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J. F. HAMLIN ET AL  
RIVET AND MANDREL ASSEMBLY  
Original Filed Feb. 1, 1956

2,930,503

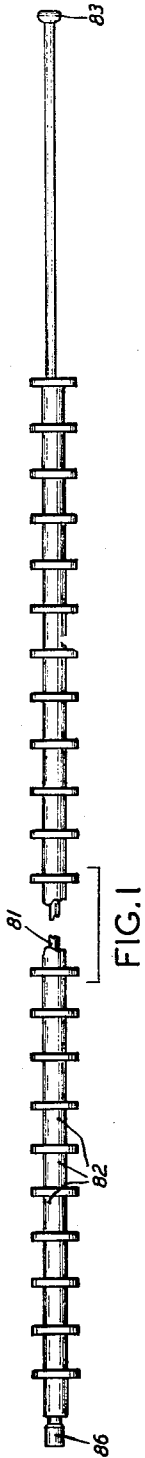


FIG. 1

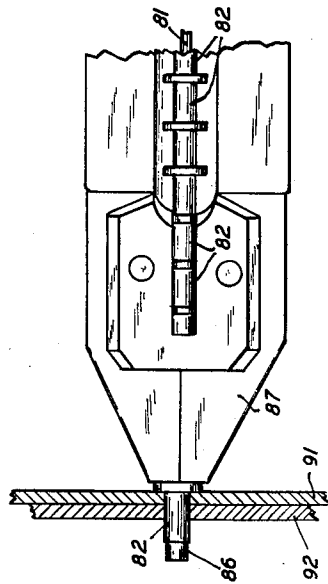


FIG. 2

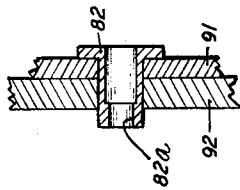


FIG. 3

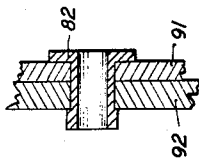


FIG. 4

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**RIVET AND MANDREL ASSEMBLY**

Jerry Fred Hamlin, San Rafael, and Louis Newman, Oakland, Calif., assignors, by mesne assignments, of one-sixth to Jerry F. Hamlin, one-sixth to Ralph M. Cuykendall, one-sixth to Marie Cuykendall, and one-sixth to Bess E. Hamlin, all of San Francisco, Calif., and one-sixth to Louise Newman and one-sixth to Louis Newman, both of Oakland, Calif.

Original application February 1, 1956, Serial No. 562,793. Divided and this application April 21, 1958, Serial No. 729,632

2 Claims. (Cl. 218—28)

The present invention relates to a rivet and mandrel assembly for riveting guns for blind rivets, and is particularly adapted for employment in a gun which is an improvement on the structure shown in Hamlin Patent No. 2,570,801, issued October 9, 1951. More particularly the invention concerns a rivet and mandrel assembly for riveting gun of the above character which assembly facilitates easy handling and loading of the rivets. This application is a division of our copending application Serial No. 562,793, filed February 1, 1956.

The principal object of this invention is to provide a rivet and mandrel assembly for a riveting gun which handles a plurality of rivets, in which assembly a plurality of rivets is strung on a mandrel in series relation and retained thereon so that the plurality can be easily inserted into the gun.

Another object of the invention is to provide an article of commerce in the form of a rivet and mandrel assembly including means forming a permanent part of the mandrel for holding a series of rivets on the mandrel.

Other objects and advantages of the invention will be apparent from the following description of a preferred embodiment, taken in connection with the accompanying drawings, in which:

Figure 1 is a plan view of a rivet and mandrel assembly in accordance with the present invention;

Figure 2 is a fragmentary plan view of the jaw end of a riveting tool showing a rivet in position to have the head of the mandrel pulled therethrough to expand the rivet;

Figure 3 is a sectional view through a rivet and plates to be fastened thereby; and

Figure 4 is an enlarged sectional view similar to Fig. 3 showing the rivet in place after having been expanded.

In certain types of blind riveting operations, it is customary to insert a rivet of the hollow type through a pair of sheet members to be riveted together, and then expand the rivet by drawing an enlarged head therethrough so that the blind end of the rivet is expanded to secure the members together. In this type of operation it is extremely desirable that the rivets be easily handled and be loaded easily into the gun employed to install and expand the rivets.

In accordance with the present invention and cooperating with a rivet gun and adapted to be installed therein, there is provided a rivet assembly including a wire or mandrel 81 having a series of hollow rivets 82 freely slidable thereon and having a rivet retaining shape forming a permanent part of the mandrel such as an integral upset portion 83 at one end thereof. At its other end the mandrel 81 has a head 86 joined to the body of the mandrel by tapered or cam portion which is of a dimension to retain the rivets 82 on the mandrel and increases

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toward the head end of the mandrel so it can be pulled through the rivets on the mandrel one at a time. The rivets 82 have their shank portions directed toward the cam portion of the head 86 of the mandrel 81 so that their heads are directed toward the rivet retaining portion 83. Since the rivet retaining portion 83 and head 86 of the mandrel are permanent parts of the mandrel, the mandrel 81 is not ordinarily reused and the material of such mandrel need be of substantially no greater durability than that necessary to serve to expand the set of rivets 82 strung on the mandrel.

Figure 2 shows the head or jaw end 87 of a riveting gun and in such figure the shank of a rivet has been inserted into aligned apertures in two adjacent members 91 and 92 which are to be riveted together. The riveting gun will not be further described and it will be understood that operation of such gun will pull the mandrel 81 to the right in Figure 2 so that the tapered cam portion of the head 86 of the rivet holding mandrel or wire 81 is drawn through the rivet and upsets or expands the rivet. Referring to Figure 3, it will be noted that before expanding the rivet 82 has two internal diameters, the larger diameter being of a size to cause the desired expansion within the members 91 and 92. The smaller internal diameter of the rivet provides material at 82a for upsetting into overlapping relation with the member 92. Figure 4 shows an enlarged view of a rivet 82 when expanded or upset in the riveting operation.

While we have shown and described a preferred embodiment of the invention, it will be apparent that the invention is capable of variation and modification from the form shown so that the scope thereof should be limited only by the scope of the claims appended hereto.

We claim:

1. An article of commerce comprising a unitary assembly of an elongated mandrel and a plurality of hollow rivets, said mandrel having a body portion, an enlarged head at one end of said body portion, and a tapered rivet expanding cam portion rearwardly of said enlarged head and joining said enlarged head to said body portion, a set of a plurality of hollow rivets strung on said body portion and each rivet having a shank portion with a head at one end of said shank portion, said rivets being freely slidable on said body portion and having their shank portions directed toward said cam portion, said shank portions having an internal diameter less than the diameter of said enlarged head, said cam portion and enlarged head being capable of being pulled through each of said plurality of rivets one after the other to expand the shank of said rivets, said body portion having at its other end an enlarged rivet retaining portion, said enlarged rivet retaining portion being a permanent part of said mandrel and in conjunction with said enlarged head holding said rivets on said mandrel until said rivet expanding portion and enlarged head is pulled through said rivets, the material of said mandrel being of substantially no greater durability than that necessary to serve to expand the set of rivets strung on said mandrel.
2. The article of commerce defined in claim 1 in which said enlarged rivet retaining portion is an integral part of said mandrel.

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