Sept. 16, 1941. E. L. MORROW 2,256,265

HAND OPERATED LINKING CONNECTOR

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Fig. 1

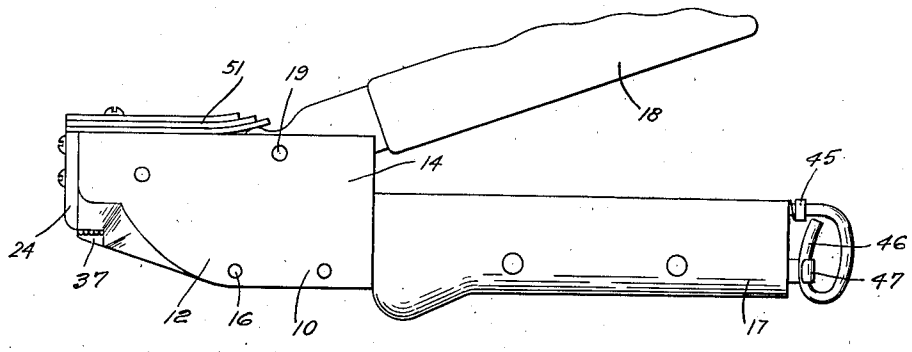


Fig. 2

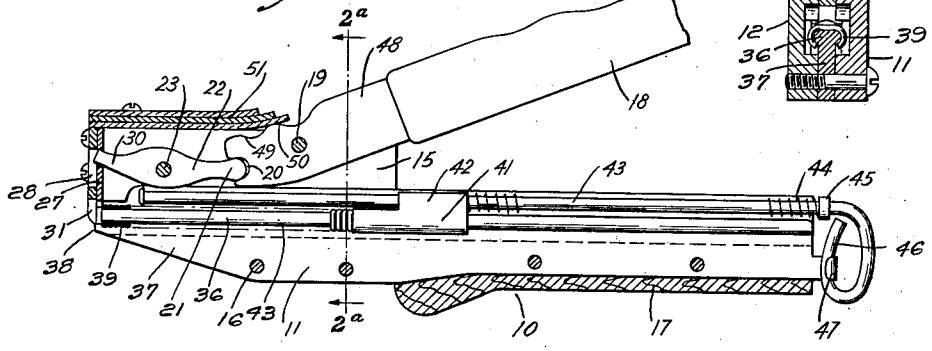


Fig. 2a

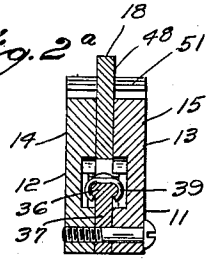


Fig. 3

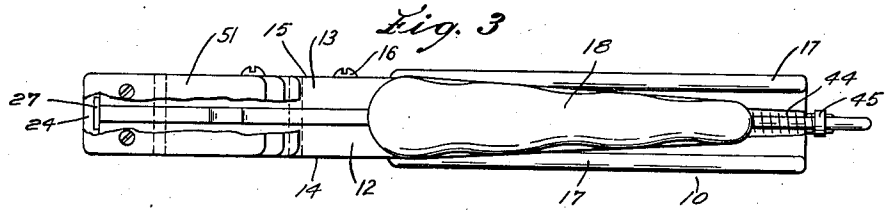


Fig. 4

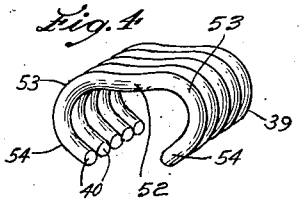
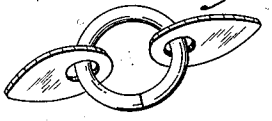


Fig. 5



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HAND OPERATED LINKING CONNECTOR

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Fig. 6

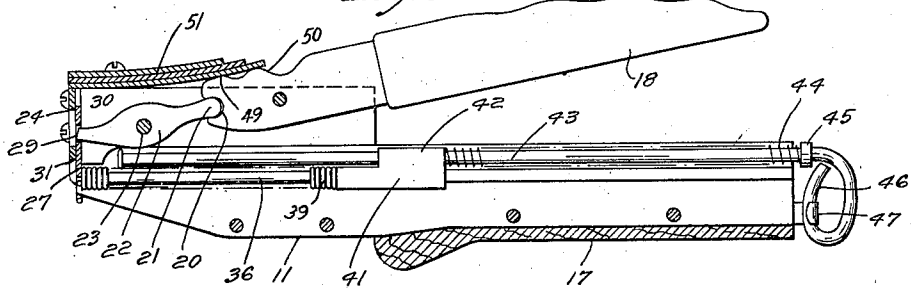


Fig. 7

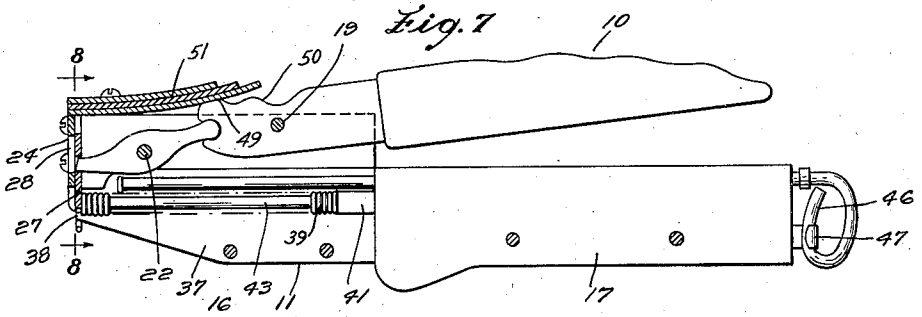


Fig. 8

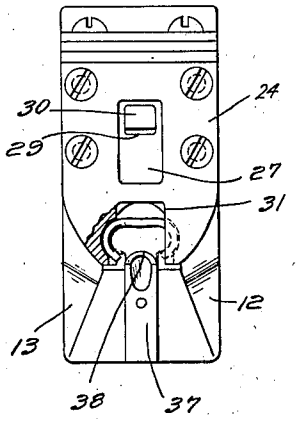


Fig. 9

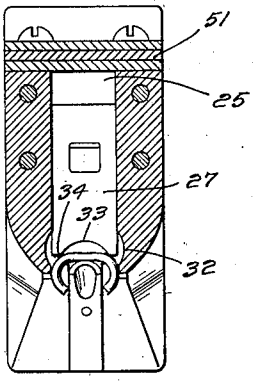


Fig. 10

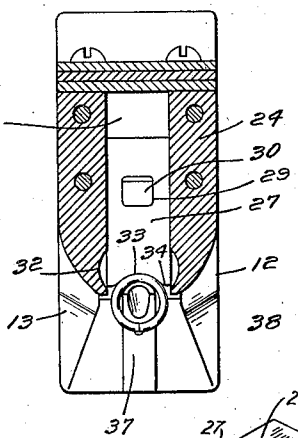


Fig. 11

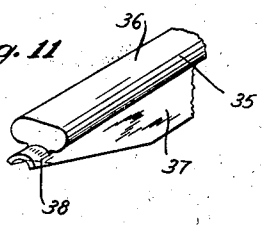


Fig. 12

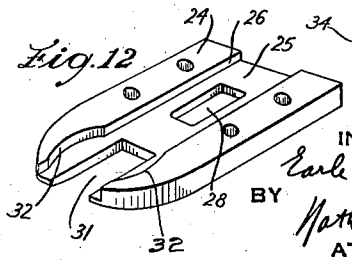
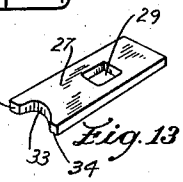


Fig. 13



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HAND OPERATED LINKING CONNECTOR

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Application December 2, 1940, Serial No. 368,185

8 Claims. (Cl. 59—1)

My present invention relates to a hand operated linking connector for joining articles with connecting links.

It is the principal object of my invention to provide a simple and inexpensive linking connector for use in linking articles of jewelry and the like, which utilizes open connecting links in strip form.

Another object of my invention is to provide a linking connector which successively removes open links from a link strip, positions the open links to permit linking of articles thereto, and then closes the open links.

Still another object of my invention is to provide an inexpensive linking connector which bends open links around a fixed anvil to close the links.

With the above and other objects and advantageous features in view, my invention consists in a novel arrangement of parts more fully disclosed in the detailed description following, in conjunction with the accompanying drawings, and more specifically defined in the claims appended thereto.

In the drawings:

Fig. 1 is a side elevation of the novel connector;

Fig. 2 is a central vertical section therethrough, the parts being in link shearing position;

Fig. 2*a* is a section taken on line 2*a*—2*a* on Fig. 2;

Fig. 3 is a top view thereof, parts being broken away;

Fig. 4 is a perspective view of a part of the link strip;

Fig. 5 is a perspective view of a closed link;

Fig. 6 is a view similar to Fig. 2, the parts being in link holding position;

Fig. 7 is a view similar to Fig. 6, the parts being in link closing position;

Fig. 8 is an enlarged detail view of the connector head of Fig. 2;

Figs. 9, 10 are enlarged detail views of the connector heads of Figs. 6 and 7, the plunger support being broken away;

Fig. 11 is a perspective view of the link track and anvil;

Fig. 12 is a perspective view of the plunger support; and

Fig. 13 is a perspective view of the associated plunger.

It has been found desirable, particularly in the jewelry trade, to provide a hand operated link connector which utilizes connector links in strip form. Since the connection of jewelry ornaments precludes the use of a back pressure die, I have devised a simple and inexpensive connector which positions open links about a fixed anvil to receive articles to be linked, and then bends the open link sides to close the links.

Referring to the drawings, the novel connector 10 comprises an elongated base 11 having two spaced portions 12, 13 which extend upwardly at the head end to provide sides 14, 15 which form a housing for the link operating mechanism, the portions 12, 13 being secured together in any suitable manner, as by screws 16, and having a U-shaped cover plate 17 shaped to form a bottom hand grip which cooperates with a hand lever 18 pivoted between the sides 14, 15 at 19. The lever 18 has a forward slot or recess 20 of arcuate form, in which the rear curved end 21 of a plunger lever 22 is mounted, the plunger being also pivoted between the sides 14, 15 at 23.

Referring now to Figs. 1 and 12 a plunger support 24 is secured to the forward end of the connector, and has a recess 25 with sides 26 which form guide tracks for a plunger 27, the support having an elongated slot 28 and the plunger a smaller slot 29 through which the forward end 30 of the lever 22 extends. The support also has a lower slot 31 in which a fixed anvil, hereinafter described, which is preferably resiliently fixed in the base to permit slight movement under excessive pressure of the plunger on the links, is positioned, and arcuate tracks 32 which act as link guides, the plunger being provided with an arcuate link engaging saddle 33 having spaced shoulders 34.

A link carrier 35, see Fig. 11, has a generally elliptical upper ridge 36 and a depending skirt 37 which is received between and secured to the spaced base portions 12, 13, the skirt 37 being undercut and terminating in a curved anvil 38 which as shown in Fig. 11 projects beyond the link carrying ridge 36, to be positioned within the plunger support slot 31, as best shown in Figs. 8, 9 and 10, the plunger 27 being positioned above the anvil as illustrated, with the saddle 33 towards the anvil.

A strip of connecting links 39, consisting of a plurality of adjacent links 40 which may be integrally connected at selected points or may be locked together with frangible adhesive or the like, is mounted on the carrier ridge 36 from the rear end thereof, a follower 41 being provided which is also mounted on the ridge and has an upper portion 42 bored or shaped to receive a longitudinal rod 43, a coil spring 44 extending between the upper portion 42 and an

abutment 45 to resiliently press the strip forwardly to position the end link between the guides 32 of the plunger support. The end 46 of the rod 43 is bent to releasably seat in a hook 47 provided at the rear end of the carrier skirt 37.

Referring now to Fig. 2, the forward end 48 of the lever 18 has a forward cam hump 49 and a rear cam hump 50 which is resiliently engaged by a leaf spring 51, secured to the sides 14, 15, as hereinafter explained. The open links 40, see Fig. 4, each has a central bridge 52, which may be inwardly curved if desired, and two end portions 53 which curve to form two spaced arms 54, preferably of arcuate form.

The operation of the hand link connector may now be explained. The parts being assembled as illustrated in the drawings, the link follower has moved the link strip to position the end link in the plunger support between the guides 32, see Figs. 2 and 8. In this position, the upper handle 18 being as illustrated in Fig. 1, the plunger 27 is in its upper position, with the shoulders 34 just above the bridge ends 53 of the link; and the leaf spring 51 contacts the rear cam hump 50 of the forward end of the handle 18 as shown.

An initial downward movement of the handle 18 engages the plunger with the end link and severs it from the strip, moving it down to contact the bridge with the anvil, see Fig. 9, the ends of the guides 32 slightly pressing the spaced arms of the link towards each other to keep it properly gripped and aligned. In this position the leaf spring 51 engages the forward cam hump 49, see Fig. 6, and the free open ends of the link may be threaded through two articles to be connected. In view of the engagement of the spring with the hump 49, the fulcrum distance of the lever is shifted so that a slightly greater pressure is necessary to move the handle 18. This enables the operator to "feel" the point at which to stop and thread the articles to be linked.

A further downward movement of the handle 18, see Fig. 7, presses the plunger further, and the shoulders 34 cooperate with the anvil, see Fig. 10, to close the open ends of the link, see Fig. 5, which may then be removed through the slot 31. Opening movement of the handle 18, which is accomplished by the leaf spring and which may be aided by other spring means, if desired, lifts the plunger and permits the spring pressed follower to position the next open link between the guides 32.

If the link material tends to be resilient so that the links gap after completion, it is merely necessary to adjust the stroke of the plunger so that it will pass slightly beyond the point necessary to close the link. This "overclosing" of the link will ensure a tightly closed completed link in the finished product.

The above described connector is simple to manufacture and to assemble, and may be readily changed to use any size or shape of link, either from strip form, as illustrated, or from a magazine, or as separate, individual links. Any other desired changes in size, shape, and operation may be made to suit the requirements for different connections, without departing from the spirit and the scope of the invention as defined in the appended claims.

I claim:

1. In a hand operated connector, a frame having a plunger slot, a plunger slidably mounted therein, a fixed anvil positioned in said slot, means for successively feeding open links each having a bridge and two open arms to said slot in position to be engaged by said plunger, manually operated means for moving said plunger to move an open link and contact the bridge thereof with said anvil, means for positioning said open link to receive articles to be connected, and means for continuing movement of said plunger to close said link.

2. In a hand operated connector, a frame having a plunger slot, a plunger slidably mounted therein, a fixed anvil positioned in said slot, means for successively feeding open links each having a bridge and two open arms to said slot in position to be engaged by said plunger, manually operated means for moving said plunger to move an open link and contact the bridge thereof with said anvil, and means comprising resilient spring means and a cooperating cam for positioning said open link to receive articles to be connected, and means for continuing movement of said plunger to close said link.

3. In a hand operated connector, a frame having a plunger slot, a plunger slidably mounted therein, a fixed anvil resiliently positioned in said slot, means for successively feeding open links each having a bridge and two open arms to said slot in position to be engaged by said plunger, manually operated means for moving said plunger to move an open link and contact the bridge thereof with said anvil, means for positioning said open link to receive articles to be connected, and means for continuing movement of said plunger to close said link.

4. In a hand operated connector, a frame having a plunger slot, a plunger slidably mounted therein, a fixed anvil resiliently positioned in said slot, means for successively feeding open links each having a bridge and two open arms to said slot in position to be engaged by said plunger, manually operated means for moving said plunger to move an open link and contact the bridge thereof with said anvil, means comprising resilient spring means and a cooperating cam for positioning said open link to receive articles to be connected, and means for continuing movement of said plunger to close said link.

5. In a hand operated connector, a frame having a plunger slot, a plunger slidably mounted therein, a fixed anvil positioned in said slot, means for successively feeding open links each having a bridge and two open arms to said slot in position to be engaged by said plunger, manually operated means for moving said plunger to move an open link and contact the bridge thereof with said anvil, said plunger having shoulders engaging the end portion of said bridge, and means to continue movement of said plunger, whereby said shoulders swing said bridge end portions around said anvil to close the link.

6. In a hand operated connector, a frame having a plunger slot, a plunger slidably mounted therein, a fixed anvil positioned in said slot, means for successively feeding open links each having a bridge and two open arms to said slot in position to be engaged by said plunger, manually operated means for moving said plunger to move an open link and contact the bridge thereof with said anvil, said plunger having shoulders engaging the end portion of said bridge, means comprising resilient spring means and a cooperating cam for positioning said open link to receive articles to be connected, and means to continue movement of said plunger, whereby said shoulders swing said bridge end portions around said anvil to close the link.

7. In a hand operated connector, a frame having a plunger slot, a plunger slidably mounted therein, a fixed anvil resiliently positioned in said slot, means for successively feeding open links each having a bridge and two open arms to said slot in position to be engaged by said plunger, manually operated means for moving said plunger to move an open link and contact the bridge thereof with said anvil, said plunger having shoulders engaging the end portion of said bridge, and means to continue movement of said plunger, whereby said shoulders swing said bridge end portions around said anvil to close the link.

8. In a hand operated connector, a frame having a plunger slot, a plunger slidably mounted therein, a fixed anvil resiliently positioned in said slot, means for successively feeding open links each having a bridge and two open arms to said slot in position to be engaged by said plunger, manually operated means for moving said plunger to move an open link and contact the bridge thereof with said anvil, said plunger having shoulders engaging the end portion of said bridge, means comprising resilient spring means and a cooperating cam for positioning said open link to receive articles to be connected, and means to continue movement of said plunger, whereby said shoulders swing said bridge end portions around said anvil to close the link.

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