March 8, 1927. 1,619,971

E. A. DEAN

FEEDING MECHANISM FOR SWAGING MACHINES

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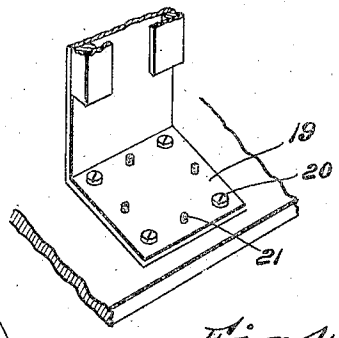


Fig. 4

Fig. 1

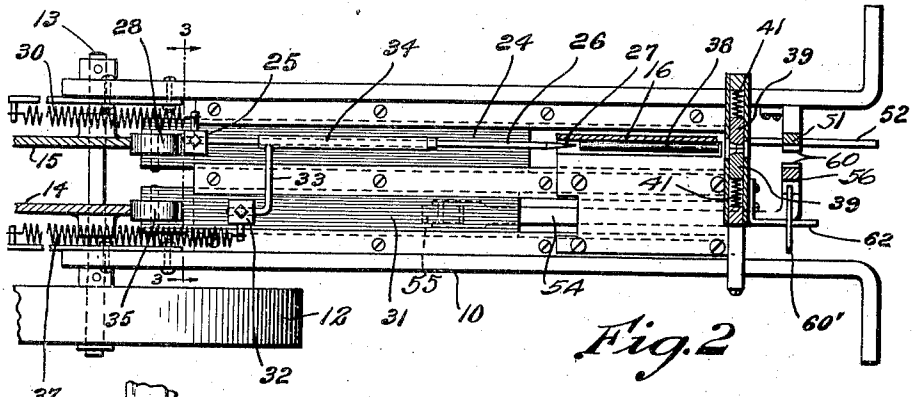


Fig. 2

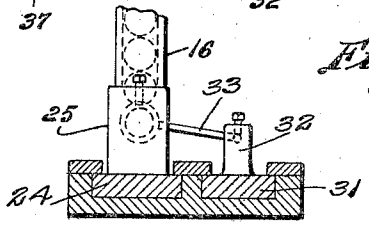


Fig. 3

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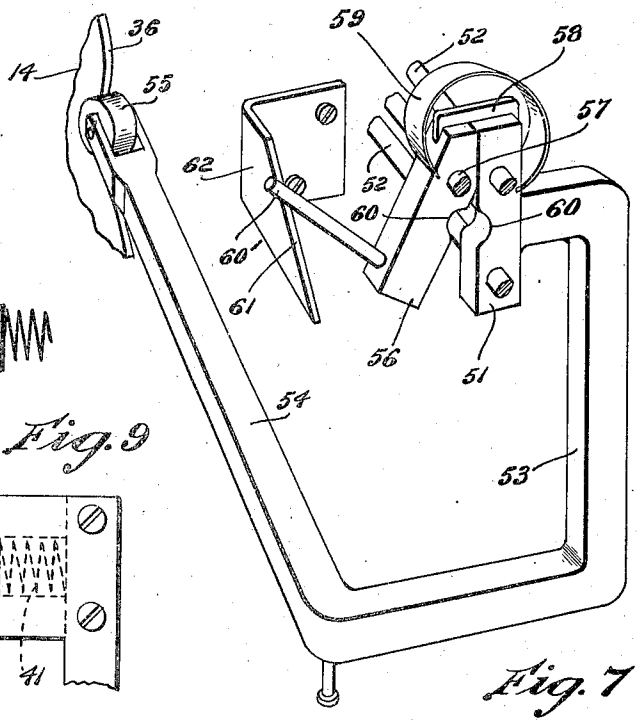


Fig. 7

Fig. 8

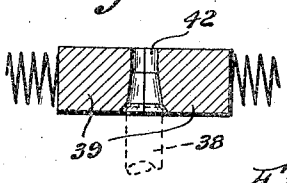
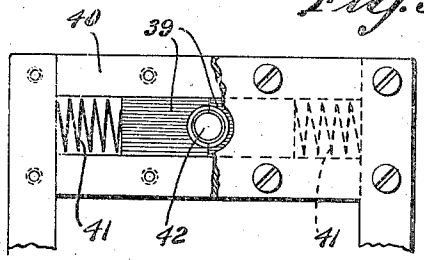


Fig. 9



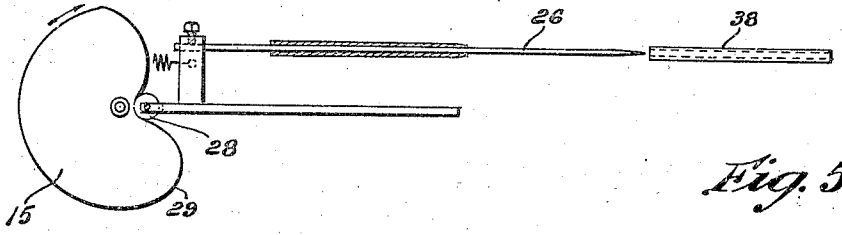


Fig. 5

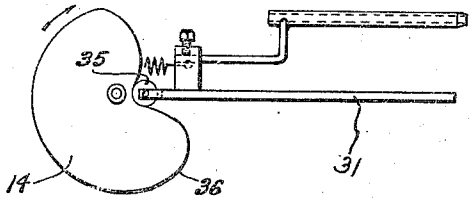


Fig. 6

Fig. 10

Fig. 11

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Patented Mar. 8, 1927. 1,619,971

UNITED STATES PATENT OFFICE.

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FEEDING MECHANISM FOR SWAGING MACHINES.

Application filed February 9, 1923. Serial No. 618,144.

This invention relates to machines for feeding tubular blanks to a swaging machine or other device to be operated upon, and the invention has for its object to provide means for engaging a tubular blank and advancing it into position to be operated upon, then to withdraw and deposit the blank, repeating the operations successively and automatically.

A further object of the invention is to provide a magazine for supplying the blanks and to mount the supporting mandrel in line with the blank next in position to be fed and to advance this blank into position to be operated upon.

A further object of the invention is the provision of means for frictionally engaging the blanks to prevent them from being drawn into the swaging machine while operating upon a blank to point it.

A still further object of the invention is the provision of a pair of cams one operating upon the mandrel to force it through the blank while the other operates upon the pusher to advance the tube into position to be operated upon by the swaging machine, the cams serving as a positive stop for preventing the tubes from working back while being operated upon by the swaging machine.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings,

Figure 1 is a side elevation of my improved machine showing the operating cams partly broken away and the swaging dies in section.

Figure 2 is a top view showing the parts of the machine in section.

Figure 3 is a sectional end view on line 3—3 of Figure 2.

Figure 4 is a modification illustrating vertical adjustability of the magazine.

Figure 5 is a side elevation partly in section illustrating the general shape of the cam which drives the mandrel sleeve shown in section on the mandrel.

Figure 6 is a detail illustrating the general shape of the cam which drives the pusher on the mandrel.

Figure 7 is a perspective view illustrating the jaws of the frictional gripper and the cooperating inclined member for opening the jaws to release the finished tube and receive the next one to be operated upon.

Figure 8 is a sectional top view illustrating the spring blocks for preventing a forward movement of the tube while the mandrel is being forced thereinto.

Figure 9 is a rear view of the detent blocks showing them slidably mounted in their frames.

Figure 10 is a perspective view of one of the tubes.

Figure 11 shows one end of a tube as having been swaged to a point.

It is found in practice of advantage in machines of this character to provide a magazine for supplying tubes to be operated upon and also to mount a mandrel in line with the lowermost tube whereby an advancing motion of the mandrel carries the same through the tube, and to provide a pusher for driving the tube into the swaging device, also to provide direct acting cams for operating the mechanism which cams accurately advance the work to be operated upon and positively prevent the work from sliding back while under action of the swager; also to provide frictional means for preventing the swaging action on the tube from drawing the tube in faster than it should be fed; and the following is a detailed description of one form of machine for performing these functions.

With reference to the drawings, 10 designates the frame of a machine which may be constructed in any desired form and which may be supported on suitable legs 11, and in the outer end of this frame is mounted a cam shaft 13 on which the two operating cams 14 and 15 are mounted and this shaft is driven through a large driving pulley 12 which is weighted by means of weights (not shown), to counterbalance the oppositely overhanging portions of the cams 14 and 15. On this frame 10, I have supported a magazine 16 in which a multiplicity of tubes 17 are mounted and fed from the feeder 18 above.

This magazine may be provided with an angular base 19 see Figure 4, in which are two sets of adjustable screws 20 and 21, whereby the magazine may be adjusted vertically to bring the central axis of the lowermost tubes of different diameters on the axial line of the mandrel, presently described. At the lower end of this magazine,

I have provided a yieldable supporting block 22 which is mounted on springs 23 to yield when the pusher member presently described, passes thereover.

In the frame, I have mounted a sliding member 24 on which is mounted a post 25 and in this post is secured a mandrel 26 pointed at its inner end 27. The outer end of this sliding member is provided with a roller 28 which engages the edge 29 of the operating cam 15 and this slide 24 is drawn back to hold its roll in contact with the edge of the cam by means of the spring 30.

Another slide 31 is used as a guide to move parallel with the slide 24 and on the slide 31 is mounted a post 32 to which is attached a connection 33 to the tubular pusher 34 mounted on the mandrel 26 and the outer end of this slide is provided with a friction roll 35 which engages the edge 36 of the cam 14, this slide roll being held back against its cam by means of a strong tension spring 37.

In order to arrest the forward advancing of the lowermost tube 38 when engaged by the mandrel a pair of yieldable blocks 39 are mounted in the frame 40 and press inwardly toward each other by springs 41. These blocks are provided with a tapering hole 42 through them and when this tube 38 is first advanced by the mandrel its inner end engages the edge of this tapering hole and is thus arrested until the mandrel enters and passes through the tube, the pointed end of the mandrel then serving to press the blocks apart permitting the tube to be advanced by a follower pusher into position to be engaged by the swaging blocks 70.

It has been found in practice that as these swaging blocks operate upon the tube to point it that the tube often has a tendency to advance and be drawn into the swaging hammers faster than it is pushed by its advancing cam. To prevent this action of the tube while being operated upon, I have provided a gripper for holding the tube back and preventing such advancement, which gripper comprises essentially a fixed jaw 51 which is mounted to slide on the two guide pins 52 and to which jaw is attached an arm 53 leading down and around and back as at 54 so that its roller 55 will engage the edge 36 of the cam 14 and a swinging jaw 56 is mounted to slide endwise upon a pin 57 and is supported at its upper end by the fixed jaw by a key or hinge plate 58 and this swinging jaw is pressed against the fixed jaw by means of a strong tension spring 59. Both of these jaws are grooved as at 60 to provide an opening adapted to embrace the opposite sides of the tube to prevent it from being drawn into the swaging machine except as fast as it is pushed by its operating cam.

In order to open this swinging jaw 56, I have provided the same with a handle 60′ which extends over in position to engage the inclined edge 61 of a fixed blade 62 and as the cam 14 rotates it permits the arm 54 to recede under tension of spring 63 whereby this pin 60′ is caused to ride up on the inclined edge of the blade 62 to withdraw the swinging edge 56 from contact with the fixed jaw 51 and after the cam 14 has advanced the tube 38 up into position to be engaged by the hammer blocks 40 then this arm 54 is advanced by the same cam coming in contact with roller 55 to release this jaw to engage the tube, which jaw then frictionally retains the tube while it is being forced therethrough by action of the cam upon the pusher 34.

After the tube has been pointed the cams are rotated to withdraw the mandrel and the pusher and subsequently acts upon this gripper permitting it to be withdrawn under tension of spring 63 to be opened in the manner above described to release the finished tube to be dropped into a receptacle below. This jaw then remains open until a fresh tube has been positioned when the operation is repeated.

My improved machine is extremely simple and practical in construction and effective in its operation and by its use tubes are engaged successively, operated upon and discharged from the machine.

The foregoing description is directed solely towards the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

I claim:

1. An improved feeding mechanism for swaging machines comprising a feeding mandrel, means for supporting the work in the path of the mandrel, means for advancing the mandrel to engage and move the blank into position to be operated upon, and means for gripping and retaining the work during the pointing operation.

2. An improved feeding mechanism for swaging machines comprising a feeding mandrel, means for supporting the work in the path of the mandrel, means for advancing the mandrel to engage and guide the work, independently operated means for advancing the work into position to be operated upon, and a frictional gripper for controlling the movement of the work during the pointing operation.

3. An improved feeding mechanism for swaging machines, comprising a feeding mandrel, means for supporting the work in the path of the mandrel, a direct acting cam for advancing the mandrel into a tube, a tube pusher mounted on the mandrel, a cam for advancing the tube pusher independently of the movement of said mandrel, and

means for frictionally gripping and retaining the tube during the pointing operation.

4. An improved feeding mechanism for swaging machines, comprising a magazine for carrying a plurality of tubes, a feeding mandrel operatively located in line with the tube positioned in the magazine to be next operated upon, and means for advancing the mandrel to engage this tube and advance the same into position to be operated upon.

5. An improved feeding mechanism for swaging machines, comprising a feeding mandrel, means for supporting the work in the path of the mandrel, means for advancing the mandrel to engage and guide the work, independently operated means for advancing the work into position to be operated upon, a frictional gripper for controlling the movement of the work during the pointing operation, and means for opening the jaws of the gripper for releasing the finished tube and receiving the next to be operated upon.

6. An improved feeding mechanism for swaging machines, comprising a magazine for carrying a plurality of the tubes, a yieldable rest for the lowermost tube, a guiding mandrel operatively mounted in line with the next tube in the magazine to be fed, a pusher slidable on the mandrel to advance the tube from its yieldable rest to be operated upon.

7. An improved feeding mechanism for swaging machines, comprising a magazine for carrying a plurality of the tubes, a rest for the lowermost tube, means for adjusting the magazine vertically, a feeding mandrel, and means for advancing the mandrel and the tubes into position to be operated upon.

In testimony whereof I affix my signature.

EDSON A. DEAN.