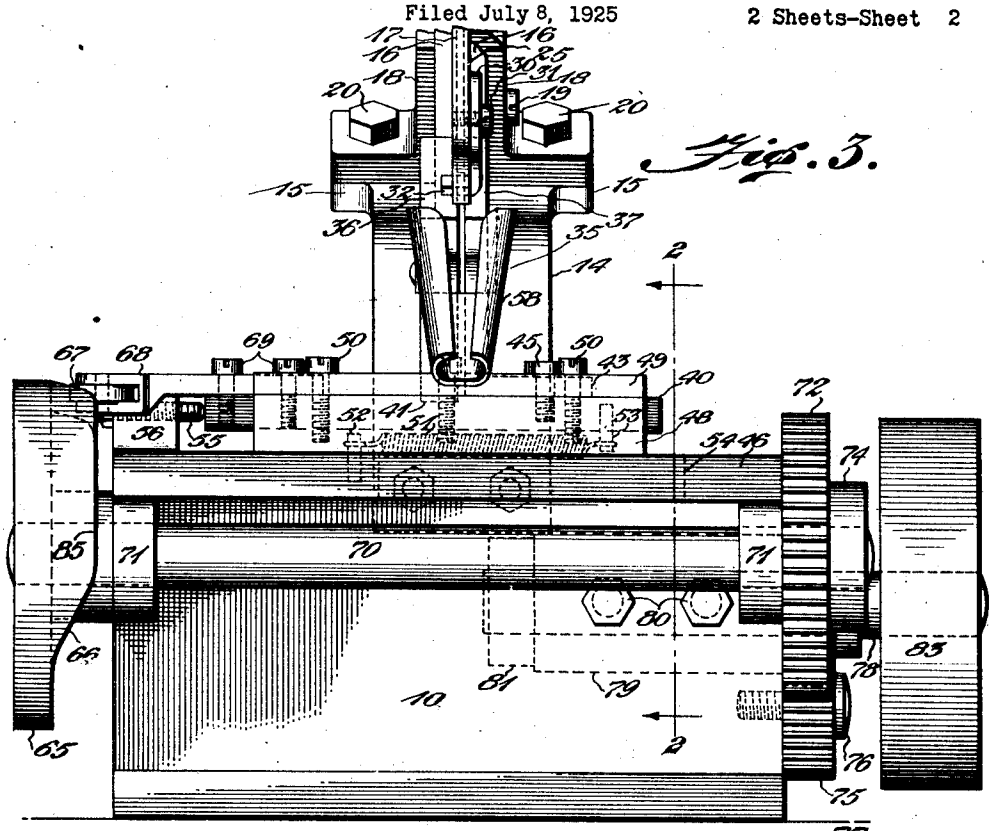
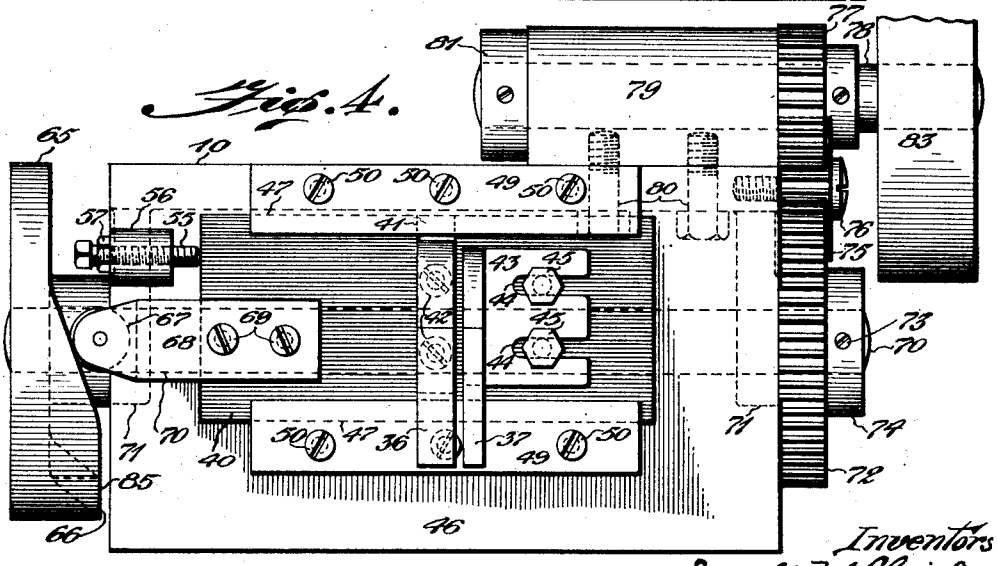


Fig. 4.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR DELIVERING ARTICLES IN MEASURED QUANTITIES.

Application filed July 8, 1925. Serial No. 42,221.

This invention relates to machines for feeding articles in measured quantities, and particularly to machines for feeding tacks, nails, screws, rivets, bolts or the like, to deliver a specified number for packaging in an envelope or other container.

A principal object of the invention is to provide a machine of the type specified in which the nails or other articles are fed continuously from a hopper or other source of supply to a point where they are counted and apportioned in definite number and then delivered in groups for packaging.

Another object of the invention is to provide a machine of the type specified which is positive in action, accurate as to the counting of the articles, and efficient in operation for the purpose explained.

Another object of the invention is to provide a machine of the type specified which is adjustable for counting and apportioning the articles in accordance with various requirements.

Another object of the invention is to provide a machine of the type specified which is simple in construction, proof against derangement or getting out of order, and durable in use over long periods.

Further objects of the improvement are set forth in the following specification which describes a preferred embodiment of the invention as illustrated by the accompanying drawings. In the drawings:

Fig. 1 is a side elevation of a machine embodying the invention, shown as applied to use for delivering tacks, nails, screws, rivets, bolts or the like from a hopper and arranged to be operated manually from a foot-lever;

Fig. 2 is an enlarged side elevation of the counting and delivering mechanism of the machine, part-sectional on the line 2—2 of Fig. 3, showing it as adapted for operation by power-driven means;

Fig. 3 is an enlarged front elevation of the counting and delivering mechanism of the machine, showing it connected to be continuously operated from a belt-pulley; and

Fig. 4 is a plan view of the counting and delivering means, also showing its power-driven operating means.

The improved machine consists in general of means for continuously feeding tacks, nails, screws, rivets, bolts or other articles from a source of supply and collecting and segregating groups of said articles in definite number, according to the adjustment of the counting means, which said groups are thereafter released to deliver to an envelope, bag, carton or other container presented to the delivering means.

In Fig. 1 of the drawings 2 designates a bench or table on which the improved machine may be mounted to provide for convenience of operation either manually or by power-driven means. The table 2 supports a bracket or standard 3 surmounted by a hopper 4 in which is contained a supply of the articles to be counted and delivered, such as tacks, nails, screws, rivets, bolts, or even articles of other shape and form; it being understood that the term nail hereinafter used in the specification and claims is to be considered in a general sense as designating any article to be fed and delivered in measured quantities by the machine.

The hopper 4 may be of any preferred type having an inclined chute or conduit 5 leading from its side and provided with a suitable channel or raceway through which the nails or other articles slide. Fig. 1 illustrates a conventional type of hopper 4 (shown with its cover removed) having means within its interior, such as a reciprocating blade 6, for agitating the nails or other articles to cause them to be thrown upwardly to be caught in an inclined tray or sluice which directs them into the raceway of the chute 5. Suitable means such as the rotating toothed wheel 8 is generally employed for acting on the nails or other articles to kick them into position for their shanks to enter the raceway in the chute 5, and the operating mechanism of the hopper is usually driven by power, for example by means of a belt-pulley 9 connected to a motor or line shaft by a driving belt not herein illustrated. The hopper and feeding means may be of any well-known arrangement such as generally used in the art, and the present invention relates more particularly to the counting and delivering means employed in connection therewith.

Beneath the lower end of the slotted chute or conduit 5 is mounted an angle-shaped bracket or support 10 which may be fastened to the table 2 by means of bolts 11 passing through its foot 12. Bolted to the back of the bracket 10 at 13 is an upright

arm 14 which is inclined rearwardly at the top and provided with a lateral bridge-piece 15 which serves as a rest for the lower end of the chute 5. Referring to Figs. 2 and 3, the chute 5 may consist of two vertical bars or plates 16 arranged in opposed relation with a slot or channel 17 therebetween forming the raceway through which the articles are fed. The two bars or plates 16 are preferably adjustable toward and away from each other to regulate the width of the raceway 17 in accordance with the size of the articles to be fed therethrough. That is to say, for tacks or small nails the plates will be set closer together than for screws, bolts or other larger articles, the adjustment being such that the shanks of the nails or screws will slide freely in the raceway with the heads of the nails resting on the upper edges of the side-plates 16 to prevent them dropping down therethrough, see Fig. 2. Angle-shaped brackets 18 are screwed to the sides of the bars or plates 16 at 19 with their feet fastened to the top of the cross-rest or bridge-piece 15 on the arm 14 by means of bolts 20. One of the brackets 18 extends upwardly above the top of the chute 5 and is formed with an offset ear or extension 21 having a slot 22.

Extending parallel to and in spaced relation with the top of the chute 5 is a longitudinal bar 25 which overlies the raceway in the chute to serve as a guard to prevent the nails or other articles from crowding and riding up therein. The bar or guard 25 is supported at its upper or rearward end by a cleat 26, see Fig. 1, which is fastened to the side of the chute 5 by means of a screw 27. The upper end of the cleat 26 is slotted to receive a thumb-screw 29 screwed into the side of the bar or guard 25. A similar thumb-screw 29, received in the slot 22 of the extension 21 on the bracket 18, is screwed into the side of the bar or guard 25 to hold the lower end of the guard in place. By loosening the thumb-screws 29 the bar or guard 25 may be raised or lowered with respect to the top of the chute 5 to regulate the spacing therebetween in accordance with the thickness of the heads of the nails or other articles to be fed through the chute. The bar or guard 25 extends forwardly beyond the lower end of the chute 5 and carries an adjustable detent or holdback element 30 for restricting the feed of the nails or other articles. The detent or holdback 30 consists of a slotted plate abutting the side of the guard 25 and fastened thereto by means of a screw 31 inserted through its slot. The holdback 30 has a detent-finger 32 bent at right-angles to its end and extending in under the guard 25 as shown more particularly in Fig. 3. The holdback or detent-member 30 is adjustable longitudinally of the bar or guard 25 by releasing its screw 31 so that it may be set with its finger 32 in definite relation to the end of the chute 5 to regulate the number of nails or other articles feeding from the chute into the counting-receiver or delivery magazine 35 of the machine.

The receiver or magazine 35 consists in a slotted extension of the chute 5 which is slidable across its end. Referring particularly to Figs. 2, 3 and 4, the counting-receiver or delivery-magazine 35 may be conveniently constructed from two parallel plates 36 and 37 projecting upwardly from a horizontal base-plate or slide 40. The plate 36 is preferably fast on the slide 40, being set into a slot 41 and fastened in place by screws 42, see Fig. 4. The plate 37 is mounted for adjustment on the slide 40 to regulate the distance between it and the fixed plate 36, any suitable means being provided for this purpose. As shown in Figs. 2, 3 and 4, the plate 37 is formed with a foot 43 resting on the top of the slide 40 and provided with slots 44 for receiving bolts 45 which clamp it in position. By releasing the bolts 45 and sliding the plate 37 the width of the opening between the plates 36 and 37 may be adjusted in conformity with the width of the raceway in the chute 5 as regulated by the size and shape of the articles to be fed from the chute into the counting-receiver or magazine 35.

The slide 40 is supported above the upper shelf or platen 46 of the bracket 10 and arranged to slide longitudinally thereof in guideways 47 formed in raised ribs or tracks 48. Suitable gibs 49 fastened to the top of the tracks 48 by screws 50 overlap the edges of the slide 40 to hold it in place. Referring to Fig. 3, a coil-spring 51 is anchored at one end to a pin 52 driven into the shelf 46 and extends beneath the slide 40 with its opposite end fastened to a pin 53 driven into the under side of the slide at the right-hand end thereof. A longitudinal opening 54 in the shelf 46, see Fig. 2, provides access for applying the spring to place. The spring 51 tends to move the slide 40 to the left, as viewed in Figs. 3 and 4, and a stop-screw 55 screwed through a lug 56 projecting above the top of the shelf 46 acts to limit the movement of the slide in this direction. The stop-screw 55 is adjustable in the lug 56 to regulate the position of the slide 40 to bring the nail-receiving opening in the receiver or magazine 35 in register with the raceway 17 in the chute 5. After the stop-screw has been adjusted for this purpose a check-nut 57 at its end is set up against the lug 56 to lock the screw in place.

Any suitable means may be provided for shifting the slide 40 to the right after the magazine has received its load or charge of nails or other articles, whereby to segregate

the group of nails counted or apportioned in the magazine and to deliver them to an envelope or other container in which they are to be packaged. The receiver or magazine 35 is preferably provided with a spout 58 on its outer side into which the nails or other articles drop after the magazine has been moved to the right to release the nails from the detent-finger 32 on the holdback 30. The bottom of the spout 58 is rounded and formed with a contracted mouth which may be entered into the envelope, sack or other container into which the nails are to be delivered.

In Fig. 1 of the drawings the slide 40 is illustrated as being connected to a wire or cord 60 which travels over a pulley 61 at the end of the bracket 10. The lower end of the cord 60 is attached to a foot-lever 63 pivoted in a bearing 64 fastened to the floor on which the table 2 stands. By pressing the foot on the lever or treadle 63 the operator, standing at the front of the machine, may operate the counting and delivering means manually. Each time the foot-lever or treadle 63 is pressed down it will draw the slide 40 to the right to carry the magazine 35 across the front of the chute 5, thus displacing the group of nails or other articles collected in the magazine beyond the control of the holdback 30 so that the nails will be released to drop down into the spout 58 to deliver into the envelope or other container held in position by the operator. It will be understood that during this operation the magazine 35 slides across the end of the chute 5 with its plate 36 closing the raceway 17 in the chute to prevent the nails feeding therefrom. When the pressure on the treadle is released the spring 51 returns the slide to first position as illustrated in Figs. 2 and 3, whereupon a fresh charge of nails will feed into the magazine with the number regulated by the setting of the holdback 30. In this way the device may be operated intermittently to count and deliver any required number of nails or other articles to the envelopes or other containers presented to the delivery spout on the magazine. As illustrated in Fig. 2 the holdback 30 is adjusted to allow ten nails to feed into the collecting-magazine 35 before the feed is arrested, this being the usual number employed for packaging with a pair of rubber heels with which they are used. In other cases the holdback 30 may be set so that a greater or less number of articles are counted and collected in the magazine for delivery to the container in accordance with varying requirements.

To provide for the automatic operation of the machine power-driven means may be employed for reciprocating the slide 40 to move the magazine 35 back and forth across the open end of the chute 5. Figs. 2, 3 and 4 of the drawings illustrate one form of operating means for this purpose comprising a rotating cam 65 which acts to traverse the slide 40. The cam 65 may be of the disk type having a hump or swelling 66 projecting from its side face near its periphery and adapted to be engaged by a roller 67 journaled on a forked arm 68 fastened to the top of the slide 40 by means of screws 69. As the cam 65 rotates the roller 67 travels up the incline of its hump 66 to force the slide 40 to the right, as viewed in Figs. 3 and 4, the spring 51 tending to maintain the roller in contact with the face of the cam while returning the slide to the left to the extent regulated by the stop-screw 55.

The cam 65 is mounted on a shaft 70 journaled in bearings 71 which may be formed as a part of, or attached to, the bracket or standard 10. At the right-hand end of the shaft 70 is a spur gear 72, held fast thereon by a set-screw 73 in its hub 74, and arranged to mesh with an idler-pinion 75 journaled on a stud 76 screwed into the side of the bracket 10. The idler 75 is driven from a pinion 77 on a countershaft 78 which is journaled in a bearing 79 fastened to the rearward side of the bracket 10 by means of bolts 80. The countershaft 78 has a collar 81 at one end for holding it from longitudinal movement in its bearing and carries a pulley 83 at its opposite end which may be driven from a suitable belt, not herein shown. The pulley 83 may be driven from the drive-shaft for the operating-mechanism of the hopper 4 or from the main source of power as desired.

With this latter arrangement of the machine the belt-pulley 83 operates through the gearing 77, 75 and 72 to turn the shaft 70 to rotate the cam 65. The idler pinion 75 constitutes a change-gear, for which may be substituted other gears of different size to regulate the timing of the operation of the machine. In other words, the speed of the cam may be regulated to time the reciprocation of the slide 40 carrying the magazine 35, whereby a suitable interval elapses before the shifting of the magazine to the right to provide for a dwell in the action of the magazine to allow the nails or other articles to feed thereinto. That is to say, as the cam 65 is rotated after the shifting of the magazine 35 to the right the magazine will be returned to first position and will remain at rest while the nails are feeding thereinto from the chute 5. Each time the hump or protuberance 66 on the side of the cam 65 engages with the roller 67 the slide 40 is shifted to the right where it dwells for an instant as the roller travels over the flat face 85 of the hump. During this instant of dwell the operator presents the envelope or other container to the mouth

of the spout 58 and the nails or other articles will be delivered into the container, after which the magazine is returned to first position to receive a new charge. A longer interval elapses after the return of the slide 40 to first position, during that portion of the rotation of the cam 65 when its hump 66 is out of range of the roller 67, to permit a new charge of nails to feed into the magazine 35.

In some cases the magazine 35 may be provided with two parallel channels for receiving the nails from the chute 5; the arrangement being such that when the magazine is shifted to the right to deliver one group of nails therefrom a second group will feed thereinto to be delivered when the magazine is returned to the left again.

It will be observed that the invention provides an extremely simple, compact and efficient device for the purpose specified, with its operating-mechanism having a minimum number of parts. The counting and delivering device comprises essentially only one moving element, the receiver of magazine 35, which of itself performs the several operations of counting or apportioning of the nails in groups, releasing the groups for delivery while checking further feeding of the nails from the chute, and then effecting a further feed for a new charge which is collected, segregated and delivered as before.

The adjustment of the counting means through the setting of the holdback or detent-member 30 requires merely the release of a single screw so that it can be accomplished most conveniently and expeditiously. Moreover, the machine may be adjusted for various sizes or shapes of articles by regulating the size of the raceway in the chute 5 and magazine 35 and the position of the guard-member 25, all of which is simple and easy to accomplish.

The simplicity of the mechanism makes for its efficient operation without chance of derangement or getting out of order, and its lack of complication also insures against clogging or choking of the feed. When operated under power the machine is entirely automatic, relieving the operator of all work except the presentation of the containers in position to be filled by the counting and delivering means. If desired the counting and delivering means may be arranged to operate in connection with any suitable envelope- or container-feeding means as sometimes employed.

While we have herein illustrated a preferred embodiment of the device and shown it arranged for either manual or power-drive, it is obvious that various modifications may be made in the structure and arrangement of the parts of the apparatus which would fall within the scope of the present invention. Therefore, without limiting ourselves to the exact details of construction as shown and described, we claim:

1. In a machine for delivering articles in measured quantities from a source of supply, the combination of means for feeding the articles, a magazine for receiving the articles in different quantities from the feeding-means, detent-means adapted to be adjusted in fixed position with respect to the magazine to regulate the number of articles fed thereinto, and means for shifting the magazine to release the articles from the control of the detent-means whereby they will deliver automatically from the magazine.

2. In a machine of the type specified, the combination of an inclined raceway for feeding articles from a source of supply, a magazine having an inclined channel for receiving the articles in varying number from the raceway, detent-means adapted to be adjusted in fixed position with respect to the magazine to regulate the number of articles fed from the raceway into the magazine, and means to shift the magazine to release the articles from the control of the detent-means whereby they will deliver automatically from the magazine.

3. In a machine of the type specified, the combination of a chute having a raceway for feeding articles such as nails or tacks from a source of supply, a magazine movable laterally across the end of the chute and provided with a channel adapted to register with the raceway therein, detent-means for temporarily holding the articles in the magazine, means for shifting the magazine to cause it to close the end of the raceway in the chute and to carry the articles beyond the control of the detent-means whereby they are released to deliver from the magazine.

4. In a machine of the type specified, the combination of a raceway for feeding articles such as nails or tacks from a source of supply, a magazine movable across the mouth of the raceway and adapted to receive the articles fed therefrom, detent-means adjustable in cooperative relation with respect to the magazine to regulate the number of articles fed into the magazine, and means to shift the magazine to release the articles from the control of the detent-means and to close the raceway to prevent feeding while the articles are being delivered from the magazine.

5. In a machine of the type specified, the combination of a chute having an inclined raceway for feeding articles such as nails or tacks from a source of supply, a magazine movable across the end of the chute and provided with an inclined channel registering with the raceway therein to adapt it to receive a group of articles in varying

number fed therefrom, detent-means adapted to be adjusted longitudinally of the channel in the magazine to regulate the number of articles fed from the raceway into the magazine, and means to shift the magazine to release the group of articles held by the detent-means to deliver them from the magazine.

6. In a machine of the type specified, the combination of a raceway for feeding articles from a source of supply, a slide, means for reciprocating the slide, a magazine carried by the slide and provided with a channel registering with the raceway to adapt it to receive the articles fed therefrom, and means for regulating the number of articles fed from the raceway into the magazine, said means adapted to release the articles to cause them to deliver from the magazine when the latter is displaced with respect to the raceway.

7. In a machine of the type specified, the combination of a raceway for receiving the shanks of nails held in the raceway by their heads overlapping the sides thereof, a magazine having a channel registering with the raceway to adapt it to receive the nails fed therefrom, detent-means adjustable longitudinally of the channel in the magazine to regulate the number of nails fed thereinto, and means to displace the magazine with respect to the raceway to release the nails from the detent-means while closing the mouth of the raceway to check the feed therefrom.

8. In a machine of the type specified, the combination of a chute having a raceway for feeding articles from a source of supply, a guard extending longitudinally above the raceway to hold the articles therein, a magazine shiftable across the end of the chute and provided with a channel adapted to register with the raceway to receive the articles fed therefrom, and a holdback-member adjustable on the guard and having detent-means extending across the channel in the magazine to engage the articles fed thereinto to regulate the number segregated thereby to be delivered therefrom.

In testimony whereof we affix our signatures.

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