Oct. 20, 1925. 1,558,079

E. W. DUSTON ET AL

FEEDER FOR AUTOMATIC METAL WORKING MACHINES

Filed Aug. 30, 1922

Fig. 1.

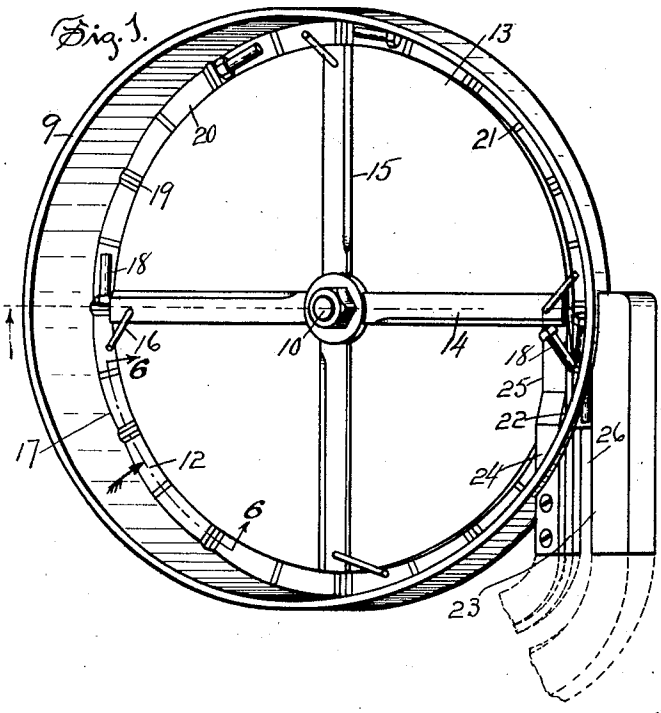


Fig. 4.

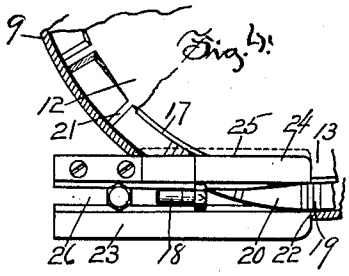


Fig. 5.

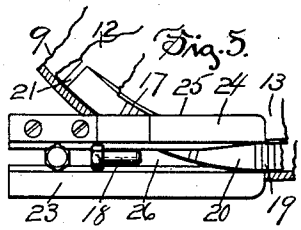


Fig. 2.

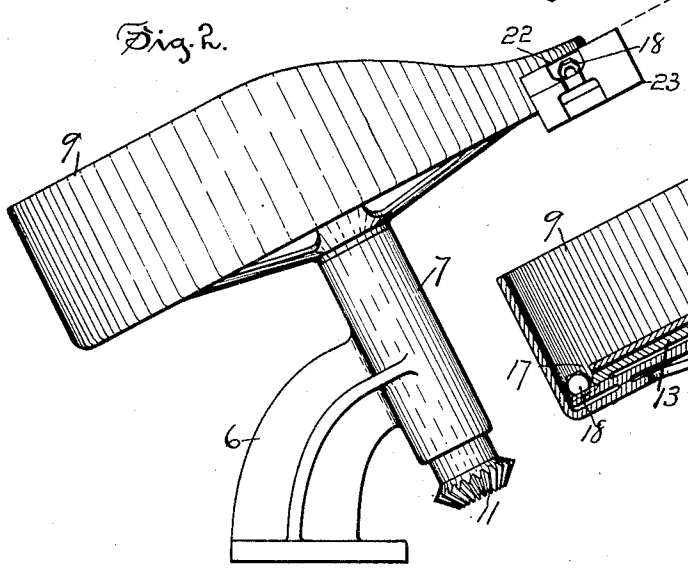


Fig. 3.

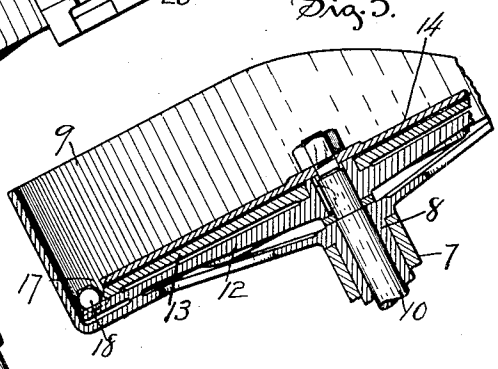
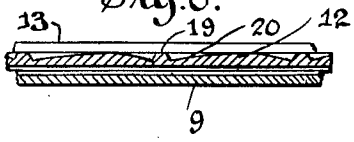


Fig. 6.



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Patented Oct. 20, 1925. 1,558,079

UNITED STATES PATENT OFFICE.

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FEEDER FOR AUTOMATIC METAL-WORKING MACHINES.

Application filed August 30, 1922. Serial No. 585,217.

To all whom it may concern:

Be it known that we, ERNEST W. DUSTON and REUBEN S. CROSBY, each a citizen of the United States, and residents, respectively, of Cleveland, in the county of Cuyahoga and State of Ohio, and Hartford, in the county of Hartford and State of Connecticut, have invented new and Improved Feeders for Automatic Metal-Working Machines, of which the following is a specification.

Our invention relates to the class of devices employed to supply articles to the cutting tools of machines for making screws, bolts, nuts, and the like, and an object of our invention, among others, is to provide a device of this class that shall be particularly efficient in operation and simple in construction. One form of device embodying our invention and in the construction and use of which the objects herein set out, as well as others, may be attained, is illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of our improved feed device.

Figure 2 is a side view of the same.

Figure 3 is a view in central vertical section through a portion of our improved feeder.

Figure 4 is a view illustrating a manner of reception of the articles by the delivery chute.

Figure 5 is a similar view illustrating another manner in which the articles are received by the delivery chute.

Figure 6 is a fragmentary view on a plane denoted by the dotted line 6—6 of Figure 1.

In the accompanying drawings the numeral 6 denotes a supporting bracket that is adapted to be secured to the frame of a machine for making screws, bolts, nuts and the like and in a suitable position with respect to the cutting tools of said machine to support a hopper for the feed of articles to such tools, said bracket having a supporting sleeve 7 rigidly connected therewith. A hopper supporting post 8, of tubular construction, is located within the sleeve 7, said post having a hopper 9 rigidly secured at its upper end, said hopper being of any suitable shape, as round, and preferably supported in an inclined position as shown in Figures 1, 2, and 3 of the drawings.

A feed shaft 10 is rotatably mounted in the hollow post 8, this shaft having a feed pinion 11 secured to its lower end and arranged to mesh with any suitable driving gear forming a part of the driving mechanism of the machine, which gear is not shown herein, as its arrangement and operation will be readily understood by those skilled in the art. The shaft 10 projects beyond the upper end of the post 8 and has secured thereto a feed plate 12 of a size in diameter substantially that of the interior of the hopper 9. A rectifying plate 13 is mounted on a hub of the feed plate 12 with its under surface in close proximity to or resting against the upper surface of the feed plate 12. This plate 13 is loosely mounted on said hub and is held stationary and against rotation with said hub, in a manner to be hereinafter described.

An agitator 14 is secured to the shaft 10 to rotate therewith, this agitator preferably comprising a plurality of arms projecting radially from the shaft 10 and as shown in Figure 1 of the drawing. Each of these agitator arms has a knife edge 15 at its advancing edge and a dislodging pin 16 projecting diagonally upward may be secured at or near the end of each arm.

It will be noted, from an examination of Figure 3, that an annular space is formed between the periphery of the plate 13 and the inner surface of the sides of the hopper, said plate being smaller in diameter than the diameter of the hopper and this space constituting a positioning groove 17 into which the articles, as bolts 18, will move. This groove is narrower in dimension than are said articles in length, with a result that as such articles slide into the groove, by reason of the inclined position of the hopper, that portion of the article in contact with the feed plate 12 will be moved forward, and if another part of the article rests upon or against the stationary rectifying plate 13 the "drag" thus caused will straighten the article and locate it entirely in the positioning groove, and it will be carried along said groove by the rotation of the feed plate 12 to a delivery chute to be hereinafter described.

In order to increase the friction of the plate 12 upon the articles, the upper surface of said plate, at that portion forming the bottom of the groove 17, is provided

with carriers 19 in the form of projections from the lower ends of inclined surfaces 20, which surfaces terminate in peaks 21. This arrangement provides means for certainly carrying the bolts upwardly along their inclined path and when they reach the upper end should any of the bolts or articles be resting upon others, and be thus located above the mouth of the positioning groove 17 and upon the plate 14, they will roll downwardly along the plate to the lower side of the hopper to be again carried upwardly by the feed plate.

A delivery opening 22 is formed in one side of the side wall of the hopper, and a delivery chute 23 is located to receive the articles, as bolts, and direct them through said opening. This delivery chute comprises two side members spaced apart a distance slightly greater than the diameter of the stem of the bolt, said side member 24 projecting into a notch 25 formed in the edge of the rectifying plate 13, and said plate, by this construction, is held stationary and against rotary movement on the hub of the feed plate 12, as hereinbefore referred to. The space between the side members of the chute comprises a groove 26 registering with the positioning groove 17 in the bottom of the hopper, said groove 26 thus constituting a runway for the bolts that are forced to pass outwardly along the chute by the action of oncoming bolts and by gravity.

It will be noted from this construction that the bolts will be positioned with their stems hanging within the groove 26 and with their heads resting upon the side members of the chute, whether said bolts be carried into the runway 26 head first or point first, in either case the bolt righting itself as soon as the point passes off from the feed plate, said righting operation taking place sooner, when the point is in advance, as shown in Figure 4, than when the head is in advance, as shown in Figure 5.

The agitator 14 is made use of to disturb the bolts and prevent them from assuming a position or positions detrimental to feeding movement thereof.

While the delivery chute may be located to receive bolts from any point around the hopper, yet we prefer to project it from the hopper at a point above a horizontal plane extended through the axial center of the hopper, and extremely satisfactory results have been obtained by us when such chute is positioned to receive bolts from the hopper at the top portion thereof, and as shown in the drawings. By thus locating said chute, clogging of bolts by an over-accumulation thereof at or near the mouth of the chute is avoided, as such bolts as cannot enter the chute will ride upon others and thereby be carried out of the groove in the hopper and will roll to the lower side of the hopper to be again carried upward for delivery to the feeding chute.

In accordance with the provisions of the patent statutes we have described the principles of operation of our invention, together with the device which we now consider to represent the best embodiment thereof; but we desire to have it understood that the device shown is only illustrative and that the invention may be carried out by other means and applied to uses other than those above set out.

We claim—

1. A feeder comprising a case, a feed plate rotatably mounted in said case, means to form a groove with said feed plate as the bottom thereof within said case, and a delivery chute to receive articles from said groove.

2. A feeder comprising a case, a feed plate rotatably mounted in said case, a rectifying plate located in the case to form a groove with said feed plate as the bottom thereof, and a delivery chute to receive articles from said groove.

3. A feeder comprising a case, a feed plate rotatably mounted in said case, a rectifying plate overlying said feed plate and held stationary within the case, said rectifying plate being smaller in diameter than said feed plate to form a groove with said feed plate as the bottom thereof, and a delivery chute to receive articles from said groove.

4. A feeder comprising a case mounted with its bottom in an inclined position, a feed plate rotatably mounted in said case to form the bottom of a chamber therein, a rectifying plate located in said case and smaller in diameter than said case to form a groove therein with said feed plate as a bottom for said groove, means for rotating the said feed plate, and a delivery chute to receive articles from said groove.

5. A feeder comprising a case, a feed plate rotatably mounted in said case and having an uneven surface comprising the bottom of a feed groove, means for forming the sides of said feed groove, and a delivery chute to receive articles from said groove.

6. A feeder comprising a case, a feed plate rotatably mounted in said case, a rectifying plate overlying said feed plate and of a size to form a feed groove with said feed plate as the bottom thereof, an agitator overlying said rectifying plate, and a delivery chute to receive articles from said groove.

7. A feeder comprising a case, a tubular support for said case, a shaft projecting through said support, and rotatably mounted therein, a feed plate secured to said shaft, a rectifying plate supported by said shaft and of a size to form a groove

with said feed plate as the bottom thereof, means for holding the rectifying plate against rotary movement, and a delivery chute to receive articles from said groove.

8. A feeder comprising a case, a tubular support for said case, a shaft projecting through said support and rotatably mounted therein, a feed plate secured to said shaft and having a hub, a rectifying plate mounted on said hub and of a size to form a groove with said feed plate as the bottom thereof, means for holding the rectifying plate against rotary movement, and a delivery chute to receive articles from said groove.

9. A feeder comprising a case, a tubular support for said case, a shaft projecting through said support and rotatably mounted therein, a feed plate secured to said shaft, a rectifying plate loosely supported on said shaft and of a size to form a groove with said feed plate as the bottom thereof, and a delivery chute in engagement with said rectifying plate to prevent rotation thereof and positioned to receive articles from said groove.

10. A feeder comprising a case, a tubular support for said case, a shaft projecting through said support and rotatably mounted therein, a feed plate secured to said shaft, a rectifying plate loosely supported by said shaft and of a size to form a groove with said feed plate as the bottom thereof, means for holding the rectifying plate against rotary movement, an agitator secured to said shaft for sweeping movement above said rectifying plate, and a delivery chute to receive articles from said groove.

11. A feeder comprising a case, a tubular support for said case, a shaft projecting through said support and rotatably mounted therein, a feed plate secured to said shaft in proximity to the bottom of said case for bearing thereon, a rectifying plate supported by said feed shaft in proximity to said feed plate for support thereby, said rectifying plate being of a size to form a groove with said feed plate as the bottom thereof, means for holding the rectifying plate against rotary movement, and a delivery chute to receive articles from said groove.

12. A feeder comprising a stationary case having a bottom arranged in an inclined position with a marginal groove around said bottom of a width sufficient to entirely receive an article, whereby said article is straightened in the direction of the length of said groove, a delivery chute to receive articles from said groove at the upper edge of said bottom, and means within the case for feeding articles to said delivery chute.

13. A feeder comprising a case having a bottom arranged in an inclined position with a marginal groove around said bottom of a width sufficient to entirely receive an article, whereby said article is straightened in the direction of the length of said groove, a delivery chute to receive articles from said groove at the highest point of the edge of said bottom, and means within the case for feeding articles to said delivery chute.

14. A feeder comprising a case, a feed plate rotatably mounted in said case, a rectifying plate located in said case and smaller in diameter than said case to form a groove therein with said feed plate as the bottom of said groove, and a delivery chute to receive articles from said groove.

15. A feeder comprising a case, a feed plate rotatably mounted in said case, means to form a groove with said feed plate as the bottom thereof, an agitator overlying said groove, and a delivery chute to receive articles from said groove.

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