

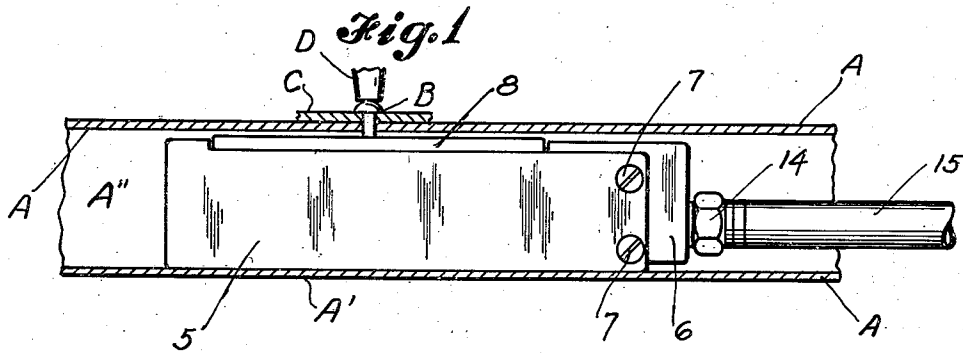
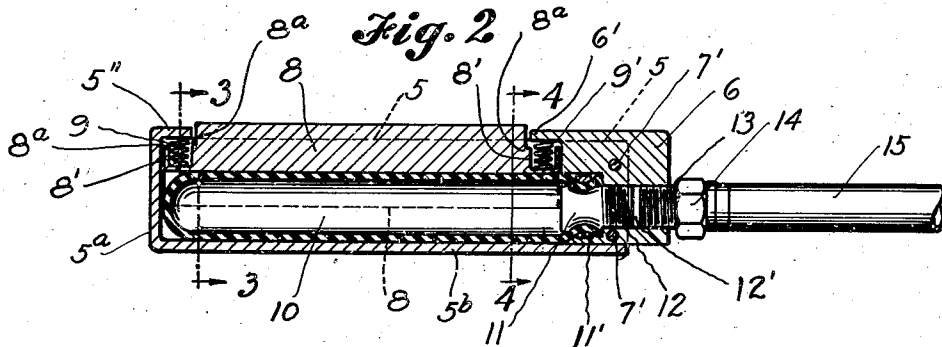
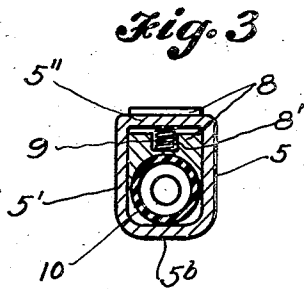
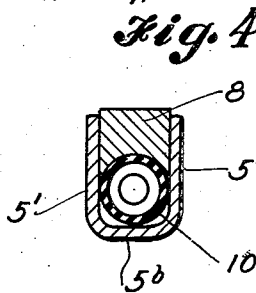
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BUCKING DEVICE

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2,396,413

BUCKING DEVICE

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2 Claims. (Cl. 78—53.5)

This invention relates to devices for clamping and for upsetting rivets in pipes and tubes, and particularly to pneumatically operated tools therefor.

In the operation of upsetting rivets through walls of tubes, in construction of the tubes or for connecting other tubes or parts thereto as in airplane construction it is necessary to provide some form of metal anvil sometimes called a "mouse," within the tube for binding against the inner ends of the rivets, while pressure or hammer blows are applied to the outer end of the rivets for upsetting the same, to bind the parts together. For this purpose various devices have been tried but they have been unsatisfactory, principally because the anvils have been backed or supported by other metal, and the blows of the riveting hammers have imparted through the rivets jars and vibrations on the anvil whereby the metal thereof is quickly crystalized and becomes broken or useless.

It is therefore among the objects of this invention to provide a bar with backing support of the bar to be pneumatically expanded against the bar, and the blows from hammers thereby absorbed or softened, and crystallization thereby prevented.

Another object is to provide such a tool provided with an adjustable anvil bar, with means for retracting the bar, to facilitate the entry and removal of the same into and from a pipe, with a pneumatic tube or bag for a cushion beneath the bar, and means for inflating the bag for extending the bar and supporting the same against rivets to be upset against the same.

Another object is to provide such a device with a bar or jaw adapted for clamping against various objects for binding the same in desired positions.

With these and other objects to be herein shown, I have illustratively exemplified my invention by the accompanying drawing of which:

Figure 1 is an elevation of the device positioned inside a tube or pipe A, beneath a rivet B, for a supporting clamp.

Figure 2 is a longitudinal section view, showing a rubber bag or tube positioned beneath the anvil bar with connections for inflation.

Figures 3 and 4 are cross section views, taken on lines, 3—3 and 4—4 of Figures 3 and 4 respectively.

Like numerals on the different figures represent like parts. The device comprises a frame or trough with sides 5 and 5' one end closed as 5a, a base 5b and a flange extended inward as 5'', all such portions being preferably integral for

low cost of manufacture. The opposite end of the trough is normally closed by a metal block 6, which carries a top flange 6' in line with the flange 5'' and at the opposite end of the open top of the frame. The block is provided with holes 7' for screws 7 through the side walls for binding the block in position.

A metal anvil or riveting bar or jaw 8 is adjustably disposed through the open area between the sides and ends, and carries shoulders 8a extending beneath the flanges, to prevent the total escape of the bar from the frame, and is provided with sockets 8' in which coil springs 9 and 9' are positioned with their upper ends bearing against the under sides of the flanges, whereby the bar is normally depressed so that its outer face is approximately even with the upper faces of the flanges, to facilitate the easy insertion of the device within any pipe or tube to be riveted, and to facilitate the removal of the device when the riveting is completed. The frame is thus integrally closed at one end and closed by the block 6 at the opposite end, the upper otherwise open top of the frame having end flanges 5'' and 6', the first integral with the frame and the last part of the block 6. These flanges overlie and are spaced from the sockets 8' to provide for the reception of the contractive coil springs 9 and 9', as clearly shown in Fig. 2.

The springs are completely housed against damage in the use and are readily withdrawn or replaced when necessary.

In order to extend or expand the anvil bar outward so that its outer face shall be in suitable position to bear against the end of any rivet to be set or upset, through the wall of the pipe, I provide an elastic bag or tube 10, preferably formed of rubber mounted in the trough beneath the anvil bar. One end of the bag is closed and the other is held open around a tubular nipple 11 and suitably clamped thereto as by a wre 11'. This nipple carries a thread 12 for meshing into the inner end of a threaded port 12' through the block 6, and a similar nipple 13 with a wrench nut 14 is threaded into the outer end of the port and carries on its outer end any suitable hose as 15 for conducting air or other fluid pressure for expanding the bag against the concaved under side of the anvil bar. This hose also provides a handle for positioning the device in any desired location in any tube or cavity where riveting is to be done, and for removing the tool when the work is completed. The side walls, base and ends of the trough provide a chamber for the bag and prevent the expansion thereof in any direction

except against the movable bar or jaw, and thus assure the projection of the jaw outward when the bag is expanded, for clamping by the jaw when the bag is inflated.

In use the outer face of the bar, is preferably formed flat, when required for operation adjacent a flat surface, and is preferably convex in form when required for use adjacent a concave surface. Before the device is inserted in the tube or cavity for riveting, the pressure is reduced in the bag, and the bar depressed by springs 9 and 9' so that its face is even with tops of the retaining flanges, and the tool may then be easily moved by the hose or handle into desired position abutting the ends of rivets to be set. The fluid pressure is then turned into the bag, for suitable expansion, and the bar extended thereby for backing against the rivets, and the hammer blows exerted against the outer ends of the rivets till suitably upset for connecting tubes or plates, etc. Where pneumatic hammers are in use, it is preferable to attach te supply hose to the same source of power, and the opposite pressures of the bar and hammers rapidly set the rivets as desired. The slight resiliency of the bag absorbs the shocks from the hammers and effectually prevents any crystalization of the bar.

Actual practice with this device has demonstrated that rivets may be upset thereby with far greater speed than with other known backing bars.

Although having described my invention as specifically applied to means for riveting inside of pipes or tubes, such description is for the purpose of illustrating one of the purposes for which

my invention is adapted for clamping purposes. The bottom 5^b of the frame being supported by the lower edge A' of the tube, the tube thus is a supporting back for the device, and the opposite movable member 8 may be properly described as a movable jaw for clamping against any other object, as well as the rivet.

Having described my invention, I claim as new:

1. A rivet buckler for application within a tubular body, including a frame open at one end and closed at the other, a block secured in and closing the open end, the closed end of the frame and the block being each formed with a flange, the flanges extending toward each other and overlying the otherwise open top of the frame, an anvil bar movable in the upper open end of the frame between the flanges, the ends of the anvil bar being formed with sockets underlying the flanges on the frame and block, retractive springs seated in said sockets and bearing against the overlying flanges, and expansible bag-like body in the frame underlying the anvil bar and contacting therewith, and means carried by the block to admit a fluid to expand the bag-like body and thereby exert pressure on the anvil bar to move the same above the top of the frame for use as an anvil, the springs acting to return the anvil bar to a position flush with the flanges in the absence of a bag pressure thereon.

2. A construction as defined in claim 1, wherein the anvil bar is formed at its ends with outstanding shoulders to engage the flanges to prevent undue outward movement of the anvil bar relative to the frame.

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