Sept. 21, 1926. 1,600,238

P. H. McCAIN

ATTACHMENT FOR FEEDING DEVICES

Filed June 13, 1923 2 Sheets-Sheet 1

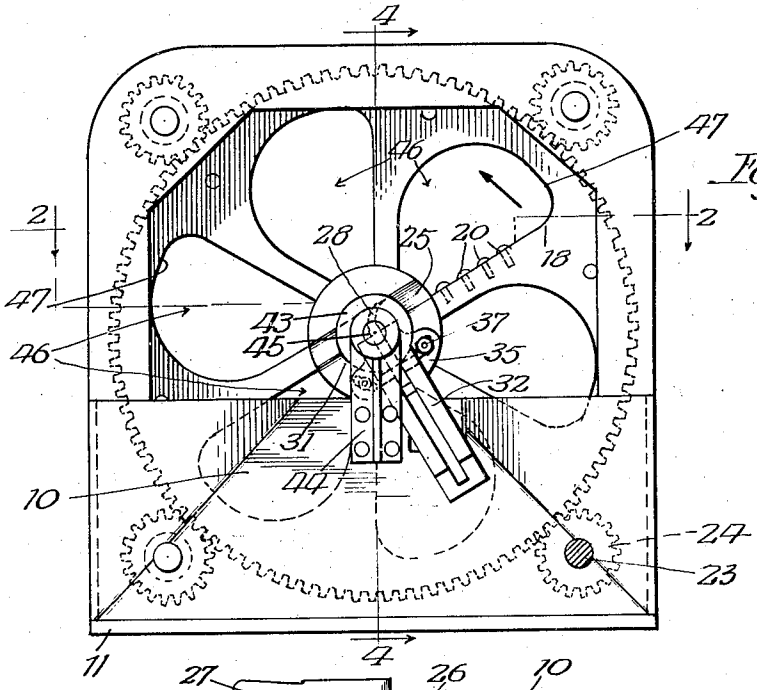


Fig. 1

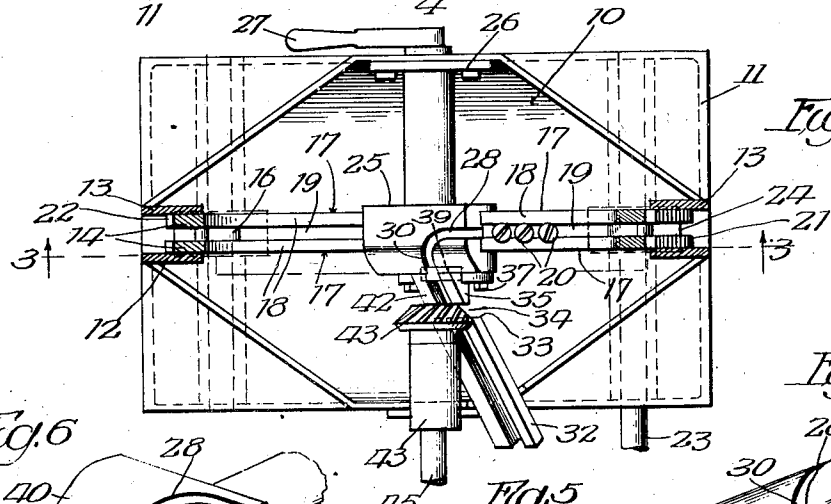


Fig. 2

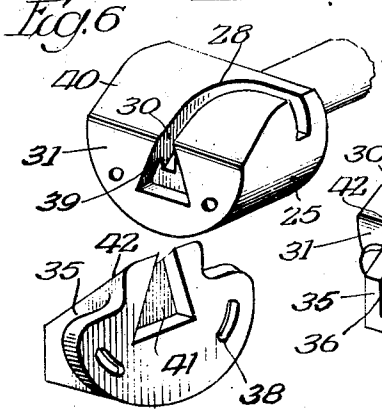


Fig. 6

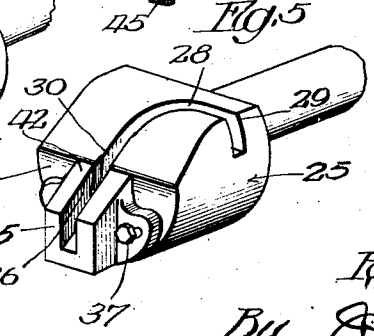


Fig. 5

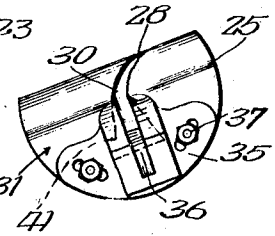


Fig. 7

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Fig. 3

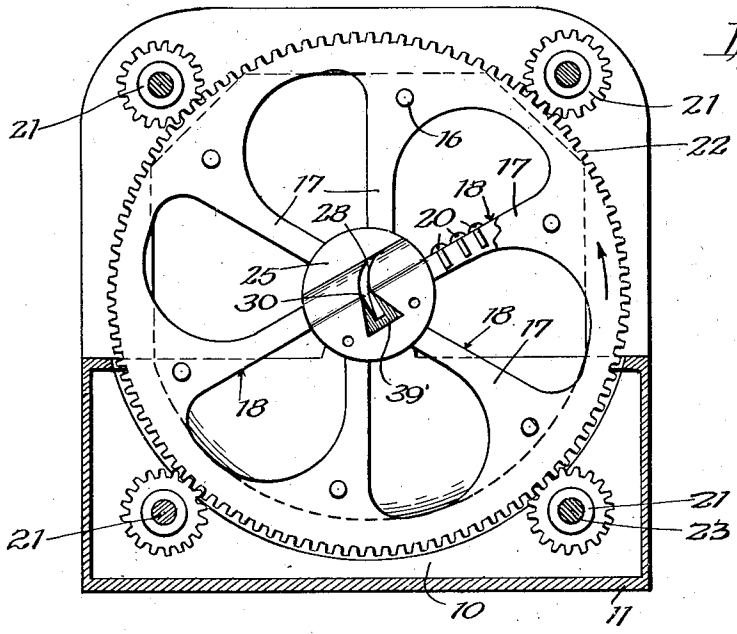
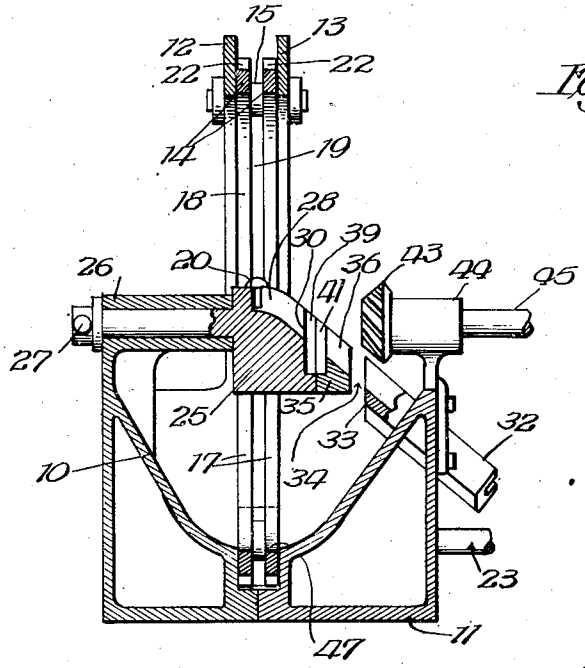


Fig. 4



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Patented Sept. 21, 1926. 1,600,238

UNITED STATES PATENT OFFICE.

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ATTACHMENT FOR FEEDING DEVICES.

Application filed June 13, 1923. Serial No. 645,049.

This invention relates to improvements in an attachment particularly adapted though not necessarily limited in its use with feeding devices for screws or bolt making machines and one of the objects of the invention is to provide an improved structure of this character which will substantially continuously and rapidly supply the articles to the feeding device and at the same time present the articles in a proper position thereto.

A further object is to provide an improved device of this character embodying a hopper for containing the articles to be operated upon and a rotatable element operating in the hopper and having a constant direction of motion, the said element being provided with a plurality of radially arranged pick up arms or portions which are arranged to discharge the articles to a delivery chute, the inlet of the latter being disposed adjacent the axis of rotation of the said element, the delivery chute being provided with a gap or space across which the articles will jump during their passage through the delivery chute, thereby providing a space through which an excess supply of articles will fall through and back into the hopper when the delivery chute is full.

A further object is to provide improved means located adjacent the gap for discharging or dislodging any article which may be presented thereto in an improper position or in the event that an article presented to the delivery chute is too large to enter the chute.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention, and in which

Figure 1 is a side elevation of a device of this character constructed in accordance with the principles of this invention.

Figure 2 is a horizontal sectional view taken on line 2—2, Figure 1.

Figure 3 is a vertical sectional view as taken on line 3—3, Figure 2.

Figure 4 is a vertical sectional view taken on line 4—4, Figure 1.

Figure 5 is a detail perspective view of the controlling device for the discharge of the articles from the pick up arms.

Figure 6 is a detail perspective view of the parts shown in Figure 5 and showing the same separated.

Figure 7 is a front elevation of the parts shown in Figure 5, showing the same in a different position.

Referring more particularly to the drawings the numeral 10 designates generally a hopper of any desired size and configuration and is supported upon a suitable base 11. Projecting above the hopper are spaced uprights 12—13 and between these uprights a pick up device is arranged.

The pick up device preferably consists of two disc like elements 14, laterally spaced from each other and preferably maintained in spaced relation by means of spacing devices 15. These elements 14 are secured together by means of suitable fastening devices 16 so that the elements will rotate in unison. The elements are each provided with a plurality of arms or portions 17 projecting from the periphery inwardly and terminating short of the axis of rotation of the elements. These arms or portions 17 are provided with radially arranged surfaces 18 and the arms 17 are laterally spaced from each other to form grooves 19 which are open at the ends of the arms 17.

Any number of these surfaces 18 may be provided and are so arranged that when the elements 14 are rotated the surfaces 18 will pass into the hopper 10 and pick up the articles contained therein. As shown in Figure 3, the articles to be handled are screw blanks 20 which are adapted to be picked up by the surfaces 18 as the elements 14 rotate in the direction indicated by the arrows in Figures 1 and 3, and will carry the articles 20 to a position that they will slide down or be fed along the surfaces 18 towards the axis of rotation of the elements 14.

Any suitable means may be provided for supporting and rotating the pick up device thus constructed. A simple and efficient means embodies a plurality of gear wheels 21 with which peripheral teeth 22 on the elements 14 mesh. This pick up mechanism is supported by the lowermost gear wheels 21 and power may be applied to the shaft 23 of one of the gear wheels 21 for operating the latter.

If desired the gear wheels 21 may be formed by reducing a portion thereof as at 24 and which reduced portion is arranged

adjacent the space between the elements 14 so as to prevent injury to the gears 21.

Disposed adjacent the axis of the element 14 is a control device 25 which is supported in any suitable manner preferably by means of a suitable bearing 26 and connected with the device 25 is an operating handle 27 by means of which the element 25 may be rotated or adjusted.

The extremities of the arms or portions 17 of the elements 14 terminate in close proximity to the periphery of the element 25 and the latter is provided with a groove 28, one end 29 of which opens through the periphery of the element 25 and the other end 30 of the groove opens through the lateral face 31 of the element.

This element 25 is adapted to be rotated or positioned so that the space or groove 19 between the portions 17 of the elements 14 may be brought into register therewith to permit the articles 20, as they are fed by gravity down the surfaces 18, to enter the groove 28.

The element 25 is so positioned that the articles 20 will be delivered from the surfaces 18 at any predetermined point in the rotation of the elements 14. This is accomplished by rotating the element 25 with respect to the elements 14.

Leading from the hopper 10 is a chute 32. The inlet end 33 thereof is disposed adjacent the axis of rotation of the element 25 and the inlet end 33 is spaced from the discharge outlet of the groove 28 to form a space or gap 34 across which gap the articles 30 will jump when they are delivered into the chute 32. Connected with the element 25 and forming an extension of the groove 28 is an element 35 which has a groove 36 therein adapted to register with the portion 30 of the groove 28. This element 35 is adjustably connected with the element 25 in any suitable manner preferably by means of screws or bolts 37 which pass through slots 38 in the element 35. The face 31 of the element 25 is provided with a recess 39 adjacent the end 30 of the groove 28. This recess 39 is provided with walls diverging from the surface 40 of the element 25.

The element 35 is provided with a similar recess 41 in its rear face and is provided with walls diverging from the surface 42 of the element so that when the element 35 is secured in position against the surface 31 of the element 25, the recesses 39 and 41 will be brought into register.

No matter to what extent the element 25 is rotated for controlling the point at which the element 20 will be delivered from the pick up arms or portions 17 of the elements 14. When the element 25 is rotated to the desired extent, the element 35 will also be rotated therewith but after the element 25 has been properly positioned, the fastening screws or bolts 37 may be loosened and the element 35 then adjusted with respect to the surface 31 of the element 25 so that the groove 36 in the element 35 will be in a proper position with the inlet 33 of the chute 32 to deliver the articles thereinto.

In use the element 25 is rotatably adjusted within certain limits, to maintain the groove or slot 28 in a proper position to receive the bolts or screws. The position of the element 25 is important in that it controls or regulates the feeding operation and compensates varying sizes and weights of the articles. If the element 35 is rotated with the element 25 the end of the slot 36 will not be in a proper position, as the end of the groove in the element 35 would be moved out of alinement with the chute 32. Therefore, the element 35 being adjustable with respect to the element 25, the end of the groove in the element 35 will be maintained in proper alinement with the chute so that the articles will jump across the space or gap and into the chute 32. The recesses 39 and 41 in the respective elements compensate the varying angles which the bolts assume in passing through the element 25 to the element 35 and will prevent binding or arresting of the feeding movement of the screws or bolts.

As the articles are delivered from the arms 17 into the groove 28 they will be suspended by their heads and when the element 35 is adjusted with respect to the element 25, the recesses 39 and 41 will permit of the adjustment of the element 35 with respect to the element 25 without interfering with the passage of the articles along the groove or chute. This is accomplished by reason of the fact that the articles will be suspended entirely by their heads as they pass from the element 25 to the element 35 and the shanks of the screws will be permitted to swing in the recesses 39 and 41 if necessary.

It is thought that the operation of this device will be clearly understood from the foregoing but briefly stated it is as follows. The articles to be picked up are placed within the hopper 10 and the elements 14 are rotated in the direction indicated by the arrows in Figures 1 and 3. As these elements rotate the surfaces 18 will pass into the supply of articles within the hopper and will pick up a sufficient number of articles to substantially fill the grooves or spaces 19. Inasmuch as the open ends of these spaces or grooves 19 are closed by the periphery of the element 25 the articles 20 will be maintained against being discharged therefrom until the grooves or spaces 19 are brought into register with the inlet 29 of the groove 28 in the element 25. The articles will then be fed by gravity from the surfaces 18 into the groove 28 and they will also travel by

gravity through this groove and through the groove 36. From the groove 36 the articles will jump across the space or gap 34 and into the chute 32 from which chute 32 they are conveyed to the point of use.

Should the articles accumulate in the chute 33 faster than they can be fed therethrough the surplus articles will drop into the gap 34 and back into the hopper, or should an article which is too large to pass into the chute 33, or if the articles should be presented to the chute 33 in an improper position, the article will also drop into the gap 34 and back into the hopper.

If desired a clearance device 43, preferably in the form of a rotatable member mounted in a bearing 44 and driven by a shaft 45, which receives its motion from any suitable source, may be arranged adjacent the gap 34 so as to assist in discharging the articles should they accumulate at the inlet to the chute.

It will therefore be manifest that with this improved construction the chute which receives the articles 20 from the surfaces 18 of the pick up arms embodies the groove 28 in the element 25 and also the groove 36 in the element 35 and the chute is provided with a gap 34 at a point in its length and within the hopper 10 so that the articles which are discharged through the gap 34 will drop back into the hopper.

The elements 14 are provided with opening 46 therein adjacent the surfaces 18 and the bottoms 47 of these openings are adapted to pass below the extreme bottom of the hopper 10, as shown in Figure 4, to insure that all of the articles 20 in the hopper will be picked up by the pick up device during the rotation of the latter.

While the preferred form of the invention has been herein shown and described it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. A device of the character described embodying a hopper, a delivery chute, and pick up mechanism operative within the hopper and embodying a radially disposed pick up formation having a constant direction of motion and adapted to be brought into register with the said delivery chute, said chute embodying an adjustable section whereby the point in the operation of the said formation at which the articles will be delivered therefrom to the chute may be varied at will.

2. A device of the character described embodying a hopper, a delivery chute, and pick up mechanism operative within the hopper and embodying a radially disposed pick up formation having a constant direction of motion and adapted to be brought into register with the said delivery chute, said chute embodying an adjustable section whereby the point in the operation of the said formation at which the articles will be delivered therefrom to the chute may be varied at will, there being a gap in the chute across which the articles will jump during their travel.

3. A device of the character described embodying a hopper, a delivery chute, pick up mechanism operative within the hopper and embodying a radially disposed pick up formation having a constant direction of motion and adapted to be brought into register with the said delivery chute, said chute embodying an adjustable section whereby the point in the operation of the said formation at which the articles will be delivered therefrom to the chute may be varied at will, there being a gap in the chute across which the articles will jump during their travel, and a mechanical clearance device adjacent the said gap.

4. A device of the character described embodying a hopper, a delivery chute, pick up mechanism operative within the hopper and adapted to discharge the articles into the chute, and means whereby the point at which the articles will be delivered from the pick up mechanism to the chute may be varied at will to compensate varying sizes and weights of the articles.

5. A device of the character described embodying a hopper, a delivery chute, said chute having a gap across which the articles jump, pick up mechanism operative within the hopper and adapted to deliver the articles to the chute, and means whereby the point at which the pick up mechanism will deliver the articles to the chute may be varied at will to compensate varying sizes and weights of the articles.

6. A device of the character described embodying a hopper, a delivery chute, said chute having a gap across which the articles jump, pick up mechanism operative within the hopper and adapted to deliver the articles to the chute, means whereby the point at which the pick up mechanism will deliver the articles to the chute may be varied at will to compensate varying sizes and weights of the articles, and a clearance device disposed adjacent the said gap.

7. A device of the character described embodying a hopper, a delivery chute, a plurality of radially disposed pick up formations, the discharge ends of the said formations being adapted to be successively brought into register with the receiving end of the chute, and means whereby the point of delivery of the articles from the said formations may be varied at will to compensate varying sizes and weights of the articles.

8. A device of the character described embodying a hopper, a pick up device rotatable therein and embodying complementary members, each member having radially disposed and inwardly projecting pick up formations terminating short of the axis of the members, means securing said members and said formations together and in spaced relation to form slots therebetween, a receiver for receiving the articles from the said formations, said receiver embodying a section having a slot, the entrance of the slot being disposed adjacent the path of movement of the delivery end of the said pick up formations, and means mounting said section for adjustment whereby the point in the cycle of operation of the pick up device at which the article is delivered therefrom may be varied at will.

9. A device of the character described including a hopper, a receiver for the articles, a pick up mechanism operating within the hopper, said mechanism including a radially disposed pick up formation adapted to be brought into register with said receiver, said receiver including a member embodying adjacent sections having abutting faces, and means for securing the sections together for relative adjustment, said sections having registering grooves for receiving and conveying away a blank, the abutting faces of the sections having enlarged registering recesses communicating with the respective grooves.

10. A device of the character described including a hopper, a receiver for the articles, a pick up mechanism operating within the hopper, said mechanism including a radially disposed pick up formation adapted to be brought into register with said receiver, the latter including a member embodying adjacent sections having abutting faces, means for securing the sections together for relative adjustment, said sections having registering grooves for receiving and conveying away a blank, the abutting faces of the sections having enlarged registering recesses communicating with the respective grooves, and means mounting the member for adjustment whereby the point in the cycle of operation of the said pick up device at which the article is delivered therefrom may be varied at will.

11. A machine for feeding blanks, embodying a hopper, a delivery chute, a rotatable pick-up device operative in the hopper, said device embodying a plurality of spaced and radially disposed pick-up formations terminating short of the axis of rotation of the said device, each of said formations having a continuous slot therein opening through the end thereof and adapted to be brought into register with the said chute, the blanks moving by gravity upon said formations and out of the respective slots and means whereby the point in the cycle of operation of the pick-up mechanism at which the blanks are delivered into the chute may be varied.

12. A machine for feeding blanks, embodying a hopper, a delivery chute, a pick-up device operative within the hopper and embodying a radially disposed pick-up formation having a continuous slot therein, the blanks moving by gravity in the said slot and out of the end thereof, and means whereby the point in the cycle of operation of the said pick-up device at which the blanks are delivered into the chute may be varied.

In testimony whereof I have signed my name to this specification, on this 5th day of June, A. D. 1923.

PAUL H. McCAIN.