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BEADING TOOL FOR BOILER TUBES AND THE LIKE.

APPLICATION FILED JULY 14, 1917.

1,283,799. Patented Nov. 5, 1918.

Fig. 1.

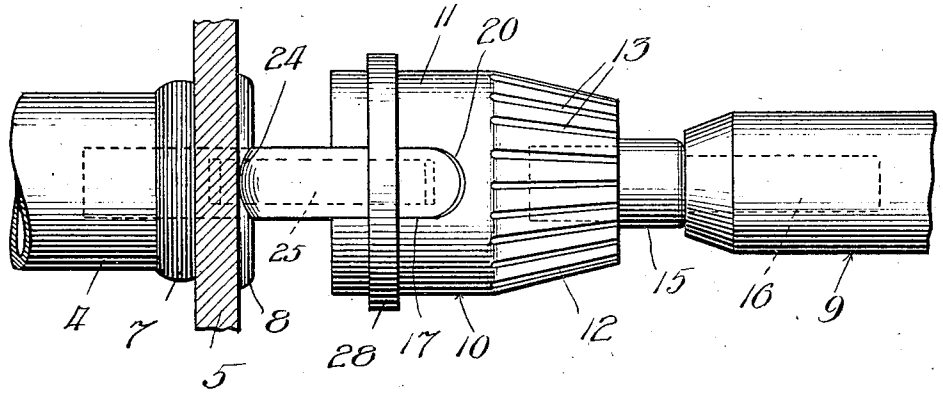
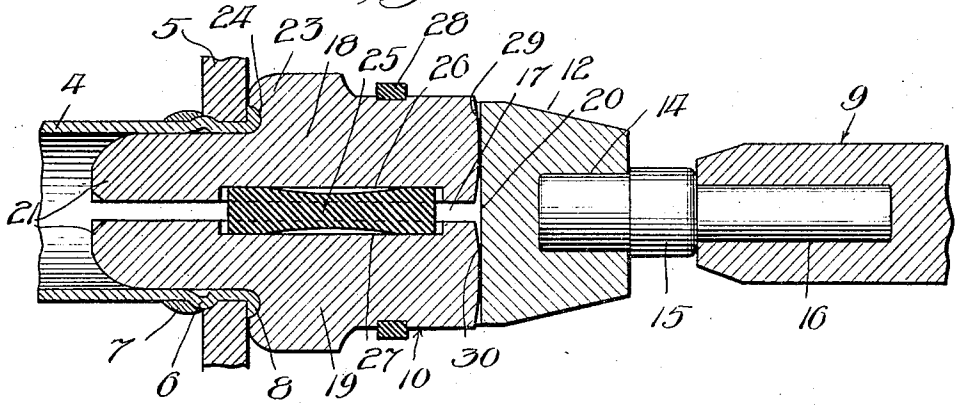


Fig. 2.



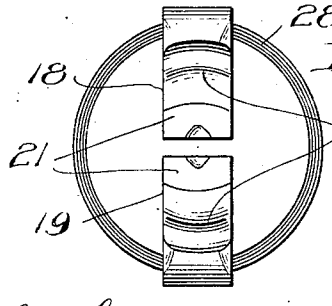


Fig. 3.

Witness:
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

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BEADING-TOOL FOR BOILER-TUBES AND THE LIKE.

1,283,799. Specification of Letters Patent. Patented Nov. 5, 1918.

Application filed July 14, 1917. Serial No. 180,616.

To all whom it may concern:

Be it known that I, WILLIAM KERR, a citizen of the United States, residing at Clinton, county of Clinton, and State of Iowa, have invented certain new and useful Improvements in Beading-Tools for Boiler-Tubes and the like, of which the following is a specification.

The present invention has to do with improvements in tools for beading boiler tubes into place. The boiler tubes are beaded or curled over on their protruding ends, where they project through the head sheets, and the tool to which the present invention relates is intended for performing this service.

More particularly the device of the present invention is intended for performing this class of service by the use of a pneumatic hammer or the like, although it will presently appear that any suitable hammer or other similar instrumentality may be used for delivering the impacts.

Devices of this kind have been produced in the past, but ordinarily they have been open to the objection that they operated on only one side of the tube periphery, thus delivering an unequal impact and making it difficult to secure a perfectly even and uniform bead around the entire periphery of the tube.

One of the objects of the present invention is to provide a beading tool which will overcome the objections just above mentioned so as to give a perfectly uniform and even bead with a minimum amount of labor and care on the part of the operator.

Other objects and uses of the invention will appear from a detailed description of the same which consists in the features of construction and combinations of parts hereinafter described and claimed.

In the drawing:

Figure 1 shows a side elevation of the beading tool as applied to the end of a tube, and in said figure the tube is shown in position in the boiler head sheet;

Fig. 2 shows a longitudinal section through the beading tool, and is a section taken at right angles to the elevation shown in Fig. 1; and

Fig. 3 shows an end view of the beading tool.

For purposes of convenience in illustration and description, I have shown the manner of application of the beading tool to a boiler tube, and for similar reason I have also shown the boiler tube as applied to one of the head sheets of the boiler. The tube is designated by the numeral 4 and the head sheet by the numeral 5. It is customary to form a bead 6 on the tube just inside of the head sheet, a copper gasket or band 7 being frequently provided for insuring a steam-tight joint, and one which will be tight at all times regardless of expansion and contraction. The bead 8 is to be formed on the extreme end of the tube by flanging or beading the same over against the outer surface of the head sheet. The function of the tool to which the present invention relates is to form this bead 8. I have shown the tool as being applied to a pneumatic hammer or riveter 9 as a simple means of supplying the necessary impacts. It is to be understood, however, that any other suitable tool may be provided for delivering the impacts to the beading tool.

Nevertheless the present beading tool is peculiarly well adapted and designed for use in connection with a pneumatic hammer or riveter.

The beading tool comprises a body portion 10, the center portion 11 of which is of cylindrical form and one end portion of which is tapered or coned. This tapered portion 12 is provided with a series of ribs or corrugations 13 which facilitate the holding of the beading tool in the hand of the operator.

The member 10 is provided in its end portion with a socket or recess 14 which receives one end of a pin 15. The other end of the pin seats into the socket or recess 16 which is ordinarily provided in the end portion of the pneumatic tool.

In the other end of the member 10 there is formed a transverse slot or recess 17 within which are mounted a pair of wing dies 18 and 19. The floor 20 of the slot 17 may be rounded as shown in Fig. 1, so as to reduce the amount of wear to a minimum.

Each wing die 18 and 19 has a tongue 21 which sets into the end of the tube 4, the ends of said tongues being rounded, as shown in Fig. 2, and the sides of the tongue being also rounded as shown at 22 in Fig. 3, so as to conform approximately to the contour of the inner surface of the tube 4.

On the side portion of each of the wings

18 and 19 is a lug 23 having a die surface 24 of proper contour to give the desired form to the end of the tube. When the tongues 21 lie against the inner surface of the tube 4, as shown in Fig. 2, the lugs 23 are so positioned that their die surfaces 24 will correctly form the bead on the protruding end of the tube. As shown in Fig. 2, the die surfaces 24 are curved in a direction transverse to the length of the wings 18 and 19, so that as the beading tool is turned around with the pneumatic hammer in operation, the material of the tube will be gradually forced down and worked into the form of the bead.

It is very desirable to retain the wings 18 and 19 in flexible engagement with the interior of the tube 4. For this purpose, I have provided resilient means for spreading the wings apart in such a manner that they will naturally or normally assume the best and most desirable position to perform their work. A convenient form of such resilient means is a block or shoe of rubber or the like 25 seated into the recesses 26 and 27 in the wings 18 and 19 respectively. The central portion of this block of rubber is tapered or cut away as shown in Fig. 2, leaving its end portions of full width, so that they will bear firmly against the floors of the recesses 26 and 27. Consequently, the wings 18 and 19 will be spread apart under resilient pressure. In order to hold the wings in place within the slot 17, I have illustrated a rubber band or the like 28 encircling the block 10 and seated into a recess in said block, said band engaging the wings 18 and 19 at the points where it passes the slot 17. This band 28 is set back far enough with respect to the rubber block 25 to give a resultant force tending to spread apart the tongues of the wings 18 and 19 so as to hold the said tongues firmly in engagement with the inner surface of the tube 4. The rubber band 28 also serves to retain the wings in position within the slot 17 when the beading tool is removed from the boiler tube.

As the beading tool is set into and withdrawn from the boiler tube the wings will rock back and forth. A certain amount of such movement will also take place during the normal operation of the device, and, furthermore, the wings will adjust themselves to the correct distances apart depending upon the exact internal diameter of the boiler tube. In order to insure a satisfactory operation at all times I have formed the inner ends of the wings with the curved surfaces 29 and 30 shown in Fig. 2, so that the wings will rock on said surfaces and find even bearings at all times, regardless of their exact distances apart.

While I have herein shown and described only a single embodiment of the features of my invention, still I wish it clearly understood that I do limit myself to the said embodiment, except as I may limit myself in the claim.

I claim:

A beading tool for boiler tubes and the like, comprising in combination a body member of circular cross-section having on one end a central socket for the accommodation of a hammer pin or the like and having in its other end a transverse slot for the accommodation of a pair of flanging wings, and also having adjacent to said end a peripheral groove, a pair of flanging wings within said slot, each of said wings having an arcuate end portion for seating against the bottom of said transverse slot and also having a protruding working end portion adapted to project beyond said slot, central facing recesses on said wings, a block of resilient material seated within said recesses and between said wings, and of sufficient width to normally maintain said wings separated from each other, and thereby cause their edge portions to project beyond the outside face of the body portion, and a band of resilient material seated within the peripheral groove aforesaid and drawing the wings toward each other, all for the purpose specified.

WILLIAM KERR.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."