R. G. CLARK.

AUTOMATIC FEEDING MECHANISM.

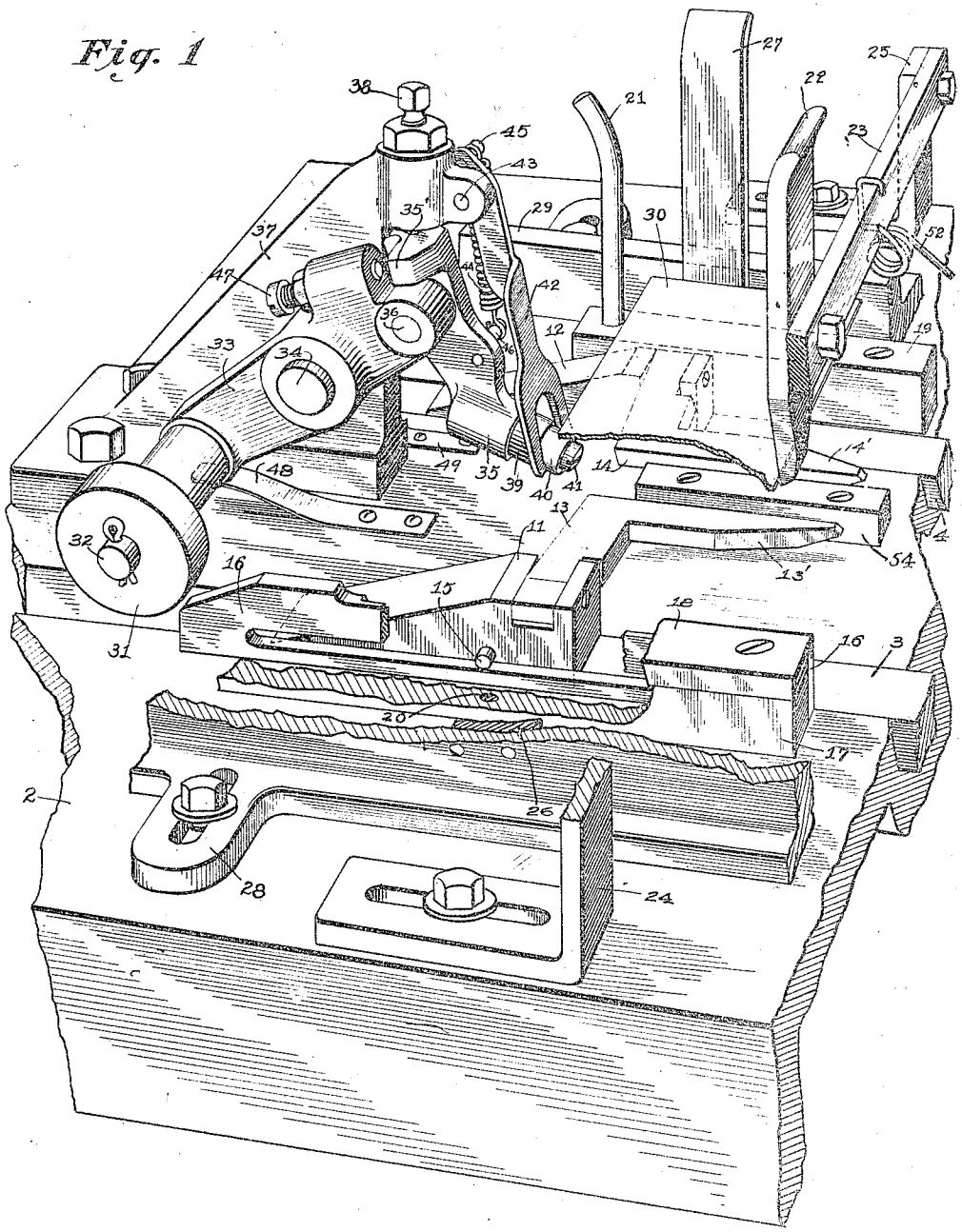
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1,169,925.

Patented Feb. 1, 1916.

5 SHEETS—SHEET 1.

Fig. 1



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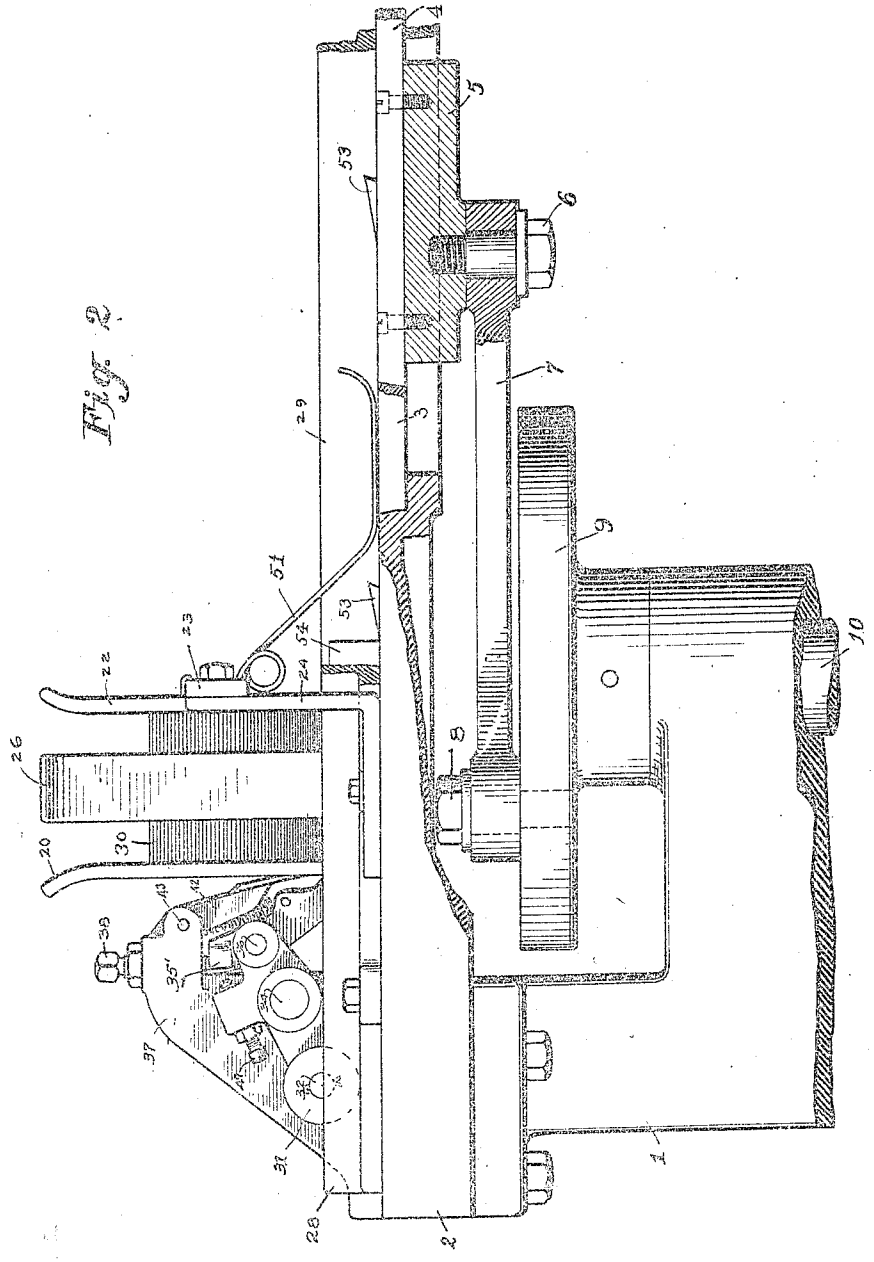
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5 SHEETS—SHEET 2.

Fig. 2.



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5 SHEETS—SHEET 3.

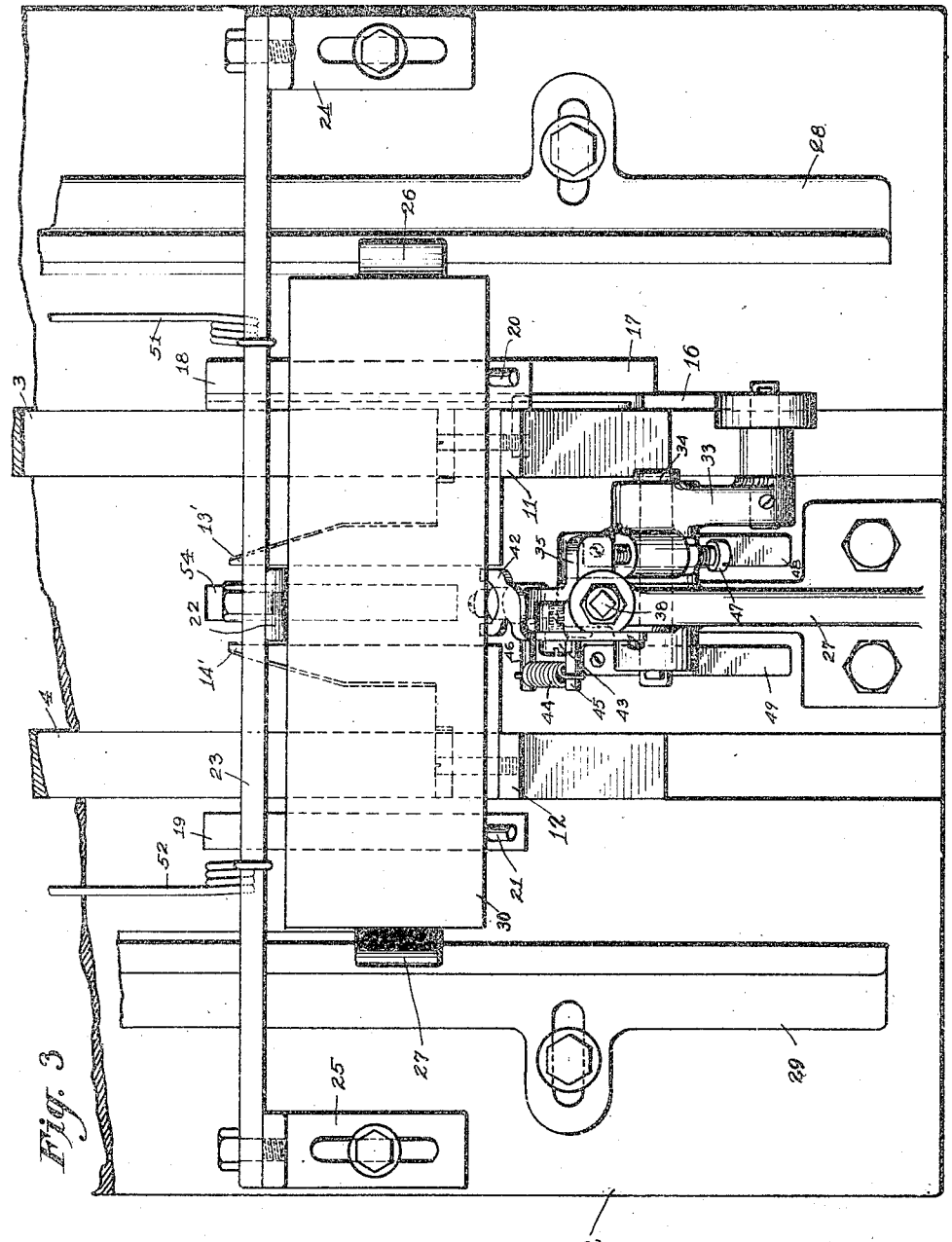


Fig. 3

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AUTOMATIC FEEDING MECHANISM.

APPLICATION FILED DEC. 9, 1913.

1,169,925.

Patented Feb. 1, 1916.

5 SHEETS—SHEET 4.

Fig. 5

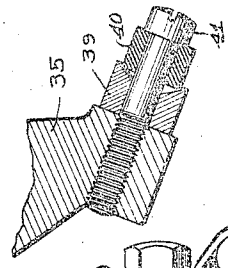


Fig. 4

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AUTOMATIC FEEDING MECHANISM.

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1,169,925.

Patented Feb. 1, 1916.

5 SHEETS—SHEET 5.

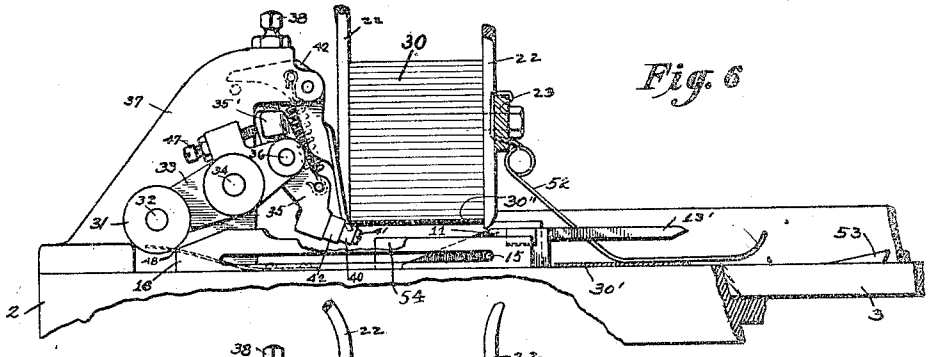


Fig. 6

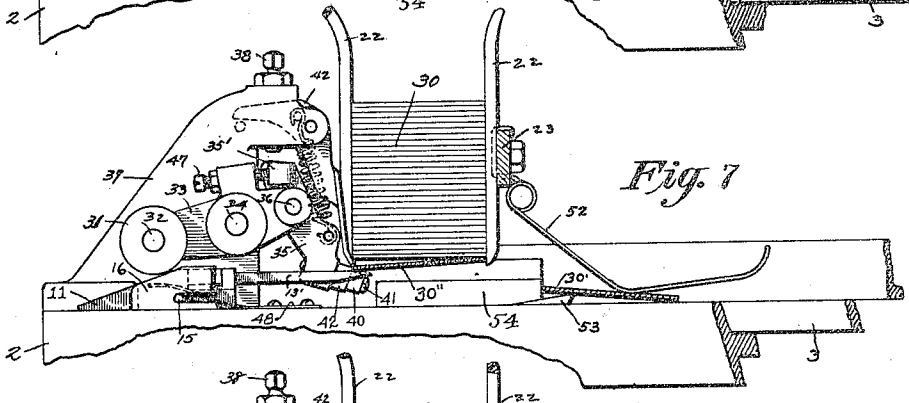


Fig. 7

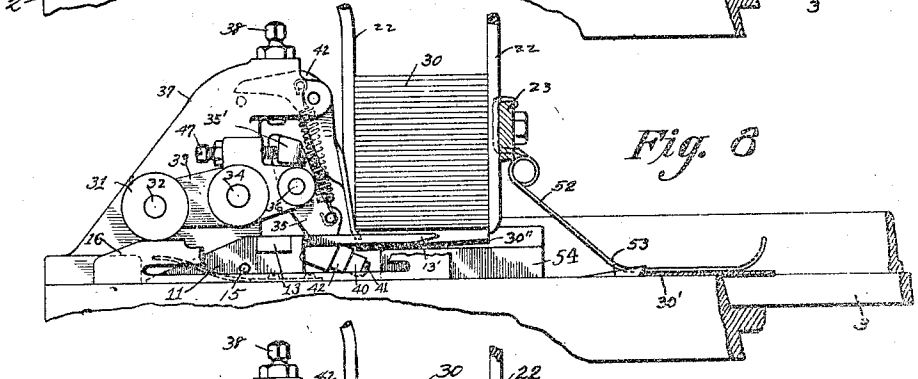


Fig. 8

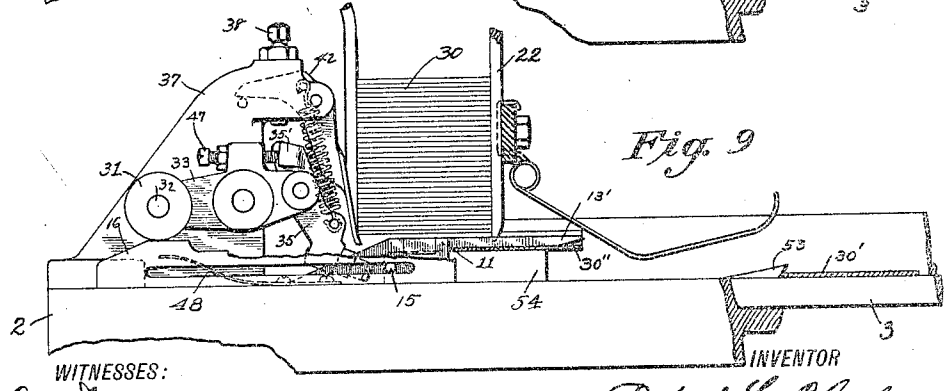


Fig. 9

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UNITED STATES PATENT OFFICE.

ROBERT G. CLARK, OF NEW YORK, N. Y.

AUTOMATIC FEEDING MECHANISM.

1,169,925. Specification of Letters Patent. Patented Feb. 1, 1916.

Application filed December 9, 1913. Serial No. 805,515.

To all whom it may concern:

Be it known that I, ROBERT G. CLARK, a citizen of the United States, and resident of the city of New York, borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Automatic Feeding Mechanism, of which the following is a specification.

This invention relates to an automatic feeding mechanism for feeding blanks to a machine for operating upon the same.

As an illustration of one of the many uses to which this invention may be put, a can body forming machine may be mentioned with which my improved feeding mechanism may be used for feeding the metal blanks to the machine which forms the same into the can bodies.

The object of the invention is to provide a simple mechanism which shall be positive in its action and capable of feeding the blanks rapidly.

In carrying out the invention I provide means for springing or buckling one edge of the blank away from the remaining blanks in the pile and then separating this blank from the pile and advancing or feeding the same to the machine.

The above and other objects and features of the invention will appear more fully hereinafter in connection with the description which follows of the feeding mechanism shown in the accompanying drawings to illustrate the same, in which I have shown and described a feeding mechanism adapted particularly for feeding metal blanks to a can body forming machine.

In the drawings like parts in the several views have been given the same reference numerals, the parts of the can body forming machine as well as the operating mechanism having been omitted, as it will be understood that the particular construction of the same is not essential to the features of this invention, which may be adapted for use in connection with various machines of this nature.

Figure 1 is a perspective view of an automatic feeding mechanism attached to a can body forming machine, partly broken away in order to show the construction and arrangement. Fig. 2 is a side view from the lower side of Fig. 1, partly in section and drawn to a somewhat smaller scale. Fig. 3 is a plan view of Fig. 2. Fig. 4 is an enlarged side view similar to Fig. 2. Fig. 5 is a fragmentary detail view, partly in section. Figs. 6 to 9 inclusive are diagrammatic views showing successive positions of the mechanism during the operation of feeding the blanks.

It will be understood that this mechanism may be arranged to be mounted upon and operated from the can body machine with which it is used. One of the end supports of the machine is shown at 1 and a portion of the table at 2. The feed bars 3 and 4 of the can body machine are attached to and operated by the cross head 5 and the cross head pin 6, by means of which the link 7, connected by the crank pin 8 to the crank disk 9 upon a crank shaft 10 (see Fig. 2), which shaft is a part of the driving mechanism of the machine, thus avoiding the necessity of providing a separate operating means for the latter.

A feed dog block 11 is mounted upon the feed bar 3 and a second feed dog block 12 is similarly mounted upon the feed bar 4. The feed dog 13 is pivotally mounted upon the feed dog block 11 and a second feed dog 14 is similarly mounted upon the feed dog block 12, as shown in Fig. 1. The feed dog 13 is provided with an extension or finger 13′ extending at right angles from the inner end thereof and the feed dog 14 is likewise provided with a similar finger 14′.

A pin 15, extending outwardly from the feed dog block 11, engages in a slot in the slide 16, which is slidably mounted in a support block 17 and cap 18, both being mounted upon the table 2 outside of the feed bar 3. A second support block 19 is also mounted upon the table 2 outside of the feed bar 4. These blocks support the blanks, as will be described more fully hereinafter.

A rear stop pin 20 is mounted in the support block and cap 17—18 and a second rear stop 21 is similarly mounted in the support block 19. A front stop 22 is mounted upon a cross bar 23 which is attached to the supports 24 and 25 mounted upon the table 2. Side stops 26 and 27 are respectively mounted upon the guides 28 and 29 on opposite sides of the blanks 30. These side guides 28 and 29 are adjustably secured to the table 2 so that the same may be moved inward or outward to accommodate blanks of different lengths.

A roller 31 is carried upon the pin 32 in position to be engaged by the slide 16, as

will be explained more fully hereinafter. The pin 32 is mounted upon one end of the lever 33, which is pivoted at 34 and has its opposite end formed to engage one end of the plunger 35 which is pivotally mounted thereupon at 36, the lever 33 and plunger 35 being carried by the bracket 37 mounted upon the table 2. A set screw 38 in the bracket 37 limits the upward travel of the plunger 35.

At the lower end of the plunger 35 is mounted a member 39 which, on account of its peculiar function and action, described more fully hereinafter, may be designated a picker and in connection with which a second member 40, which is somewhat smaller so as to form a shoulder, is mounted. The picker members 39 and 40 are attached to the plunger 35 by means of a screw 41. A stop or latch 42 is pivotally mounted at 43 upon the bracket 37, the lower end of the latch being normally held in position against the blanks by means of the spring 44 attached at its upper end to a pin 45 in the upper end of the latch and at its lower end to a pin 46 in the plunger 35, as shown in Fig. 1. An adjusting screw 47 in the lever 33 is positioned to engage a lug or projection 35′ from the plunger 35 when the lever 33 is operated. A flat spring 48 is mounted upon the table 2 and is bent upwardly at one end in a position to engage and raise the feed dog 13. A similar spring 49 is provided for raising the feed dog 14′, the purpose of which will appear hereinafter. Springs 51 and 52 may be mounted upon the cross bar 23 in position to engage the blanks as the same are fed from the pile, as shown in Figs. 6 to 9 inclusive, and feed bar dogs 53 on the feed bars 3 and 4 are arranged to advance the blanks successively through the successive operations of the machine thereupon.

When the machine is in operation the feed bars 3 and 4 are reciprocated by the crank shaft 10 and mechanism already described. Assuming the parts to stand in the position shown in Fig. 6, the feed bar 3 carrying the block 11 and pin 15, moves to the left until the pin 11 engages the end of the slot in the slide 16 and then carries the slide 16 under the roll 31, causing the same and the end 32 of the lever 33 to be raised as the inclined portion of the slide 16 passes under the roll 31, until the same rests upon the upper flat edge of the slide 16. This movement carries the opposite end of the lever 33 and the plunger 35 downwardly therewith, the upper end of the plunger 35 sliding upon the front vertical edge of the bracket 37, and causes the picker 39 to engage one edge of the lower blank 30′ and buckle the same downwardly at the center to the position shown in Fig. 7. The latch 42 then engages over the edge of the blank, by reason of the action of the spring 44, and holds the same separated from the pile of blanks while the movement of the lever 33 just described then causes the adjusting screw 47 to engage the lug 35′ on the upper end of the plunger 35, causing the picker 39 to be disengaged from the blank.

While the above operation is taking place the feeding dogs 13 and 14 have been carried back by the movement of the blocks 11 and 12 upon which they are pivotally mounted and are engaged by the springs 48 and 49 and raised into position so that as the feed bar and attached parts are then moved in the opposite direction the fingers 13′ and 14′ on the feed dogs 13 and 14, respectively, pass above the upper surface of the blank 30″ (the blank meantime being held by the latch 42) and cause the same to be separated from the pile of blanks 30 until the entire central portion thereof is buckled upon the central support 54 sufficient to clear the lower end of the front stop 22, as shown in Fig. 8. The further movement of the feed bar 3 to the right causes the blank 30″ to be advanced by the feed dogs 13 and 14 until the same drops off from the end of the supports 18 and 19 upon the feed bars 3 and 4, passing under the holding springs 51 and 52, from which position it is advanced by the feed bar dogs 53 to the machine in the usual manner. (Fig. 9.)

While the feed bar 3 and attached parts are moving to the right and performing the operation just described, the slide 16 remains stationary, holding the lever 33 and the plunger 35 until the pin 15 engages the opposite end of the slot in the slide 16. As soon as this occurs the slide 16 is moved to the right, causing the lever 33 and the plunger 35 to be returned to their former positions, when the operation just described is repeated and the next succeeding blank is fed in the same manner. The picker 39—40 carried by the plunger 35 may be of any suitable construction adapted to engage the edge of the blank and buckle the same downwardly in the manner described. A simple construction which possesses some advantages consists in attaching two hardened steel rolls, one slightly smaller in diameter than the other to the plunger 35. These rolls are shown in detail in Fig. 5, from which it will be noted that roll 39 is under-cut or concaved on one side which enables the same to more readily and positively engage or pick the blank from the pile. A further advantage of this construction is that as one portion of the roll becomes worn the same may be turned slightly to present a new operating face, or the same may be readily replaced.

It will be noted that the operation of the feeding mechanism just described presents several peculiar features, among which may

be mentioned the buckling of one edge of the blank away from the pile, the separation and buckling downwardly of the central portion of the blank, freeing the same from the stop, and sliding the blank from under the pile into position to be engaged by the feed bars, as well as other features of construction, such as the arrangement of the spring between the plunger and latch, which enables a single spring to operate both of these members, and the arrangement of the latch which operates to hold the edge of the blank after being buckled downwardly by the picker and released. It will be understood that this feeding mechanism may be adapted for use with practically any type of machine in which it is desired to feed blanks successively thereto.

As many changes could be made in the above construction and many apparently widely different embodiments of my invention designed without departing from the scope thereof as defined in the appended claims, it is intended that all matter herein contained or described or shown in the accompanying drawings shall be interpreted as illustrative merely of an operative embodiment of my invention and not in a limiting sense.

What I claim is:—

1. Feeding mechanism for blanks, comprising, in combination, means for engaging and buckling one edge of the blank away from the adjacent blanks in the pile, said means operating transversely to the plane of the blank, means for separating the opposite edge of said blank from the pile, and means for advancing the blank.

2. Feeding mechanism for blanks, comprising, in combination, means for engaging and buckling one edge of the blank away from the adjacent blanks in the pile, said means operating transversely to the plane of the blank, means for separating the opposite edge of said blank from the pile, and means for advancing the blank, said several means operating successively and automatically upon each of the successive blanks in the pile.

3. Feeding mechanism for blanks, comprising, in combination, means for buckling one edge of the blank away from the adjacent blanks in the pile, means for holding the edge of blank after buckling, means for separating said blank from the pile, and means for advancing the blank.

4. Feeding mechanism for blanks, comprising, in combination, means for engaging and buckling the central portion of one edge of the blank away from the adjacent blanks in the pile, said means operating transversely to the plane of the blank, means for separating the opposite edge of said blank from the pile, and means for advancing the blank.

5. Feeding mechanism for blanks, comprising, in combination, means for engaging and buckling one edge of the bottom blank away from the adjacent blanks in the pile, said means operating transversely to the plane of the blank, means for separating the opposite edge of said blank from the pile, and means for advancing the blank.

6. Feeding mechanism for blanks, comprising, in combination, means for engaging and buckling one edge of the bottom blank away from the adjacent blanks in the pile, said means operating transversely to the plane of the blank, means for separating the opposite edge of said blank from the pile, and means for sliding said blank transversely from under the pile.

7. Feeding mechanism for blanks, comprising, in combination, a plunger having a portion adapted to engage one edge of a blank, means for moving said plunger transversely to the plane of the blank causing one edge of the blank to be buckled away from the adjacent blanks in the pile, means for separating said blank from the pile, and means for advancing the blank.

8. Feeding mechanism for blanks, comprising, in combination, a pivotally mounted plunger having a portion adapted to engage one edge of a blank, means for moving said plunger transversely to the plane of the blank causing one edge of the blank to be buckled away from the adjacent blanks in the pile, means for separating said blank from the pile, and means for advancing the blank.

9. Feeding mechanism for blanks, comprising, in combination, a pivotally mounted plunger having a portion adapted to engage and buckle one edge of a blank, a latch adapted for holding the edge of the blank after buckling, a spring operatively connected to said plunger and latch, means for moving said plunger transversely to the plane of the blank causing one edge of the blank to be buckled away from the adjacent blanks in the pile, means for separating said blank from the pile, and means for advancing the blank.

10. Feeding mechanism for blanks, comprising, in combination, a plunger having a portion adapted to engage one edge of a blank, a lever upon which said plunger is mounted, means for operating said lever to move said plunger transversely to the plane of the blank causing one edge of the blank to be buckled away from the adjacent blanks in the pile, means for separating said blank from the pile, and means for advancing the blank.

11. Feeding mechanism for blanks, comprising, in combination, a plunger having a portion adapted to engage one edge of a blank, a lever upon which said plunger is mounted, a slide arranged to engage and operate said lever and to move said plunger

transversely to the plane of the blank causing one edge of the blank to be buckled away from the adjacent blanks in the pile, means for separating said blank from the pile, and means for advancing the blank.

12. Feed mechanism for blanks, comprising, in combination, a plunger having a portion adapted to engage one edge of a blank, a lever upon which said plunger is mounted, a guide for said plunger, means for operating said lever and plunger in conjunction with said guide to move said plunger transversely to the plane of the blank causing one edge of the blank to be buckled away from the adjacent blanks in the pile, means for separating said blank from the pile, and means for advancing the blank.

13. Feeding mechanism for blanks, comprising, in combination, a plunger having a portion adapted to engage one edge of a blank, a lever upon which said plunger is pivotally mounted, means for operating said lever and plunger to cause the plunger to engage and buckle one edge of a blank away from the adjacent blanks in a pile, means for releasing said plunger from the blank, means for separating the blank from the pile, and means for advancing the blank.

14. Feeding mechanism for blanks, comprising, in combination, a plunger having a portion adapted to engage one edge of a blank, a lever upon which said plunger is pivotally mounted, means for operating said lever and plunger to cause the plunger to engage and buckle one edge of a blank away from the adjacent blanks in a pile, means carried by said lever adapted to engage and release said plunger from the blank, means for separating the blank from the pile, and means for advancing the blank.

15. Feeding mechanism for blanks, comprising, in combination, a plunger having a portion adapted to engage one edge of a blank, a lever upon which said plunger is pivotally mounted, a slide adapted to operate said lever, means for imparting a reciprocating movement to said slide, whereby said plunger is caused to engage and buckle one edge of a blank away from the adjacent blanks in a pile, means for releasing said plunger from the blank, means for separating the blank from the pile, and means for advancing the blank.

16. Feeding mechanism for blanks, comprising, in combination, a plunger having a portion adapted to engage one edge of a blank, a lever upon which said plunger is pivotally mounted, a slide adapted to operate said lever, means for imparting an intermittent reciprocating movement to said slide, whereby said plunger is caused to engage and buckle one edge of a blank away from the adjacent blanks in a pile, means for releasing said plunger from the blank, means for separating the blank from the pile, and means for advancing the blank.

17. Feeding mechanism for blanks, comprising, in combination, a plunger having a portion adapted to engage one edge of a blank, a lever upon which said plunger is pivotally mounted, a slide adapted to operate said lever, said slide being provided with a slot, a movable member adapted to engage in said slot whereby an intermittent reciprocating movement is imparted thereto and said plunger is caused to engage and buckle one edge of a blank away from the adjacent blanks in a pile, means for releasing said plunger from the blank, means for separating the blank from the pile, and means for advancing the blank.

18. Feeding mechanism for blanks, comprising, in combination, means for buckling one edge of a blank away from the adjacent blanks in the pile, feed dogs adapted to engage above said buckled edge and separate the blank from the pile and to advance the same, resilient members positioned in the path of said feed dogs adapted to raise the same to their operative position upon the return movement, and means for imparting a reciprocating movement to said feed dogs.

Signed at the city, county and State of New York, this 3d day of December, 1913.

ROBERT G. CLARK.

Witnesses:

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HENRY S. BARTON.