Nov. 25, 1924. 1,517,079

G. H. LANGTON

SWAGING TOOL

Filed Feb. 23, 1923

Fig. 1.

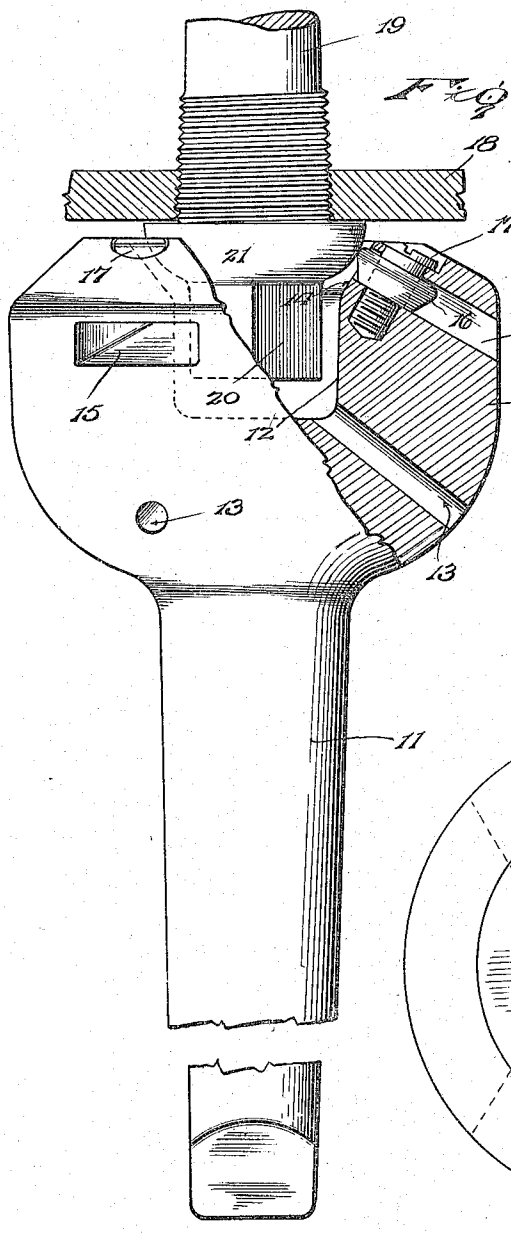


Fig. 3.

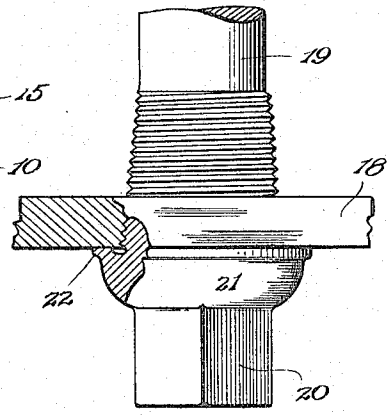
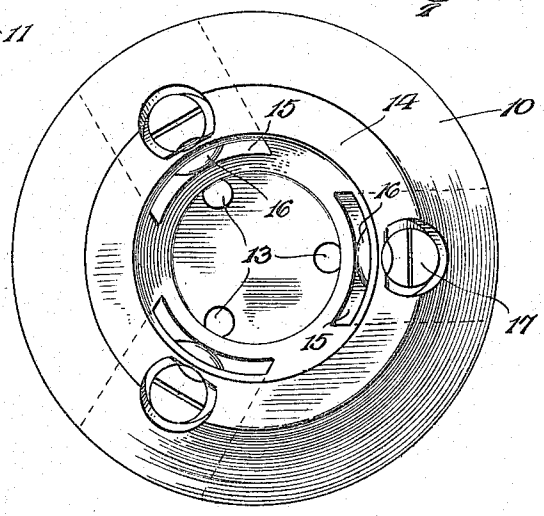


Fig. 2.



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UNITED STATES PATENT OFFICE.

GEORGE H. LANGTON, OF PRINCETON, WEST VIRGINIA.

SWAGING TOOL.

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To all whom it may concern:

Be it known that I, GEORGE H. LANGTON, citizen of the United States, residing at Princeton, in the county of Mercer and State of West Virginia, have invented certain new and useful Improvements in Swaging Tools, of which the following is a specification.

This invention relates to an improved bolt and rivet head swaging tool.

It sometimes happens, in the operation of a locomotive, that the water in the boiler is allowed to reach such a low level that the heads of the stay bolts of the crown sheet are drawn, by the heat in the firebox, away from said sheet with the result that leakage occurs around the bolts. This condition must, of course, be immediately corrected and, under present practice, the procedure not uncommonly followed is to manually mash or spread the head of each stay bolt by pounding thereon with a punch or the like until the peripheral margins of the bolt heads are swaged back into tight engagement with the sheet to form sealed joints between the bolt heads and the sheet. However, it very often happens that the necessary pounding against a bolt head serves to loosen the bolt in the crown sheet with the result that even though the margin of the head of the bolt is swaged into engagement with the sheet, leakage will, nevertheless, occur. The present invention, therefore, seeks to provide a tool which will overcome these difficulties and a tool which may be power driven for swaging the bolt heads into engagement with the sheet, thus not only effecting a better joint than heretofore between the bolt heads and the sheet but also accomplishing the work with rapidity.

In the drawings:

Figure 1 is an elevation showing my improved tool in use, parts being broken away and illustrated in section.

Figure 2 is a top plan view of the tool, and

Figure 3 is a detail view showing a bolt head after being operated upon by the tool.

In carrying the invention into effect, I employ a substantially hemi-spherical head 10 from which extends a longitudinally tapered shank 11 flattened at its outer end for engagement in the chuck of a suitable motor adapted to rotate the tool. The head 10 is provided with a central cylindrical recess 12 from the bottom of which leads a plurality of discharge passages 13 and, as will be observed, said recess is flared at its upper end to define a beveled face 14. Opening through said face into the recess is a plurality of radial slots 15 spaced at equi-distant points circumferentially of the head. As brought out in Figure 1, these slots are tilted with respect to the axis of the recess and inclined from their outer ends toward their inner ends toward the mouth of the recess, the slots opening through the periphery of the head. Freely mounted in the slots are frusto-conical rollers 16 which may be inserted in the slots at the outer ends thereof and journaling said rollers are cap screws 17 threaded into the head, the head being recessed to countersink the heads of said screws. Thus, the rollers may, should occasion demand, be readily renewed, and it is now to be noted that the larger ends of the rollers are presented toward the outer end of the recess 12 and project into said recess at the inner ends of the slots 15, the rollers being tilted with respect to the axis of the recess in conformity with the inclination of said slots. In the present instance, I have shown the head as provided with three of the slots 15 and, accordingly, with three of said rollers. However, the number of slots and rollers may, of course, be varied as found most expedient in the practical use of the tool.

In Figure 1 of the drawings, I have illustrated the manner in which the tool is employed to operate upon the head of a conventional locomotive boiler crown sheet stay bolt. The crown sheet is indicated at 18 and threaded through the sheet is the stay bolt 19 which is provided with the usual head 20 having a bell shaped base portion 21 which, under ordinary conditions, bears tightly against the sheet to form a sealed joint between the sheet and the bolt. However, this figure of the drawings illustrates the manner in which the base of the head is drawn away from the sheet by the heat in the firebox when the water level in the boiler is allowed to get too low, and the object sought is, after the joint is thus broken between the

bolt head and the crown sheet, to swage the head back into tight engagement with the sheet. To accomplish this result the tool is placed upon a suitable motor capable of rotating the tool, when the head of the tool is, as shown in Figure 1, fitted over the head of the bolt to engage the rollers 16 with the base portion 21 of the bolt, the bolt head being received in the recess 12. As will be seen, the rollers serve to center the tool with respect to the bolt head and since the rollers are tilted with respect to the axis of said recess, the rollers will engage the base portion of the bolt at the base ends of the rollers only, the taper of the rollers providing clearance between the rollers and the head of the bolt from the base ends of the rollers to the smaller ends thereof. The tool is then rotated and, at the same time, fed or advanced against the head of the bolt with the result that the rollers will be caused to swage the margin of the base of the bolt radially outward, as shown in Figure 3, to define an encircling flange, indicated at 22, which will be coincidently forced evenly against the sheet to again form a sealed joint between the bolt head and the sheet. As will be appreciated, the heads of the numerous stay bolts of the crown sheet of a locomotive boiler may, by the use of my improved tool, be readily swaged with a corresponding saving of time and labor and without loosening of the bolts.

Having thus described the invention, what is claimed as new is:

1. A swaging tool including a head provided at its forward end with an axial socket, and a plurality of tapered swaging rollers mounted upon the head outside of the periphery of said socket but projecting at their larger ends into the socket near the forward end thereof, the rollers having their axes converging in the direction of the inner end of the socket and having their smaller ends disposed outside of the periphery of the socket.

2. A swaging tool including a head provided at its forward end with an axial socket and formed in spaced relation to the forward end thereof with a plurality of spaced radial slots inclined toward their outer ends away from the forward end of the head, and a plurality of frusto-conical swaging rollers journaled in said slots to project at their larger ends into said socket, the rollers having their axes lying at an acute angle to the axis of the socket to converge toward the inner end of the socket and having their smaller ends disposed outside of the periphery of the socket.

In testimony whereof I affix my signature.

GEORGE H. LANGTON. [L. S.]