Oct. 28, 1930. R. L. WILCOX 1,779,866

FEED MECHANISM

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Fig. 1.

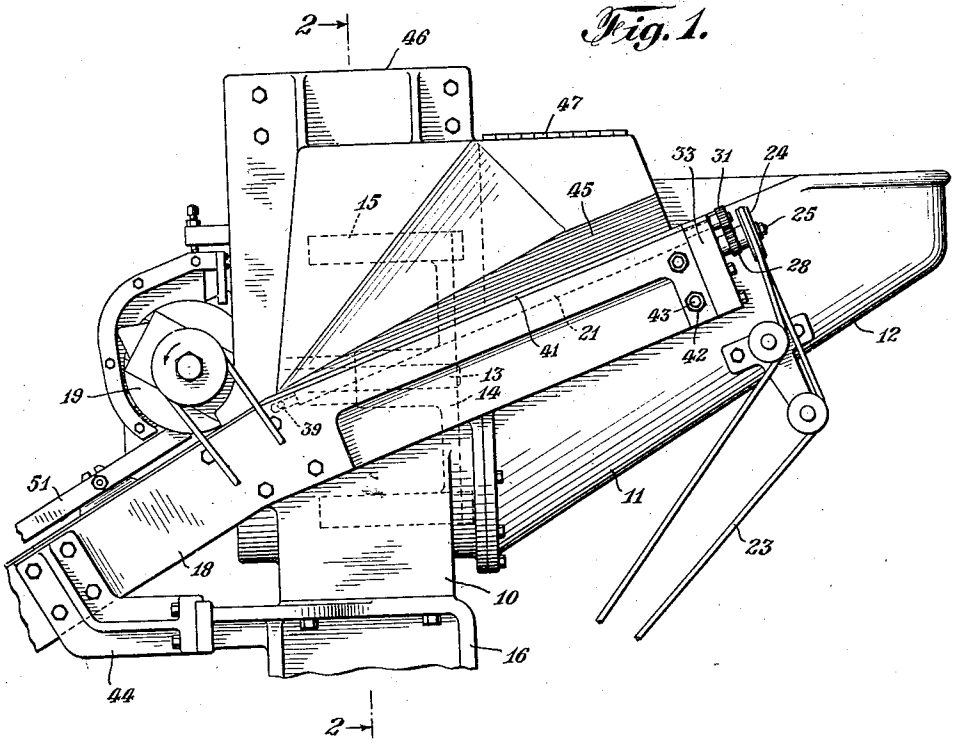
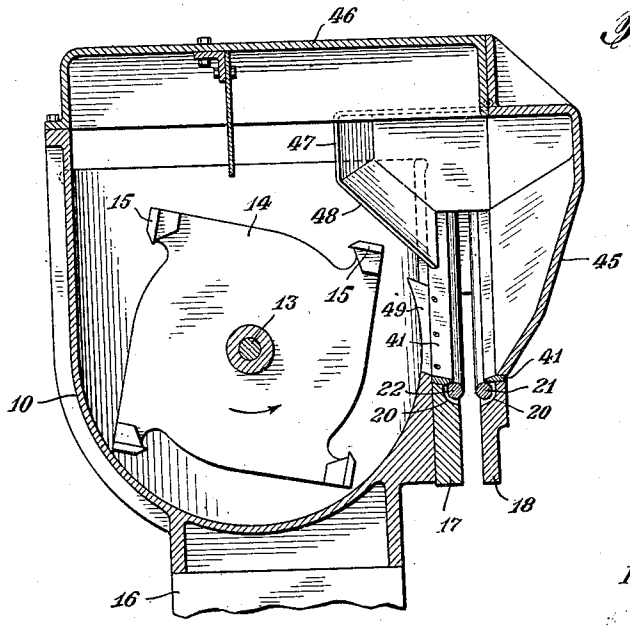


Fig. 2.



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Fig. 3.

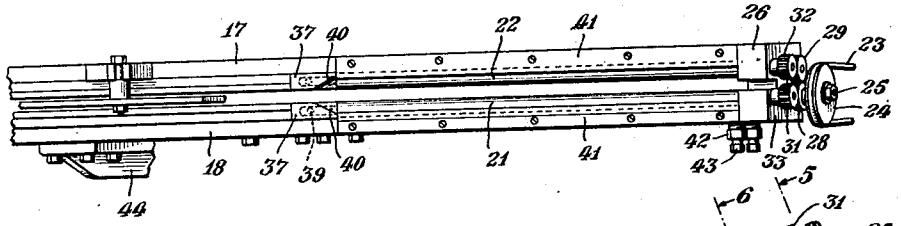


Fig. 4.

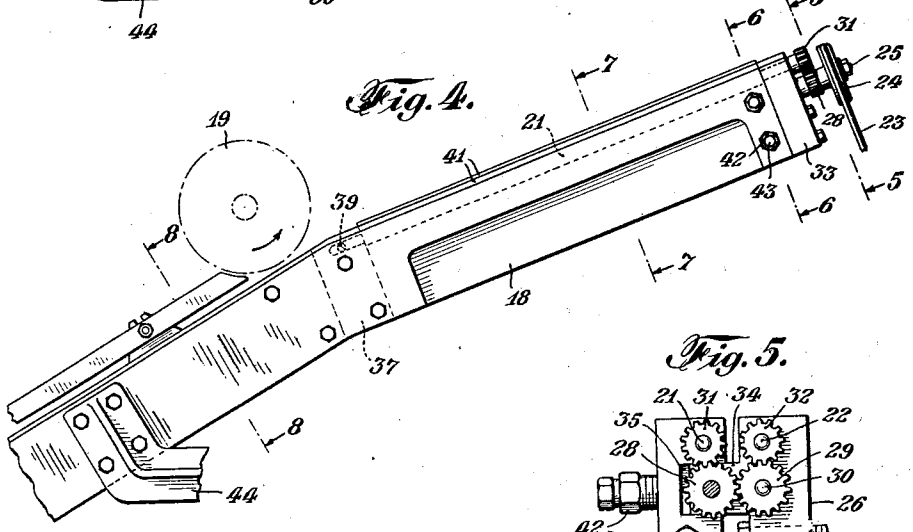


Fig. 5.

Fig. 6.

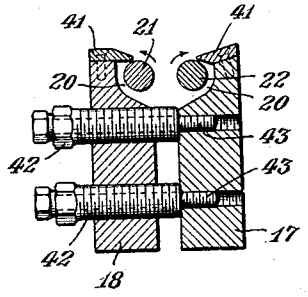


Fig. 7.

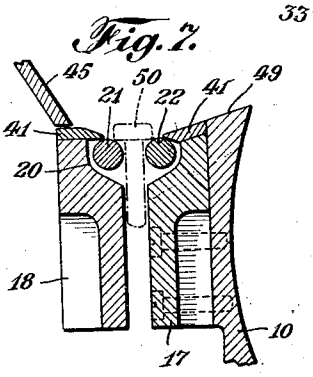
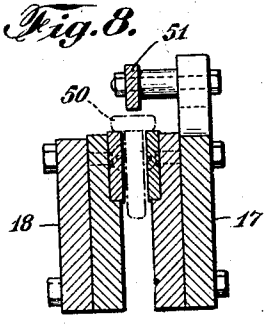


Fig. 8.



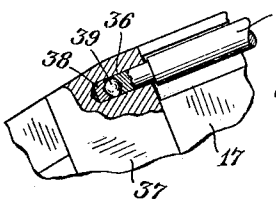


Fig. 9.

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Patented Oct. 28, 1930

1,779,866

UNITED STATES PATENT OFFICE

RICHARD LESTER WILCOX, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE WATERBURY FARREL FOUNDRY AND MACHINE COMPANY, OF WATERBURY, CONNECTICUT, A CORPORATION OF CONNECTICUT

FEED MECHANISM

Application filed January 24, 1929. Serial No. 334,703.

This invention relates to feed mechanism, particularly of the type used for taking blanks from a hopper or the like and conducting them to a distribution station, having for its object, among other things, to provide a feed mechanism of this character that will take the maximum number of articles from an indiscriminate mass of blanks, and arrange them in proper alignment with each other in the minimum time.

To these, and other ends, my invention consists in the feed mechanism, having certain details of construction and combinations of parts, as will be hereinafter described and more particularly pointed out in the claims.

Referring to the drawings, in which like numerals of reference indicate like parts in the several figures:

Figure 1 is a side elevation of my improved mechanism associated with a hopper device;

Figure 2 is a transverse sectional view thereof, taken upon line 2—2 of Figure 1;

Figure 3 is a fragmentary plan view of the chute mechanism;

Figure 4 is a side elevation thereof;

Figure 5 is an end view;

Figure 6 is an enlarged cross sectional view, taken upon line 6—6 of Figure 4;

Figure 7 is an enlarged cross sectional view, taken upon line 7—7 of Figure 4;

Figure 8 is an enlarged cross sectional view, taken upon line 8—8 of Figure 4; and

Figure 9 is a fragmentary detail view showing the lower end of the chute rolls and adjacent parts.

In the drawings I have illustrated a form of hopper mechanism that is adapted for association with my new and improved feed mechanism, wherein 10 indicates the hopper which is supported upon the standard 16, and having an inclined wall 45; 11 a trough with an inclined bottom 12 leading thereto; 13 a shaft rotatable therein; 14 a rotor head fixed thereon and carrying the lifter arms 15; and 46 a cover forming a closure for the hopper.

In the embodiment of my invention, as disclosed herein, there are provided two chute plates, respectively designated 17 and 18, the former being known as the inside plate and the latter as the outside plate, and supported in part by a bracket 44 connected with the standard 16. Both plates are designed with one portion at an angle to the other portion, whereby, when they are positioned, the lower portion is at an angle found in practice to be desirable for this type of mechanism, which is usually about 30°, while the upper portion is at a different angle, determined by experiment as desirable at about 20°. Both of these angles, of course, may be varied, but it is preferable, however, that the angle near the upper end should be less than that at the lower end.

Associated with the hopper mechanism is a clearance mechanism 19 which prevents all misaligned blanks from passing thereby.

Any form of clearance mechanism may be used with my invention and is preferably so mounted that it operates at a point adjacent to that portion of the chute plates where the two angular portions join.

The inner upper faces of the chute plates 17 and 18 are provided with recesses 20, in which are rotatably mounted the chute rolls 21 and 22, which are arranged so that they lie parallel with each other and present in the chute revolving parts, heretofore occupied by rigid corners of the chute plates. These chute rolls are rotated by a belt 23 in engagement with a sheave wheel 24 rotatable upon a stud 25 fixed in the end block 26 which is secured to the hopper mechanism or adjacent parts by bolts 27. Preferably integral with the sheave wheel 24 is a gear 28, the teeth of which mesh into those of a gear 29 rotatable upon a stud 30 in the end block 26, and the teeth of both of these pinions mesh respectively into the pinions 31 and 32 upon the ends of the chute rolls 21 and 22. The upper end of the roll 21 is journaled in the roll block 33 fixed on the end of the chute plate 18 and movable therewith.

The alignment of the blocks 26 and 33 is maintained by means of the offset portion 34 on the latter that projects into a recess 35 in the block 26. Thus, as the sheave wheel and the gears 28 and 29 rotate, the chute rolls also rotate in the direction indicated by arrows in Figure 6.

The lower ends of the chute rolls are reduced in diameter and project into and are journaled in a recess 36 in the filler plate 37, which recess contains a button 38 between which and the end of the chute roll is a ball 39, which takes the end thrust upon the chute roll and facilitates the motion thereof.

Each filler plate 37 has a rounded shoulder 40 which forms a guide for the blanks after they leave the chute rolls, and as they enter the stationary portion of the chute. Fixed to each chute plate and projecting over the recesses 20 therein are the liners 41. These liners are so shaped and set at such an angle that the blanks which fall thereon are guided toward the chute rolls and their inner ends terminate at a point so close to the periphery of the chute roll as to prevent a blank or article being carried therearound. The chute plates are moved toward and away from each other so as to accommodate blanks of different diameters and by any of the common means well known in the art. That end of the chute plates, however, adjacent to the gears and pinions is adjusted by means of the sleeves 42, which are threaded into the chute plate 18 and through which project the screws 43 which are threaded into the chute plate 17. As the ends of the sleeves 42 engage the inner wall of the chute plate 17, the open space between the chute plates is variable and in their adjusted positions the plates are then locked by means of the screws 43.

The movement of the plates toward and away from each other does not affect the operation of the gears and pinions at the upper end of the chute as the axes of the gears 28 and 29 do not vary and in the extreme positions of the pinions 31 and 32 the teeth thereon are always in mesh with those of the driving gears with which they are associated.

Hinged to the hopper, or other convenient part is a guard 47, having an inclined wall 48, which projects downwardly and inwardly toward the top of the chute plates, and terminating adjacent to the rotor head, as shown in Figure 2. Thus, a blank that may be pushed backwardly by a blow from the clearance mechanism will either strike the back end of the guard or the hopper and fall back onto the chute, or, if it is deflected either to one side or the other, it is correspondingly returned by reason of the inclination of the walls 45 and 48. Hence, practically all blanks that are engaged by the clearance mechanism by reason of their misalignment in the column are returned to the chute mechanism without falling back into the hopper to be again lifted by the rotor head and associated parts. The blanks or articles are lifted from the hopper in a well known manner and drop from the arms 15 thereon onto the inclined shoulder 49 upon one of the hopper walls, and thence slide over a liner 41 onto the chute rolls and assume the correct position therebetween, shown by the article 50 illustrated in Figure 7.

If a blank does not fall in this correct position, but crosswise thereof, it is carried downwardly by reason of its contact with the rotary chute rolls and is presented to the clearance mechanism. This mechanism strips it from the column as a misaligned blank in a manner well known in the art. The properly aligned blanks pass under the clearance mechanism and slide down the chute plates under the top plate 51 to the delivery point.

By use of the chute rolls, as herein disclosed, the angle of inclination of the chute plate inside the hopper or in front of the clearance mechanism is very much reduced. This is advantageous, because the blanks are more readily handled from the rotor head and are less liable to clog at the clearance wheel. The blanks glide or slide far more readily toward the clearance wheel with the use of the chute rolls, which also facilitate their alignment. The blanks do not become clogged or lodged in the chute particularly as the direction of the rotation of the rolls is away from each other, as indicated in Figure 6.

There are no stationary parts associated with the chute to permit the blanks to either become sluggish or inactive in their movement, and thus their speed of travel is facilitated, which also has a tendency to rectify the alignment of the blanks.

With the old type of chute mechanism, the chute plates extended into the hopper at the same angle as that portion outside, so that the blanks, whether aligned or misaligned on the chute, traveled quite rapidly toward the clearance mechanism, causing the misaligned blanks to clog and jam at that point. Thus, excess labor was placed on the clearance mechanism, sometimes more than it could conveniently take care of, with a resultant slowing up by the stream of blanks at the delivery station.

Practice has demonstrated that with my improved type of feed mechanism the speed of the feed can be increased at least 50% and long blanks can be fed at the same speed as short blanks, a result impossible of attainment under the old practice.

Within the scope of the appended claims there are minor changes and alterations that may be made within my invention, aside from those herein suggested, and I would therefore have it understood that I do not limit myself to the exact construction herein shown and described.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In mechanism of the character described, a chute mechanism comprising in part chute plates, each of which is provided with a re-

cess; and a roll rotatable within said recess to form a support for blanks positioned thereon and to facilitate movement thereof along the chute plates.

2. In mechanism of the character described, the combination with a hopper; of a chute mechanism leading therefrom, comprising in part chute plates, each of which is provided with a recess; a roll rotatable within said recess to form a support for the blanks from the hopper and to facilitate movement thereof along the chute plates; and liners fixed so as to guide articles onto the rolls and prevent the same from clogging or passing therearound.

3. In mechanism of the character described, the combination with a hopper; of a chute mechanism leading therefrom, comprising in part chute plates each of which is provided with a recess; a rotary member associated with each of the chute plates and rotatable in the recess therein adjacent to the hopper to receive the articles therefrom; and means having inclined walls to direct the travel of an article onto the chute mechanism if the same is above the top thereof, the angle of inclination of the walls causing any article brought into contact therewith to travel toward the chute plates and rotary members.

4. In mechanism of the character described; chute mechanism, comprising in part chute plates; means for adjusting the relative position of the chute plates toward and away from each other; a movable member associated with each plate and in such relation to the movable member in the other plate that the said movable members form a support for articles in the chute mechanism; and gear means for positively actuating said movable members irrespective of the relation of the chute plates and comprising companion gears associated with one of the plates and a pinion associated with each of the movable members, the teeth of the pinion associated with one of the movable members meshing into the teeth of one of the first mentioned gears and the teeth on the pinion of the other movable member meshing with the teeth of those of the other movable member.

5. In chute mechanism, the combination with chute plates, one plate having a lug thereon that projects into the recess in the other plate whereby the alignment of one plate relative to the other is maintained in any of its adjusted positions; a movable member associated with each plate forming a support for articles between the chute plates; and companion gears, one of which is rotatably mounted upon the lug and the other in the chute whereby the movable members are actuated.

6. In mechanism of the character described; a chute mechanism, comprising in part chute plates spaced relatively to each other, the inner upper corner of each of the plates being provided with a recess; and a roll rotatable in said recess to form a support for blanks positioned thereon and to facilitate movement thereof along the chute plates.

7. In mechanism of the character described; a chute mechanism, comprising in part chute plates spaced relatively to each other, the inner upper corner of each of the plates being provided with a recess; a roll rotatable in said recess to form a support for blanks positioned thereon and to facilitate movement thereof along the chute plates; and a liner on each chute plate that projects over the said recess therein and terminates adjacent to the periphery of the roll.

8. In mechanism of the character described; a chute mechanism, comprising in part chute plates spaced relatively to each other, the inner upper corner of each of the plates being provided with a recess; a roll rotatable in said recess to form a support for blanks positioned thereon and to facilitate movement thereof along the chute plates; and a liner on each chute plate that projects over the said recess therein and terminates adjacent to the periphery of the roll and shaped and set at such an angle that blanks which fall thereon are guided thereby toward the rolls.

9. In mechanism of the character described; a chute mechanism comprising in part chute plates spaced relatively to each other, the inner upper corner of each of the plates being provided with a recess; and a roll rotatable in said recess to form a support for blanks positioned thereon and to facilitate movement thereof along the chute plates, said rolls being so positioned relative to the inside faces of the chute plates that the shank of a blank between the rolls will project into the open space between the plates.

10. In mechanism of the character described; a chute mechanism, comprising in part chute plates having plural angles of inclination; a roll associated with each of the chute plates that support and facilitate the movement of blanks in the chute mechanism, said chute rolls being connected with that portion of the chute plates having the least angle relative to the horizontal; and means having rounded shoulders for guiding the blanks from the rolls into the stationary part of the chute mechanism.

11. In mechanism of the character described; a chute mechanism, comprising in part chute plates having plural angles of inclination; a roll associated with each of the chute plates that support and facilitate the movement of blanks in the chute mechanism, said chute rolls being connected with that portion of the chute plates having the least angle relative to the horizontal; and a filler plate connected with each chute plate and provided with a rounded shoulder adjacent

to the ends of the said rolls to guide blanks from the rolls.

12. In mechanism of the character described; a chute mechanism, comprising in part chute plates having plural angles of inclination; a roll associated with each of the chute plates that support and facilitate the movement of blanks in the chute mechanism, said chute rolls being connected with that portion of the chute plates having the least angle relative to the horizontal; and a filler plate connected with each chute plate, the said rolls being journaled at one end in said filler plates.

13. In mechanism of the character described; a chute mechanism, comprising in part chute plates; means for adjusting the relative position of the chute plates toward and away from each other; a roll associated with each of such plates and in such relation with each other as to form a support for articles in the chute mechanism; gear means connecting the rolls, whereby movement may be imparted thereto irrespective of the relation of the chute plates; and a guard adjacent to the chute plates but spaced from the gears, to limit the movement of an article projected over the chute mechanism.

In testimony whereof, I have hereunto affixed my signature.

RICHARD LESTER WILCOX.