

May 20, 1941.

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2,242,502

IMPLEMENT FOR AND METHOD OF FORMING AND APPLYING JUMP RINGS

Filed May 31, 1940

2 Sheets-Sheet 1

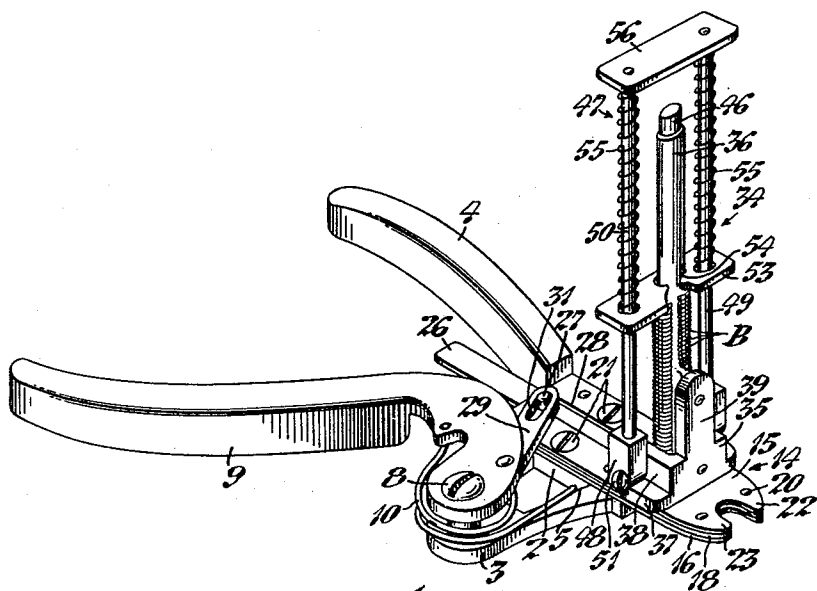


Fig. 1.

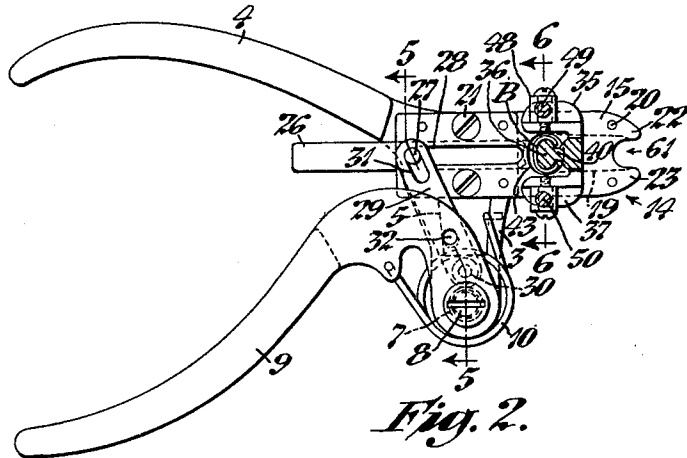


Fig. 2.

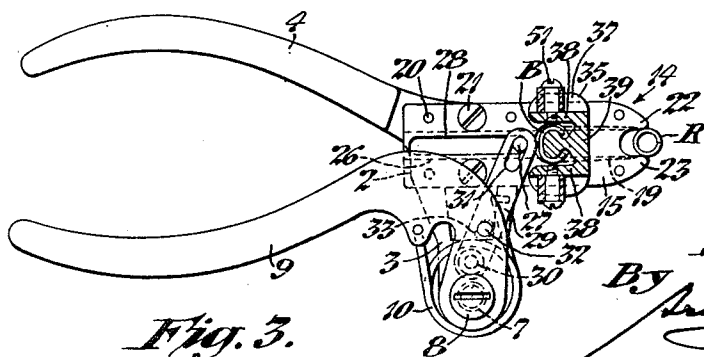


Fig. 3.

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2 Sheets-Sheet 2

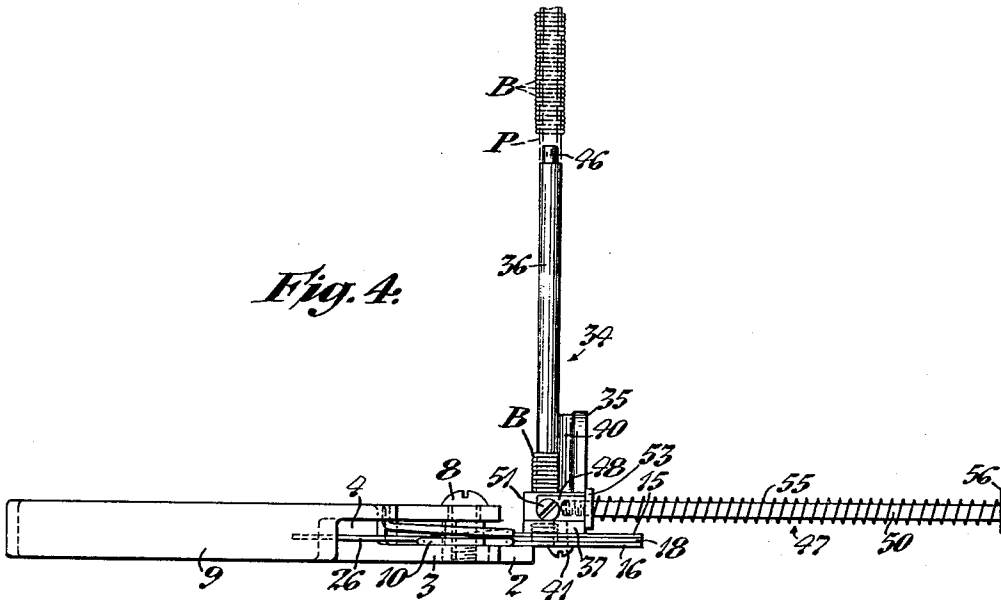


Fig. 4.

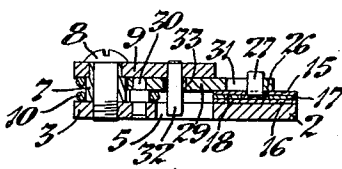


Fig. 5.

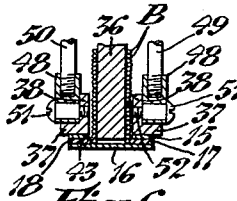


Fig. 6.

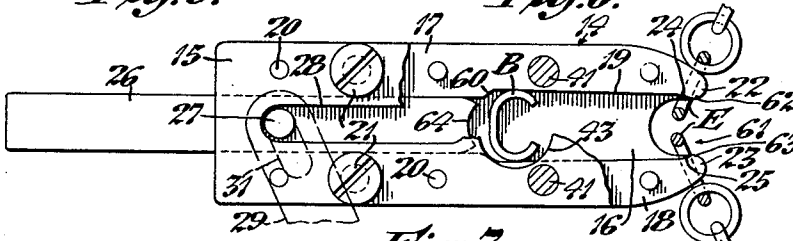


Fig. 7.

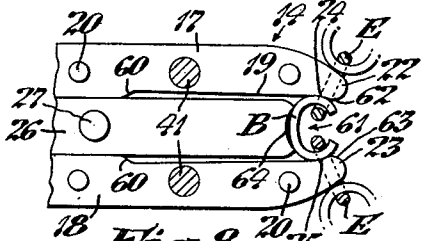


Fig. 8.



Fig. 9.

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UNITED STATES PATENT OFFICE

2,242,502

IMPLEMENT FOR AND METHOD OF FORM-
ING AND APPLYING JUMP RINGS

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12 Claims. (Cl. 59—35)

The present invention relates to a method of and means for forming and applying "jump" rings to jewelry ornaments or the like, connecting separate sections of chain thereto or to each other and for similar purposes.

One of the objects of the present invention is to provide a method of and implement for forming a closed link or jump ring from an open blank of generally C-shaped contour.

Another object of the invention is to provide a method of and implement for forming and applying such rings by advancing an open blank to cause its ends to be hooked through the parts to be connected and simultaneously compressing and shaping the blank to form a closed link.

Another object of the invention is to provide an implement of the type indicated having a channel with a restricted mouth through which open C-shaped blanks are forced to cause them to be compressed and reshaped to provide closed circular links.

Another object of the invention is to provide a portable implement of the type indicated having an improved construction and arrangement of elements for feeding and forming the blanks.

Still another object of the invention is to provide an implement of the type indicated which is of simple and compact construction to adapt it for economical manufacture and one which is efficient in performing its intended functions.

Further objects of the invention are set forth in the following specification which describes the method of forming and applying the jump rings and an implement of preferred construction for carrying out the steps of the method, by way of example, as illustrated by the accompanying drawings. In the drawings:

Fig. 1 is a perspective view of a plier-type implement incorporating the novel features of the present invention;

Fig. 2 is a plan view of the implement shown partly in section with the driver retracted and illustrating its relation to the magazine core for feeding blanks to the driver;

Fig. 3 is a view similar to Fig. 2 showing the driver in position as actuated by relative movement of the handles to force a blank through the channel in the head of the implement;

Fig. 4 is a side view of the implement showing the feeding means swung to angular position with respect to the magazine core and illustrating the manner in which blanks are supplied to the latter;

Fig. 5 is a transverse sectional view taken on line 5—5 of Fig. 2 showing the means connect-

ing the handle and driver to reciprocate the latter in the head of the implement;

Fig. 6 is a transverse sectional view taken on line 6—6 of Fig. 2 showing the pivotal mounting of the feeding means to adapt it to swing on the head;

Fig. 7 is an enlarged plan view of the head with its top plate shown partly in section to illustrate the contour of the channel through which the blanks are forced and the relationship of the parts at the beginning of a jump ring applying operation;

Fig. 8 is a view similar to Fig. 7 showing the blank advanced through the channel by the driver to cause its ends to hook through the parts to be connected and to be partially reshaped; and

Fig. 9 is a view similar to Fig. 8 showing the jump ring forced through the restricted mouth at the end of the channel to further compress and reshape the blank.

The method and implement of the present invention are particularly adapted for attaching depending spangles or other jewelry ornaments to the links of a supporting chain by means of a connecting link commonly known in the art as a jump ring. Such ornaments may have eyes formed therein or loops or short chain sections attached thereto, and the connecting links or jump rings may be of the same size as the loops or links of the parts which it connects.

In accordance with the present method a blank of generally C-shaped contour is advanced in a predetermined path to cause its opposite ends to hook into the eyes, loops or links to be connected. Simultaneously with its advancement the blank is gradually compressed and reshaped. After the ends of the blank have hooked into the eyes or links of the parts to be connected the blank is further compressed until its ends abut and further reshaped to form a closed circular link.

The present drawings illustrate a preferred embodiment of the implement for performing the steps of the method. The implement comprises a base-member or supporting plate 2 having a lateral arm 3 and a handle 4 projecting rearwardly therefrom. The arm 3 has an opening 5 therein and a pivot-stud 7 projecting from the upper face thereof and connected to the arm by means of a screw 8, see Fig. 5. A movable handle 9 is pivotally mounted on the stud 7 and held in position by the head of the screw 8 which overlies the stud. The handles 4 and 9 are normally maintained in their open spaced-apart relationship illustrated in Fig. 2 by means of a hair-

pin spring 10 looped around the pivot stud 7 with one end hooked to the arm 3 at the side of the opening 5 and its opposite end hooked to the handle 9.

A head 14 for applying and reshaping the jump ring blanks B, which are of generally C-shaped contour to form closed circular links or jump rings R, is mounted on the supporting plate or base-member 2 between the handles 4 and 9. In the implement illustrated in the present drawings the head 14 comprises a pair of superimposed plates 15 and 16 held in spaced-apart relationship by strips 17 and 18 at their opposite sides to form a channel 19 therebetween. The plates 15 and 16 and strips 17 and 18 are held in aligned relationship by dowel pins 20 and fastened to the supporting plate 2 by screws 21 extending through the plates and strips. At the forward end of the head 14 its sides are curved inwardly and the plates 15 and 16 formed with substantially circular recesses to provide opposite jaws 22 and 23 adapted to hook through the links or eyelets E of the spangles, chain sections or the like to be connected, see Figs. 7 and 8. The forward ends of the strips 17 and 18 have their inner sides curved inwardly at 24 and 25 for a purpose as explained hereinafter.

Mounted for reciprocation in the channel 19 of the head 14 is a driver 26 in the form of a flat bar having a pin 27 projecting through an elongate slot 28 in the upper plate 15 of the head. The driver 26 is adapted to be operated by an oscillatable lever 29 pivotally mounted at one end on a pin 30 projecting upwardly from the supporting plate 2 adjacent the pivot-stud 7 for the handle 9 and having a slot 31 adjacent its opposite end embracing the pin 27 on the driver. The lever 29 is connected to the handle 9 by means of a pin 32 projecting through a slot 33 in the lever whereby rocking movement of the handle operating through the pin and slot connection rocks the lever to slide the driver 26 forward with an increased or multiplied extent of movement.

Extending from the head 14 at right-angles to the plane of movement of the driver 26 is a magazine 34 comprising a base-member 35 adapted to seat on the plate 15 of the head 14 and a core 36 projecting upwardly from the base. The base 35 is generally channel-shaped in cross-section with laterally extending feet 37, side flanges 38 projecting upwardly from the feet and a forward flange 39 to which the core 36 is attached by an integral connecting web 40. The base 35 is mounted on the upper plate 15 of the head 14 by means of screws 41 extending through the head and screwed into the feet 37, see Fig. 4. The upper plate 15 of the head 14 has an opening 43 underlying the core 36 whereby to provide for entrance of the blanks into the channel 19, see Fig. 6. The core 36 is oval in cross-section to adapt it to receive the C-shaped jump ring blanks B, see Figs. 1 and 2, and the upper end of the core has a reduced end 46 for receiving the end of a tubular carrier P on which the blanks B are held for transfer to the magazine of the implement. With the end of the carrier P aligned with the end of the magazine core 36, as illustrated in Fig. 4, the blanks B may be slid from the carrier onto the magazine core to adapt them to enter the channel 19 through the opening 43 in the plate 15 of the head 14.

The blanks B are fed along the core 36 by a pusher-mechanism comprising an inverted U-shaped frame 47 having blocks 48 at the ends

of its opposite legs 49 and 50 pivotally mounted on screws 51 threaded into tapped bores 52 in the sides of the opposite flanges 38 of the magazine base 35. Mounted to slide on the legs 49 and 50 of the frame 47 is a pusher in the form of a plate 53 having a centrally located aperture 54 closely surrounding the core 36. The plate 53 is yieldingly urged toward the head 14 of the implement by means of helical springs 55 coiled around the legs 49 and 50 of the frame 47 and acting between the cross-member 56 of the U-shaped frame and the top of the plate. By this form of construction the frame 47 is mounted for rocking movement from a position parallel to the magazine core 36, as illustrated in Fig. 1, to a position at right-angles thereto, as illustrated in Fig. 4, to permit the blanks B to be slid onto the core.

In accordance with the present invention the inside edges of the strips 17 and 18 constituting the sides of the channel 19 are offset at 60 to adapt the C-shaped blanks B to be received therebetween as they are advanced by the pusher 53 and these edges gradually converge toward the outlet end or mouth 61 of the channel 19. At the mouth 61 of the channel 19 the edges of the strips 17 and 18 converge more abruptly or are curved at 24 and 25, as previously described, thus forming inwardly extending lobes 62 and 63 spaced apart at their apex a distance equal to the diameter of the jump ring R to be formed. The end 64 of the driver 26 engaging the blanks B is also concaved to the circular contour of the jump ring R to be formed, see Fig. 9.

The driver 26 is adapted to act on a blank B to advance it through the channel 19 to cause its ends to hook through the eyes or links E of the parts to be connected and to be gradually compressed during its advance. As the blank B is advanced through the mouth 61 at the end of the channel 19 the lobes 62 and 63 further compress the blank to form a closed link or jump ring R. The C-shaped contour of the blank B, together with the form of the channel 19 and the curved end 64 of the driver 26, cooperate to reshape the blank, during its movement through the channel 19, to the circular form illustrated in Fig. 9. A preferred embodiment of the implement having been described in detail its mode of operation is explained as follows:

To adapt the magazine core 36 to be supplied with blanks B the pusher plate 53 is slid upwardly on the legs 49 and 50 of the U-shaped frame 47 against the action of the springs 55 until it clears the end of the core, after which the frame is swung on its pivots 51 to the position shown in Fig. 4. A carrier P holding a supply of C-shaped blanks B is then placed over the reduced end 46 of the core 36, as indicated by dash lines in Fig. 4, and the blanks slid onto the latter. The frame 47 is then rocked back into parallel relation to the core 36 and the aperture 54 in the pusher 53 is aligned with the end of the core. Upon release of the pusher 53 the springs 55 on the legs 49 and 50 of the frame 47 will expand to slide the plate on the core to feed the blanks B toward the opening 43 in the upper plate 15 of the head 14 and the foremost blank into the channel 19 in front of the driver 26, see Figs. 6 and 7.

The implement is then in condition to be operated to apply a jump ring to connect the links E of separate sections of a chain or the like. To this end the links E of the chain sections or the loops or eyes of spangles to be connected are

placed on the opposite jaws 22 and 23 of the head 14 of the implement in the manner illustrated in Fig. 7. The handle 9 is then pressed toward the handle 4 to cause it to rock on its pivot-stud 7 from the position illustrated in Fig. 2 to that illustrated in Fig. 3. The rocking movement of the handle 9, operating through the pin 32 thereon and slot 33 in the oscillating lever 29, will rock the latter on its pivot pin 30 to cause the slot 31 at its opposite end to slide on the pin 27 on the driver 26 to actuate the latter to the position illustrated in Fig. 3. Actuation of the driver 26 forces the C-shaped blank B through the channel 19 to cause its ends to hook through the links E of the parts to be connected as illustrated in Fig. 8. During the advancement of the C-shaped blank the tapered sides of the channel 19 formed by the edges of the strips 17 and 18 cause a slight compression and reshaping of the blank B. During the further advance of the blank B from the position illustrated in Fig. 8 to that illustrated in Fig. 9 under the action of the driver 26 the blank is further compressed as it moves between the inwardly extending lobes 62 and 63 at the mouth 61 of the head 14 until its ends abut to form a closed link. The lobes 62 and 63 at the mouth 61 of the channel 19 also resist the outward movement of the blank B causing it to be reshaped by the circular end 64 of the driver 26 and the curved sides of the lobes to form a closed link or jump ring R as illustrated in Fig. 9. Thus, the movement of the blank C by the driver 26 causes its ends to loop through the links E to be joined and to be simultaneously compressed and reshaped to form a circular closed link R connecting separate chain sections or other parts.

At the completion of the jump ring applying operation the handle 9 is released and rocked back to its initial position illustrated in Fig. 2 by the hairpin spring 10 acting between the arm 3 of the supporting plate 2 and the handle. Rocking movement of the handle 9 by the spring 10 causes the pin 32 thereon to slide in the slot 33 in the oscillating lever 29 to rock the latter from the position illustrated in Fig. 3 to that illustrated in Fig. 2, and the slot 31 at the opposite end of the lever acting on the pin 27 on the driver 26 returns the latter to a position at the rear of the magazine core 36. The pusher 53 will then advance another blank C into the channel 19 in front of the curved end 64 of the driver 26. The implement may be successively operated in the manner explained above until the entire supply of blanks B is exhausted. It will be understood that the implement may be operated while held in one hand so that one of the jaws 23 may be inserted in a link E of one part to be connected while another part may be held by the operator's other hand to position its eye or link E either on the opposite jaw 22 or between the jaws.

It will be observed from the foregoing that the present invention provides a method of and implement for applying jump rings by advancing C-shaped blanks to cause their ends to hook through the parts to be connected and simultaneously compressed and reshaped to form a closed circular link. It will also be observed that the present invention provides an implement having novel features of construction and adapted for economical manufacture.

While an implement of preferred construction for carrying out the steps of the method is herein described and illustrated, it will be understood that modifications may be made in both the

method and the structure and arrangement of the parts of the implement without departing from the spirit or scope of the invention. Therefore, without limiting myself in this respect, I claim:

1. The method of forming a jump ring or the like which comprises providing an open C-shaped blank and forcing the blank through a continuously converging channel of a contour to cause the blank to be compressed and reshaped during its movement therethrough until its ends abut to form a closed ring.

2. The method of connecting the links of chain sections or the like with a jump ring which comprises providing an open blank of generally C-shaped contour, placing the links to be connected adjacent each other, and advancing the blank to cause its ends to hook through the links to be connected while simultaneously compressing and reshaping the blank until its ends abut to form a closed ring.

3. The method of connecting the links of chain sections or the like with a jump ring which comprises providing a blank of generally C-shaped contour, placing the links to be connected adjacent each other, and forcing the blank through a restricted opening of such contour as to cause its ends to hook through the links to be connected and thereafter the blank to be compressed until its ends abut and the blank to be reshaped to a circular configuration to form a closed ring.

4. In a device of the type indicated, a head having a guiding channel therein adapted to receive a blank of generally C-shaped contour, said guiding channel having gradually converging side walls with inwardly projecting lobes adjacent the end of the channel forming a restricted mouth of such contour as to reshape the C-shaped blank to circular configuration, and a driver for forcing the blank through the channel and restricted mouth to cause it to be compressed until its ends abut to form a closed ring.

5. In a device of the type indicated, a head having a guiding channel therein adapted to receive blanks of generally C-shaped contour, said channel having inwardly projecting lobes at its sides adjacent the end thereof forming a restricted mouth and the sides of the channel and lobes converging from the width of the blank to the width of the link to be formed, and a driver having its end curved to the contour of the link to be formed and reciprocable in said channel to force the blank through the channel and out from its restricted mouth, the converging sides of the channel and curved end of the driver co-operating to compress the blank until its ends abut and reshape the blank to circular configuration to provide a closed ring.

6. In a device of the type indicated, a head having a channel therein with inwardly projecting lobes adjacent one end forming a restricted mouth, the sides of the head adjacent the restricted mouth being tapered and the end of the head recessed to provide jaws at the sides of the restricted mouth adapted to receive the links of the parts to be connected, and a driver for forcing a blank of generally C-shaped contour through the channel and restricted mouth whereby to compress the blank until its ends abut to form a closed link.

7. In a device of the type indicated, a head having opposed plates with strips therebetween at opposite sides to provide a channel therein, the opposed plates being recessed at one end to provide spaced jaws and the inner edges of the

strips forming the side walls of the channel having converging lobes forming a restricted mouth, and a driver slidable in the channel for forcing a blank of generally C-shaped contour through the channel and out of the restricted mouth whereby to compress and reshape the blank to circular configuration until its ends abut to form a closed ring.

8. In a device of the type indicated, a head having opposed plates with strips therebetween at its opposite sides to provide a channel therein, the plates being recessed at one end to provide spaced jaws and the inner edges of the strips forming the side walls of the channel gradually converging and having inwardly projecting lobes forming a restricted mouth adjacent the ends of the jaws, and a driver slidable in the channel and having a curved end for forcing a blank of generally C-shaped contour through the channel and out of its restricted mouth whereby to gradually compress and reform the blank to circular configuration to provide a closed ring.

9. In a device of the type indicated, a head having a channel therein, a magazine core projecting from the head for supporting a supply of blanks thereon, a frame pivotally mounted on the head to adapt it to swing from a position parallel with the magazine core to a position in angular relation thereto, a pusher slidable on the frame and along the magazine core, resilient means on the frame for sliding the pusher therealong to advance the blanks thereon toward the head, and a driver slidable in the channel for forcing a blank advanced by the pusher through the channel.

10. In a device of the type indicated, a head having a channel therein, a magazine core projecting from the head for supporting a supply of blanks thereon, a U-shaped frame having the ends of its legs pivotally connected to the head to adapt it to be swung to a position adjacent the magazine core or to a position in angular relation thereto, a pusher slidable on the legs of the frame, springs for sliding the pusher to feed the blanks along the core and into the channel in the head, and a driver slidable in the channel to force the blanks through the channel.

11. In a device of the type indicated, a head having a channel therein with a restricted mouth adjacent one end, means on the head for feeding blanks of generally C-shaped contour to the channel, a driver slidable in the channel for forcing the blanks through the channel and out of the restricted mouth to compress and reshape the blanks to form closed circular jump rings, and a pair of relatively movable handles for reciprocating the driver in the channel in the head.

12. In a device of the type indicated, a head having a channel therein, a pair of relatively movable handles, means on the head for feeding blanks to the channel, a driver in said channel, a lever pivoted at one end and connected to the driver at its opposite end, and means pivotally connecting one of the handles and lever adjacent its pivotal mounting whereby compression of the handles operating through the lever will actuate the driver to force the blanks through the channel.

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