Feb. 13, 1951 H. STECKROTH 2,541,786

LAPPING DEVICE

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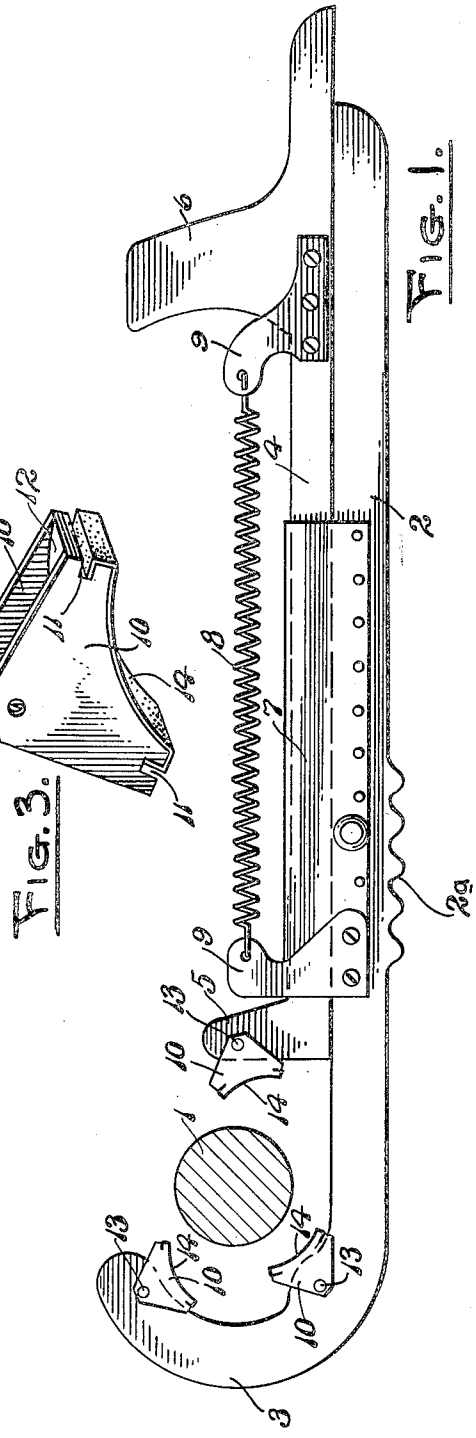


FIG. 1.

FIG. 3.

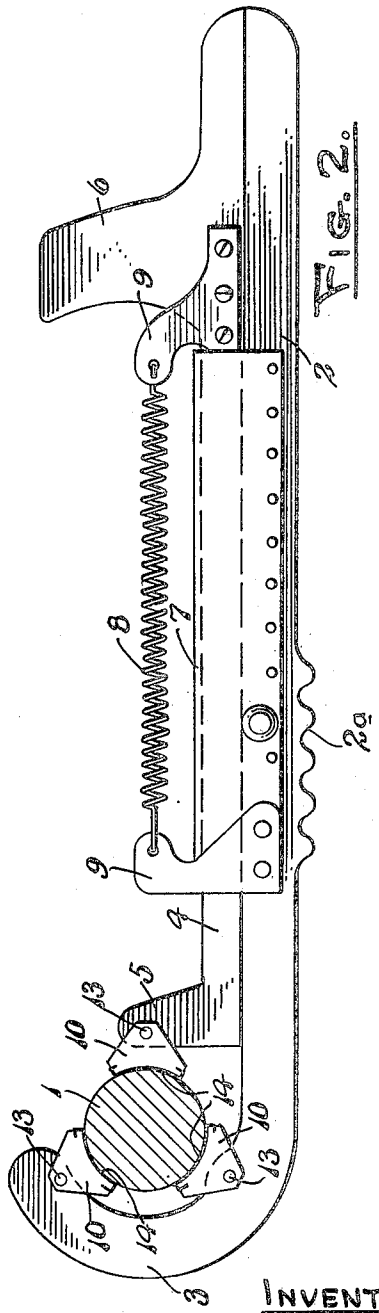


FIG. 2.

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LAPPING DEVICE

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1

This invention relates to a novel and practical lapping device, adapted to be used for lapping shafts which, after they have been machined as closely as may be by regular turning and similar methods, are finished by lapping as for example, when a shaft is to be fitted within a bearing and small amounts of metal at the exterior surface of the shaft need to be removed, such amounts being measured in minute fractions of an inch or fractions of a thousandth of an inch.

Lapping is ordinarily accomplished by means of movable application of an abrasive with pressure against a surface which is to be processed. The present invention has for its object and purpose a novel, practical and effective tool which may be handled by a workman for rapidly and accurately lapping a shaft or the like which, in a lathe and rotated between the head and tailstock thereof may be driven and rotated continuously and the lapping done on the moving surface of the shaft.

An understanding of the invention may be had from the following description, taken in connection with the accompanying drawing, in which,

Fig. 1 is a side elevation of the lapping tool of my invention, showing the tool in its retracted, inoperative position as it is being applied to a shaft, the shaft being in transverse cross section.

Fig. 2 is a similar section showing the position of the tool when lapping occurs and,

Fig. 3 is a somewhat enlarged perspective view of one of the lapping elements a number of which are located around and bear against a shaft which is processed.

Like reference characters refer to like parts in the different figures of the drawing.

The shaft 1 may be a metallic member, cylindrical in cross section which has been turned or otherwise machined substantially to size and which at its outer surface is to be subjected to the lapping operation which the tool I have invented is designed to expedite.

The tool includes an elongated bar 2 which, at one end, is curved upwardly in substantially the arc of a circle to form a curved arm 3 as shown. The under side of the bar 2, between its ends, is equipped with a series of transverse spaced ridges, and valleys between them, to aid in holding the tool when gripped by the hand. Above the bar 2 a second elongated bar 4 is slidably mounted, being located directly thereover. At its inner end and adjacent the arm 3 it is

2

formed with an upwardly extending lug or post 5, and adjacent the opposite end has an upwardly extending handle 6. The bar 4 is held in sliding relation to the lower bar 2, being guided in a sheet metal guide 7 of generally inverted U-form, the sides of which have a riveted or equivalent permanent connection to the bar 2. A coiled tension spring 8 has its opposite ends connected with two upwardly extending posts 9, one of which is permanently secured to the upper bar 4, near the handle 6, and the other to the bar 2 near the inner end of the guide 7. The normal effect of the spring is to move the bar 4 lengthwise of the lower bar 2 in a direction such that the lug 5 is moved toward the arm 3. But through grasping the handle 6 by one hand and holding the bar 2 and the guide 7 thereon by the other hand, the spring may be stretched and the upper bar 4 moved in the opposite direction as shown in Fig. 1.

Three lapping elements are shown as rockingly mounted, one on the lug 5 and the other two adjacent opposite ends of the curved arm 3 and at the inner sides thereof. Said lapping elements each consists of two spaced plates 10 of a generally triangular form, with slots 11 in the plates as shown and also in a curved shoe 12 which is located between and secured to the plates at curved edges thereof. Such plates 10 are spaced a sufficient distance that they may be located one at each side of the lug 5 and at each side of the arm 3, and have pivotal connection therewith as indicated at 13, with the concave sides of the shoes 12 of the three lapping elements thus mounted positioned so that when the bar 4 moves, under the influence of the spring 8, inwardly as shown in Fig. 2 the three concave sides of the shoes 12, which may be covered by emery cloth 14 or other lapping material used, fit snugly against the outer cylindrical surface of the shaft 1. The emery cloth or other equivalent abrasive material used has its ends received in the slots 11 and may be secured therein in any suitable manner.

In applying the tool to the shaft which is to be processed, the upper bar 4 is pulled back, as in Fig. 1, so that the tool may be moved to position it with the shaft 1 located between the several lapping elements. Then upon release of the handle 6, spring 8 moves the bar 4 and the lapping element carried by the post 5 thereon, until the abrasives, at 14 on the three lapping elements, engage the surface of the shaft substantially conforming thereto.

It is evident that under such conditions, and

with the force of spring 8 exerted, the outer surface of the shaft which is rotated about its longitudinal axis in a lathe or other similar machine is subjected to abrasive cutting so as to remove small portions of the outer surface of the shaft until it has reached a required accurate size. The tool may be moved back and forth lengthwise of the shaft for lapping either the shaft for its entire length or at selected portions in the length thereof.

For shafts of different diameters the lapping elements, one of which is shown in Fig. 3, will be of different dimensions to conform to the shafts which are to be processed.

The tool is of simple, but very practical and effective construction. It is easily operated, and lapping is accomplished with greater speed and expedition than heretofore, and with better results as to accuracy.

The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

I claim:

1. In a structure as described an elongated member having a laterally disposed curve section at one end thereof, a second elongated member located against a side of the first member, having an arm at an end spaced from the curved end section of the first member, means for slidably mounting said members for relative longitudinal movement of one with respect to the other, and abrasive carrying lapping elements rockably mounted on the first longitudinal member at its curved lateral extension and on the arm of the second member, said elements having outer sides of arcuate concave form, all of substantially the same radius of curvature, adapted to be positioned around a shaft located between said elements in spaced relation to each other around the shaft, between which shaft and the concave sides of said elements, abrasive is adapted to be located for lapping the shaft upon rotation thereof, with said lapping elements against the shaft surface, and yielding spring means between said elongated slidable members normally moving said members relative to each other to move said lapping elements toward each other, thereby adapting them to engage with yielding pressure against the surface of a shaft located between them.

2. A structure as defined in claim 1, and hand engageable means on said elongated slidable members for moving them in an opposite direction against said spring means to separate the lapping elements carried on one member from the other, thereby adapting said device for application to a shaft with the shaft located between the lapping elements.

3. In a device of the class described an elongated member having, at one end, a laterally extending arcuate terminal section, a pair of lapping elements mounted for rocking movement adjacent opposite ends of said arcuate section, and having concave sides of arcuate form and of substantially the same radius of curvature, a second elongated member located against a longitudinal side of said first member and at the same side of said first member as the arcuate extension thereof, a guide connected to the first member embracing the second member for slidably mounting the two members for relative longitudinal movement with respect to each other, a third lapping element of like structure as the first two lapping elements rockingly mounted on said second longitudinal member at one end thereof, with its arcuate side and the arcuate sides of the two first mentioned lapping members adapted to bear, at spaced distances from each other, against the outer surface of a cylindrical shaft, a coiled compression spring, and an arm connected to each of said longitudinal members to which the ends of said spring are attached for normally moving said longitudinal members slidably with respect to each other to yieldingly press said lapping members against a shaft between them.

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