

W. I. MACOMBER.
FEED CONTROL DEVICE.
APPLICATION FILED MAY 9, 1917.

1,275,581.

Patented Aug. 13, 1918.

3 SHEETS—SHEET 1.

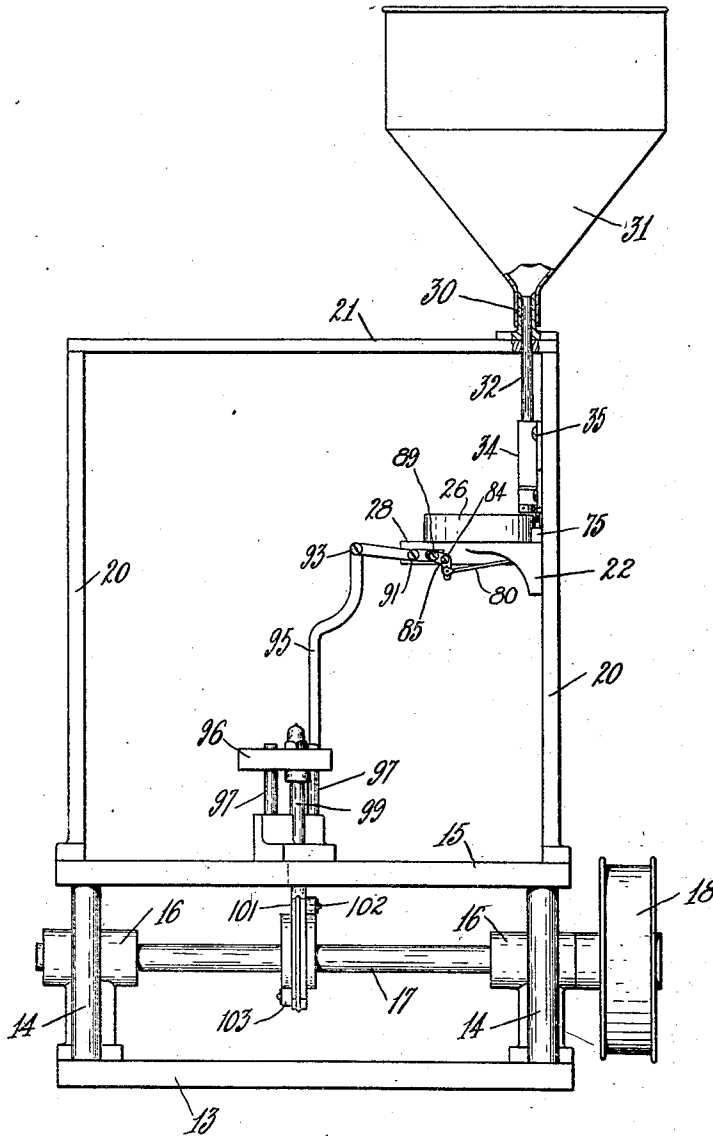


Fig. 1.

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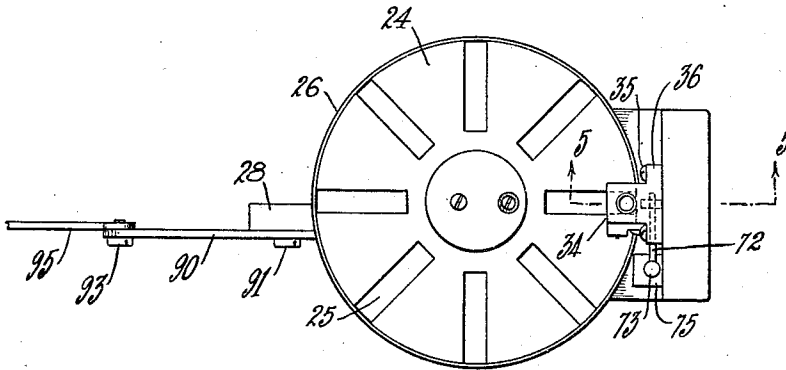


Fig. 2

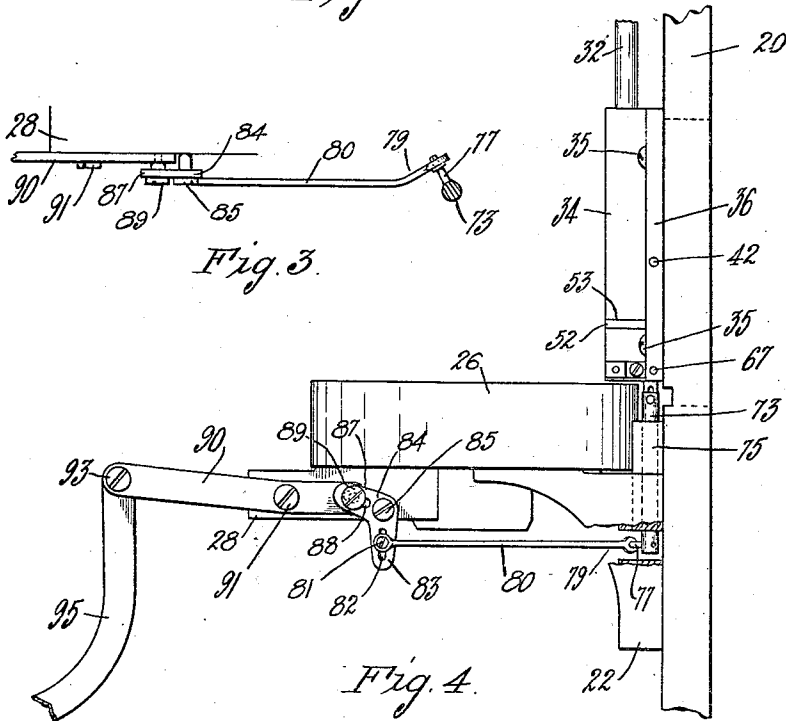


Fig. 3

Fig. 4

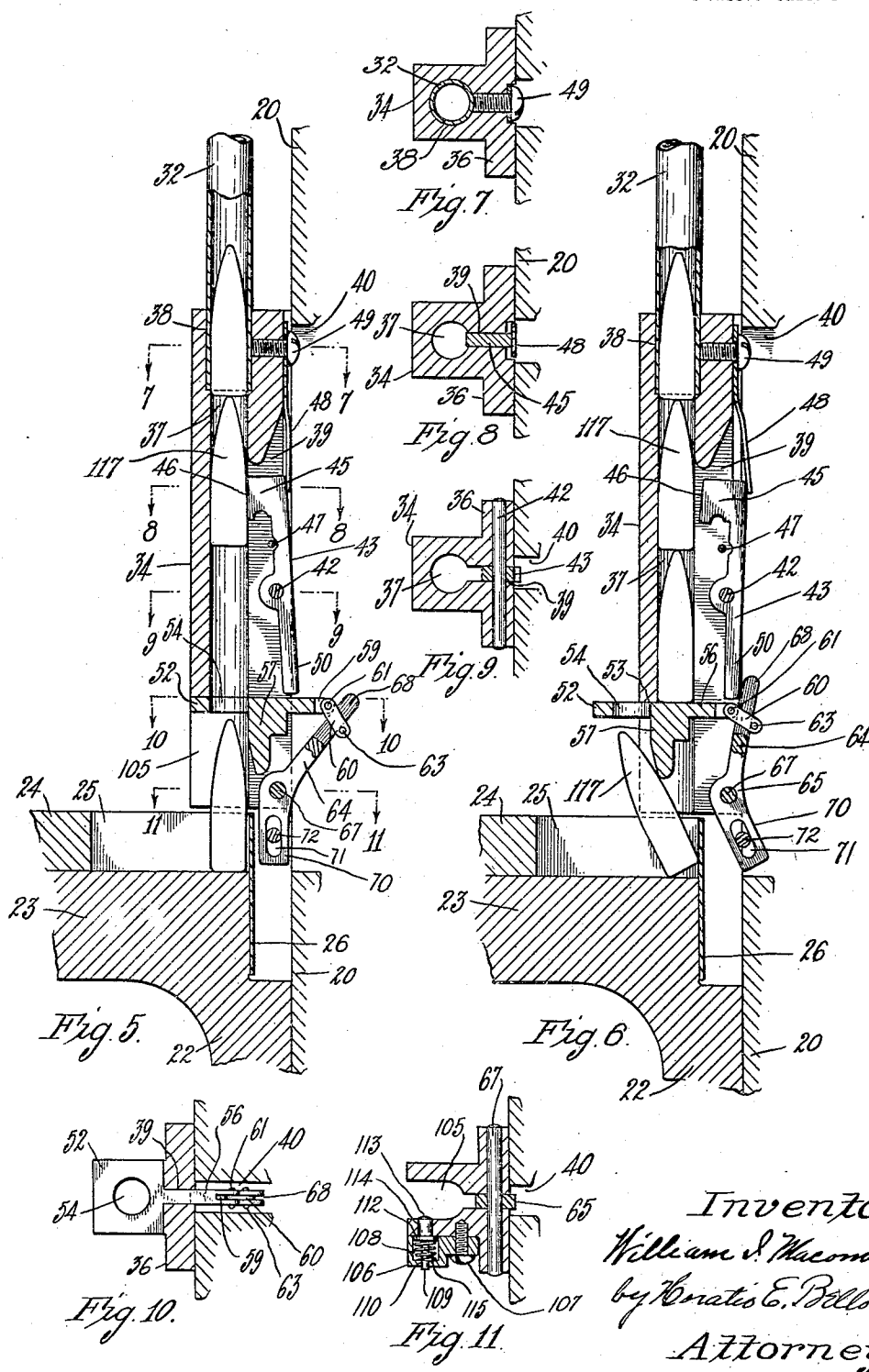
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UNITED STATES PATENT OFFICE.

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FEED-CONTROL DEVICE.

1,275,581.

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To all whom it may concern:

Be it known that I, WILLIAM I. MACOMBER, a citizen of the United States, residing at Cranston, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Feed-Control Devices, of which the following is a specification.

My invention relates to a device adapted to control the delivery of bullets, shells, or other articles through a conductor or other passage.

Articles when traveling by gravity downwardly through a cylindrical passage occasionally interlock, jam, or cramp, so as to choke the passage. The essential objects of this invention are to prevent this difficulty and facilitate the delivery of an article through and from the passage, and to attain these results by automatic means.

To the above ends essentially my invention consists in such parts and combinations of parts as fall within the scope of the appended claims.

In the accompanying drawings which form a part of this specification—

Figure 1 is a front view of a portion of the frame of a shell loading machine showing my feed control device mounted thereon in side elevation,

Fig. 2, a plan view of my device and the adjacent parts of the machine frame,

Fig. 3, a plan view of a portion of the operating lever connections,

Fig. 4, an enlarged side elevation of my device,

Figs. 5 and 6, sections on line 5—5 of Fig. 2, showing the device in positions of delivery and non-delivery respectively, and

Figs. 7, 8, 9, 10, and 11, sections on lines 7—7, 8—8, 9—9, 10—10, and 11—11 respectively of Fig. 5.

Like reference characters indicate like parts throughout the views.

For illustrative purposes my invention is herein shown and described applied to or embodied in a shell loading machine, only such parts of the machine being disclosed as suffice to indicate the relation of my device to the machine as a whole. The structure comprises the frame base 13, posts 14, table 15, bearing 16, driving shaft 17, pulley 18, end uprights 20, cross piece 21, bracket 22, conveyer base 23, intermittently rotatable conveyer 24 with slots 25, conveyer re-

taining ring 26, and lever support 28. The tubular post 30 on the cross piece is embraced by the hopper 31 and surrounds the conductor or tubular guide 32 for the bullets or shells. In conjunction with the enumerated parts of a loading machine, my device is now to be described.

A vertical block or casting 34 is attached, by screws 35 passing through flanged portions thereof 36, to one upright 20, and is provided with a cylindrical vertical bore 37 having an increased diameter 38 near its top to accommodate the lower end of the tube 32 affording a continuous passage of uniform diameter in both the tube and block. The rear portion of the block is provided with a vertical slot or opening 39 opening into the bore 37 and registering with a similarly disposed slot 40 in the upright. Through the laterally extended portions 36 of the block is a pivot pin 42 extending across the slot 39 upon which is pivotally mounted intermediate its length a vertical lever 43. The upper end of this lever has an enlarged portion or forwardly projecting head 45 of substantially rectangular form but provided preferably with an inclined forward edge or face 46. There is a transverse stop pin 47 in the block projecting into the slot 39 intermediate the lever pivot 42 and the head 45, in the path of the lever. The lever head is normally forwardly pressed against this pin by a flat spring 48 which presses against the back of the head and is fixed at one end to the block by an attaching screw 49. The inward pressure of the spring 48 upon the head 45 forces the engaging face thereof slightly into the bore 37 of the block to such an extent that any article sliding in the bore will be frictionally engaged and held by said face and spring. Means engageable with the shank 50 of the lever intermittently forces the lever head outwardly and releases the article engaged in the bore.

A reciprocating cut off plate 52 is slidable in a transversely disposed slot 53 near the bottom of the block, and is provided with a hole 54 adapted, when the plate is in rear-most position, to register with the bore 37. The plate has a rearward arm or extension 56 adapted to extend loosely through the slot 39 and into the slot 40. There is an integral projection 57 upon the lower face of the plate adjacent and extending to the rear of the hole 54. The end of the extension

sion 56 is provided with a slot or bifurcation 59 to receive the end of a link 60 pivoted at one end to a pin 61 in the bifurcated member. In the opposite end of the link is pin 63 which slidably engages the back of one arm 64 of a lever 65 pivoted upon a pin 67 in the block extending across the slot 39. The upper end of the arm 64 has a slot or bifurcation 68 to allow the passage loosely therethrough of the link 60. The lower arm 70 of the lever 65 is disposed at an angle to its other arm and has an oblong longitudinal slot 71 in which slides a lateral pin 72 in the upper end of a rod or rock shaft 73 journaled in a boss 75 on the bracket 22. A lateral pin 77 in the lower end of the shaft 73 is at an angle to the pin 72 and loosely engages the bent end 79 of a rod 80 which has a pin 81 moving in a slot 82 in arm 83 of a bell crank lever 84 pivoted upon a pin 85 in lever support 28. The second arm 87 of the bell crank lever has a slot 88 in which moves a pin 89 on the end of a lever 90 pivoted intermediate its length on a pin 91 in the support 28. The other end of lever 90 is pivoted at 93 to the upper end of a rod 95 fast to a plate or head 96 vertically slidable on guides 97 upon the table 15. Fast to the number 96 is a vertical rod 99 having on its end an open plate 101 carrying on its opposite faces cam rolls 102 and 103 carried by the shaft 17. This shaft through the described lever connections reciprocates the plate 52. The shank 50 of the lever 43 is in the path of the arm 64 of the lever 65 so that as the arm 64 advances it strikes the shank 50 and forces the lever head away from the slot. When the arm 64 retreats and frees the shank, the spring 48 returns the head back to the bore 37.

In the present instance the lower front portion of the block 34 is cut away forming a vertical opening or slot 105 communicating with the bore. In one of the side walls of block below the plane of the plate 52 is a friction device. In detail this comprises a plate 106 fixed to the exterior of the wall by a screw 107 and provided with a recess 108. A pin shank 109 slidable in a perforation 110 in the plate passes through the cavity, and has a collar 112 bearing against the exterior of the wall. A helical spring 115 in the recess 108 presses against the collar and the plate.

The articles 117 fed by my device are in this instance bullets, which travel by gravity from the hopper 31 downwardly through the tube 32 and bore 37 in contact with each other, as shown in Fig. 6, until the bottom one rests upon the unperforated portion of the plate 52. The lever head 45 then engages the next to the lowermost bullet and the plate 52 retreats, whereupon the lowermost bullet descends through the hole 54 and rests upon the conveyer base 23, the

parts assuming the position shown in Fig. 5. In this position the yielding friction pin 113 exerts some pressure upon the side of the latter bullet to prevent its accidental tilting. The return of the plate 52 brings the projection 57 against the bullet, as shown in Fig. 6, and causes it to fall into a horizontal position upon the base 23 in one of the conveyer slots 25. The conveyer 24 is rotated step by step from the shaft 17 by mechanism, not shown, to receive a bullet each time a slot 25 registers with the slot 105.

While improved results are attained by the use of a friction pin 113 it may be successfully dispensed with in some instances.

The projection 57 also is omitted when the bullet or other article is delivered to another mechanism or receptacle where it is preferred that the bullet remain upright.

I claim:—

1. In a feed mechanism, the combination with a hopper adapted to contain articles, and a guide member through which they are delivered from said hopper, means adapted to close the exit from said guide member and to support an article and movable to admit of the passage of the article through an opening in said guide member, oscillatory means loosely connected with said means, and means coöperable with a succeeding article to control said oscillatory means.

2. In a feed mechanism, the combination with a hopper adapted to contain articles, and a guide member through which they are delivered from said hopper, means adapted to close the exit from said guide member and to support an article and movable to admit of the passage of the article through an opening in said guide member, oscillatory means loosely connected with said means, and means coöperable with a succeeding article to control said oscillatory means, said means having a portion for direct contact with the discharged article to throw the same into horizontal position upon the return of the oscillatory means to support the next succeeding article.

3. In a feed mechanism, the combination of a hopper with a guide member for guiding articles therefrom, a reciprocatory cut-off plate adapted to support an article and having an opening for the passage of the article when the plate is moved, oscillatorily mounted means for moving said plate, a lever disposed longitudinally of the guide member and coöperable with the oscillatorily mounted means for engagement with an article and adapted to engage and move with the said oscillatorily mounted means.

4. In a feed mechanism, the combination of a hopper with a guide member for guiding articles therefrom, a reciprocatory cut-off plate adapted to support an article and having an opening for the passage of the

article when the plate is moved, oscillatory mounted means for moving said plate, a lever disposed longitudinally of the guide member and coöperable with the oscillatory mounted means for engagement with an article and adapted to engage and move with the said oscillatory-mounted means, said plate having a member adapted to contact with a discharged article to throw the same into a horizontal position.

5. In a feed mechanism, the combination of a hopper with a guide member for guiding articles therefrom, a reciprocatory cut-off plate adapted to support an article and having an opening for the passage of the article when the plate is moved, oscillatory mounted means for moving said plate, a lever disposed longitudinally of the guide member and coöperable with the oscillatory mounted means for engagement with an article and adapted to engage and move with the said oscillatory-mounted means, said plate having a member adapted to contact with a discharged article to throw the same into a horizontal position, and means to prevent accidental tipping of the discharged article until engaged by said tilting member.

6. In a feed mechanism, the combination of a guide member provided with a vertical

bore, a reciprocating plate slidable across the bore to alternately open and close the same in its reciprocation, a projection upon the lower face of the plate, an oscillatory lever mounted in said guide member above the plate movable to and from the bore, said projection adapted to engage and tilt a discharged article, means for moving the lever toward the bore, and means coöperating with the plate for moving the lever from the bore.

7. In a feed mechanism, the combination of a guide member provided with a vertical bore and with a vertical opening in its lower portion extending to the bore, a reciprocating plate slidably mounted in the member across the bore in the upper portion of said opening and provided with an opening adapted to register with the bore at one position of the plate, a projection upon the lower face of the plate adjacent the opening to engage and tilt a discharged article, a vibratory lever mounted in the member above the plate movable to and from the bore, means for actuating the plate, and means coöperating with the plate for vibrating the lever.

In testimony whereof I have affixed my signature.

WILLIAM I. MACOMBER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."