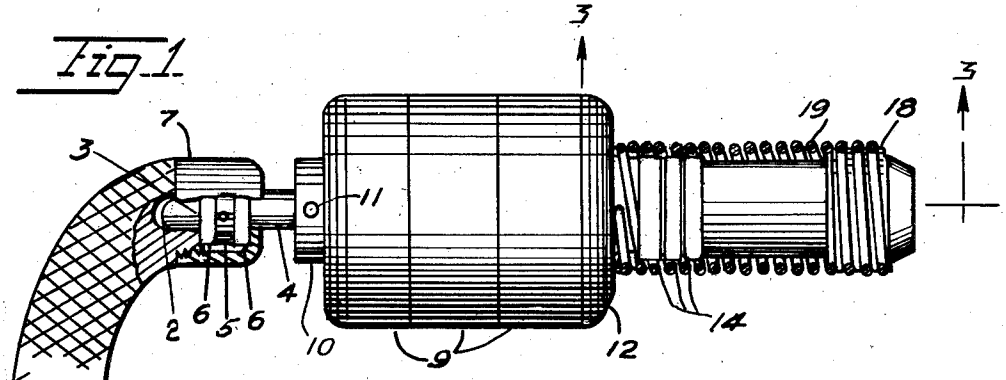
March 18, 1947. J. E. HEWES 2,417,490

RIVET BUCKING BAR

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Fig. 1.



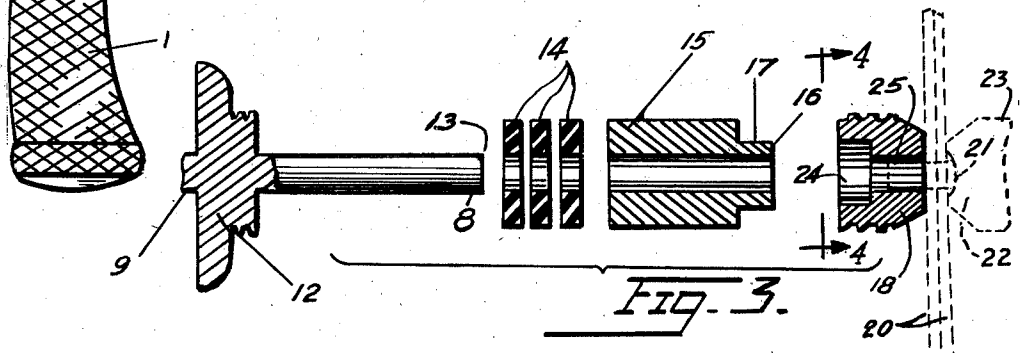


Fig. 3.

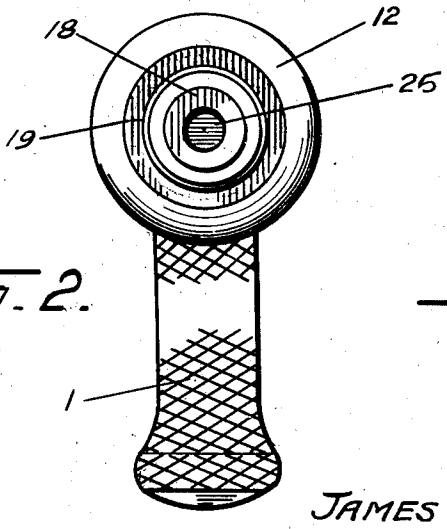


Fig. 2.

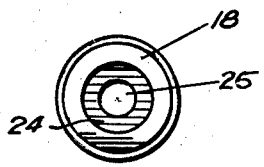


Fig. 4.

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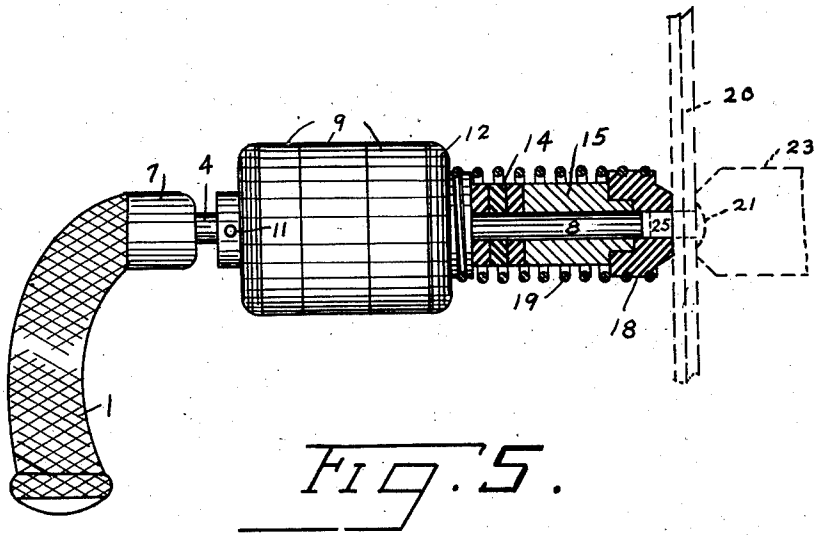


FIG. 5.

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2,417,490

RIVET BUCKING BAR

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5 Claims. (Cl. 78—53.5)

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This invention refers to riveting and more particularly to rivet bucking bars used in connection therewith. It has amongst its objects to provide a device of this nature that will be relatively easy to manipulate; that will be particularly suitable for "soft" riveting; that will do its work effectively; that will have an arrangement that will permit variation in the inertia weighting of the bar; that will have means for adjusting the amount of resiliency of the device, that will present an attractive appearance, and which can be used to pean over the rivet stem while the rivet hammer holds the head on the opposite side of the plates to be secured together by the finished rivet.

Other objects will become apparent as the invention is more fully set forth.

The conventional dolly bar is generally utilized for holding the head of a rivet while the hammer is striking the other end and forming it into another head. The weight of the bar is established and cannot be changed. This latter feature makes the use of the bar very tiresome and physically hard on the user. In this invention, the bar is termed a bucking bar because its action is somewhat different from that of the dolly bar. It is especially valuable for airplane riveting where the quarters are cramped and the rivets are hard to get to. It is provided with inertia weights or blocks that may be added or removed readily to vary the inertia of the device to suit the riveting to be done and make it easier for the user to hold. Also various resilient washers are arranged for to suit the size and length of the rivet and to control the size of the head developed by the bar. The device is held to the rivet to be headed by a rubberlike ferrule that spreads as the head is formed therein and its inner diameter moves out of the way so as to allow the rivet to fasten closely to the plates it is used to hold together.

In the following description is outlined a form of this invention as an example of its structure, reference being made to the attached drawings in which:

Figure 1 is a side view of a bucking bar embodying this invention, with portions broken away to show internal construction;

Figure 2 is a front end view of Figure 1;

Figure 3 is a longitudinal sectional view taken along the line 3—3 of Figure 1, and the parts separated to show method of assembly;

Figure 4 is a view taken along the line 4—4 of Figure 3; and

Figure 5 is a side view similar to Figure 1, but

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with parts of the rubber ferrule, shield and resilient washers broken away to show the positioning of the shank and rivet therein.

Similar reference characters refer to similar parts throughout the drawings.

In the drawings, a handle 1, is employed for the user to manipulate the device conveniently. It is preferably of pistol grip form provided with a recessed hole at 2 to receive the end portion 3 of the forming bar 4. The forming bar is provided with an adjustable collar 5 as indicated, to press up against the rubber washers 6, which take up the shocks given the bar while in use. A cap 7 screws on to the grip and covers the washers and supports the end 3 of bar 4. The shank 8 of the bar 4 is made long enough to take as many inertia weights 9 as the maximum use of the device requires. These inertia weights are longitudinally and loosely slid on the bar over the end 3, by removing the handle and adjustable collar 5. A collar 10 serves to hold the inertia weights together and is itself held to the bar by means of a set screw 11. An integral collar 12 on the bar prevents the inertia weights from advancing beyond it towards the impact head portion 13 of the forming bar. The latter is long enough to be conveniently applied to the rivets to be operated on. This portion is encompassed by resilient washers 14 adjacent to the collar 12, and by a hollow cylindrical shield 15, the front portion 16 of which is reduced to form an external surface and operating head 17 on which the recess 24 of a soft rubber ferrule 18 is slidably mounted, as shown in the drawings. This ferrule is additionally held in place on the forming bar and shield by a coiled spring 19, which spirally and flexibly screws on and attaches to the ferrule and fixed collar 12 and also forms a protective armor for the head of the tool. The phantom outline of the plates 20; rivet head 21; rivet set 22; and head 23 of a pneumatic hammer is shown in Figure 3 to illustrate the use of the tool.

In the operation of the device, the ferrule 18 is placed over the stem of the inserted rivet in the plates 20, as indicated in Figure 3. The hammer is started and hits against the head of the rivet. The bucking bar with its ferrule 18 over the stem of the rivet and its impact head 13 aligned therewith takes up the force reactively of the blows of the hammer, on the opposite sides of the plates 20 to be riveted together. This reaction compresses the rubber ferrule and brings the impact head 13 against the end of the rivet. The striking head 13 of the forming bar, backed

up by the inertia of the weights 9 resists the action. This flattens the rivet out as the sides of same come into contact with the internal surface 25 of the ferrule 18 and spreads same outwardly in a resilient manner and so controls the work that it forms the rivet end into an even cylindrical shape. The jar on the forming bar passes through the forming bar after the inertia is overcome and is taken up by the rubber washers 6, so that the operator's hand can absorb it gradually. The vibrations occurring in the plates and passing to the ferrule are also partially taken up by the resilient washers 14. The washers may be added to or removed to control the height of rivet head and prevent jarring of the machine excessively. The bucking bar is held by the handle with one hand of the user, while the other hand grasps the body at the inertia weights and directs it to the rivet. The curved and checkered form of the handle enable the tool to be held in the hand with the axis and direction of operation of the tool above, which permits the bucking bar to be manipulated thereby using the other hand for holding the inertia weights, as a kind of universal joint. The hold on the tool enables the latter to control the riveting reaction and forming to be controlled effectively by the hands of the operator. The tool is therefore easy on the operator to use, and affords proper contact with the rivet to give it the desired form and contact with the plates. The tool is particularly suitable for riveting light flat materials together, as its operation coordinates with their vibration. This makes it especially suitable for aeroplane work where aluminum or other light thin metallic material is used.

While but one general form of the invention is shown in the drawings and described in the specifications, it is not desired to limit this application for patent to this particular form or in any other way otherwise than limited by the scope thereof, as it is appreciated that other forms of construction could be made that would use the same principles and come within the scope of the appended claims.

Having thus described the invention, what is claimed is:

1. A bucking bar comprising in combination, a forming bar, inertia weights or blocks mounted on said bar for adjustably weighting the forming bar, a rubberlike ferrule structurally connected with the said bar adapted for mounting over a rivet shank in a plate and acting as guide for the forming bar end portion to align therewith, said ferrule being compressed and reduced in height so as to allow the said operating head of the forming bar to impact the rivet and form a head thereon close to the plate and spread the ferrule to permit it, when the rivet is hammered on from the other side of the plate, means on the forming bar for adjusting the position of weights longitudinally thereon adjacent the middle of the bar and its axis so as to be in the direct line of the hammering and the number of weights or blocks in accordance with the amount of inertia to be applied thereon.

2. A bucking bar comprising in combination, a forming bar, inertia weights or blocks for adjustably weighting the forming bar, a rubberlike ferrule structurally connected with the said bar adapted for mounting over a rivet shank in a plate and acting as guide for the forming bar end portion to align therewith, said ferrule being compressed and reduced in height so as to allow the said operating head of the forming bar to impact the rivet and form a head thereon close to the plate and spread the ferrule to permit it, when the rivet is hammered on from the other side of the plate, means on the forming bar for adjusting the position of weights longitudinally thereon adjacent the middle of the bar and its axis so as to be in the direct line of the hammering and the number of weights or blocks in accordance with the amount of inertia to be applied thereon, a pistol grip handle for the forming bar and resilient members in the handle for taking up vibration in the forming bar.

3. In combination with a rivet hammer holding a rivet head in a plate, a bucking bar comprising, a forming bar having one end portion carrying a collar thereon and the other end portion formed as an impact head with the intermediate portion arranged as a weight shank, a handle arranged to receive one end portion of the forming bar therein and holding same resiliently thereto, a washer slidable on the shank with a set screw for locking same in any position thereon, inertia weights or inertia blocks slidably mounted on the said bar, or blocks for placement on the shank adjacent the middle portion thereof longitudinally thereon about the axis thereof and to be held by the said washer, a fixed washer on the shank acting as a stop against the inertia weights or blocks and acting in conjunction with the first mentioned washer to hold the weights in between on the shank, resilient washers on the shank disposed against the fixed washer, a shield on the bar mountably pressing against the washers, a ferrule of rubberlike material on the shield projecting in front thereof for placement on the rivet and adapted for movement back towards the forming bar so same can impact the rivet during operation of the hammer and form a head on the rivet against a plate to be riveted and on the opposite side thereof to that which the rivet hammer is used with the said bar.

4. In combination with a rivet hammer holding a rivet head in a plate, a bucking bar comprising, a forming bar having one end portion carrying a collar thereon and the other end portion formed as an impact head with the intermediate portion arranged as a weight shank, a handle arranged to receive the end portion of the forming bar therein and holding same resiliently thereto, a washer slidable on the shank with a set screw for locking same in any position thereon, inertia weights for placement on the shank adjacent the middle portion thereof longitudinally thereon about the axis thereof and to be held by the said washer, a fixed washer on the shank acting as a stop against the inertia weights and acting in conjunction with the first mentioned washer to hold the weights in between on the shank, resilient washers on the shank disposed against the fixed washer, a shield on the shaft against the washers, a ferrule of rubberlike material on the shield projecting in front thereof for placement on the rivet, and adapted for movement back towards the forming bar so same can impact the rivet during operation of the hammer, a coiled spring for holding the ferrule in place against the shield and aligned therewith, and a resilient member between the forming bar and handle for absorbing shocks from the forming bar when it impacts the rivet operated on by the hammer and form a head on the rivet against a plate to be riveted and on the opposite side thereof to that which the rivet hammer is used with the said bar.

5. A bucking bar of the class described comprising in combination, a forming bar having an integral collar thereon adjacent its middle portion with an impact head portion extending from one side and a handle receiving portion on the other side, adjustable inertia weight means mounted on the said forming bar against the said collar and on the handle receiving portion so as to form a relatively large cylindrical body thereon for manual holding, a handle adjacent the end of the handle receiving portion, said handle being of curved form disposed at right angle to the axis of the forming bar, a shield mounted and slidable on the said impact head portion, a spring element mounted on the integral collar and extending and surrounding over the said shield and beyond same, a ferrule for positioning over a rivet stem, of resilient material mounted on the end portion of the shield and also held by the spring element said ferrule having a passage therethrough for the impact head to pass through and resiliently allow the impact head to contact a rivet stem therein to spread the same into a head when the normal head of the rivet is struck by a riveting hammer.

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