Oct. 16, 1934. H. J. HOGUE 1,977,556

APPARATUS FOR FINISHING BOLT HEADS AND POINTS

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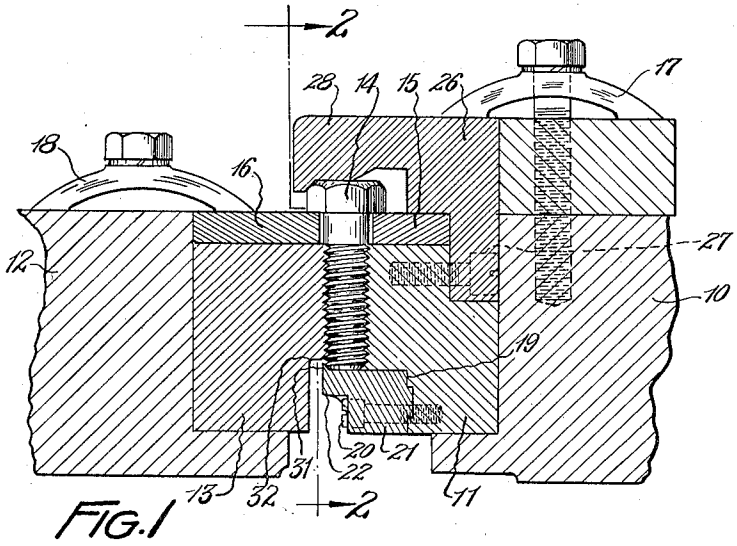


FIG. 1

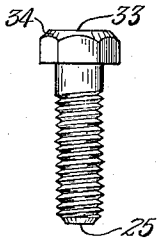


FIG. 4

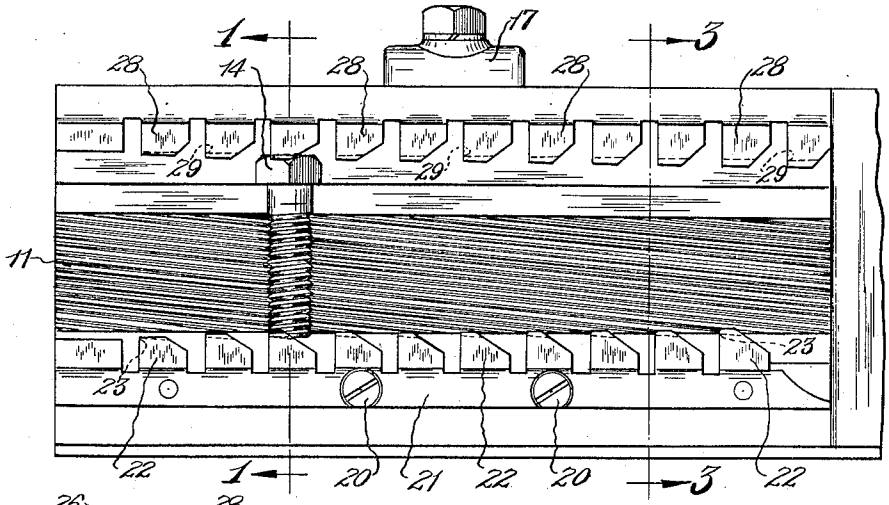


FIG. 2

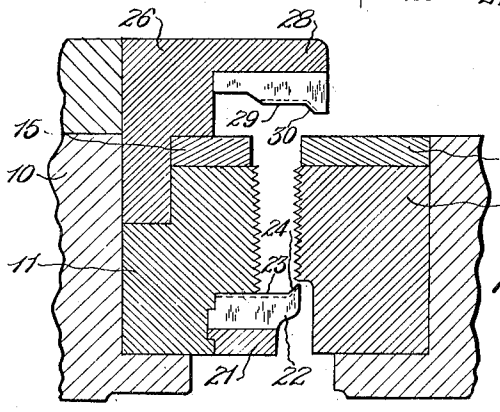


FIG. 3

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APPARATUS FOR FINISHING BOLT HEADS AND POINTS

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5 Claims. (Cl. 80—9)

This invention relates to thread-rolling machines for rolling threads on bolts, screws, etc. and, more particularly, the invention relates to a method and apparatus for finishing the ends of bolts simultaneously with the operation of rolling threads thereon.

According to the present methods of manufacturing bolts and screws, it is customary to finish the heads and to provide finished points on the bolts and screws as separate operations subsequent to the operation of rolling the threads. This involves additional cost, not only because of the additional operations, but also because of the additional handling of the product, the investment in special machines for finishing the heads and points, the additional floor space required by such machines, and the labor employed in the operation of such additional machines.

It is one of the objects of the invention to reduce the cost of manufacture of bolts and screws having either finished heads or points, or both, by performing these operations on the thread-rolling machine simultaneously with the operation of forming the threads, so that the bolts and screws, as they come from the thread-rolling machine, are substantially finished and require no further manufacturing operations.

Other objects of the invention and the features of novelty will be apparent from the following description, taken in connection with the accompanying drawing, of which

Figure 1 is a fragmentary section on the line 1—1 of Fig. 2, through the portion of an ordinary thread-rolling machine in which the thread-rolling dies are positioned, the cutters for finishing the opposite ends of the bolt being shown in their proper relation to the thread-rolling dies in accordance with this invention.

Fig. 2 is a side elevation of the stationary thread-rolling die shown in Fig. 1, the cutters for finishing the opposite ends of the bolt being also shown. This is a view illustrating the parts as they would appear from a plane represented by the line 2—2 of Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 2, and

Fig. 4 is a side elevation of a bolt as finished in accordance with this invention.

While I have not illustrated in the drawing a complete thread-rolling machine such as is commonly used in bolt manufacturing plants, I have illustrated such portions of the machine as will enable those skilled in the art to comprehend and practice the invention. In Fig. 1 there is illustrated at 10 the portion of the frame of an ordinary thread-rolling machine which carries the stationary thread-rolling die 11. At 12 there is illustrated the portion of the reciprocating slide which carries the movable thread-rolling die 13. A bolt 14 is shown in position between the dies 11 and 13 to have the threads rolled thereon. In this case only a portion of the shank of the bolt 14 is being threaded and, in accordance with the usual practice, the filler blocks 15 and 16 are arranged on the dies 11 and 13 respectively, to properly position the bolt in the dies, the under side of the head of the bolt engaging the upper sides of the blocks 15 and 16 in accordance with the usual practice. The usual clamps 17 and 18 are shown in connection with the parts 11 and 12 of the machine.

In practicing my invention I provide a recess 19 in the stationary die 11 and secure in this recess, by means of screws 20 or any other suitable manner, a bar 21 which carries a series of cutters 22, these cutters each having a cutting edge 23 which operates on the end of the bolt to face the same, and an inclined cutting edge 24 for chamfering the periphery so as to form a finished point on the bolt. The direction of movement of the bolt through the dies is indicated by the arrow that has been placed on the bolt in Fig. 2, and it will be noted that the cutting edges 23 and 24 of the series of cutters 22, are in a rising series of steps from left to right, or in the direction of movement of the bolt so that these cutters 22 will, as the bolt rotates in moving through the dies, progressively operate on the end of the bolt to form what is known in the trade as a finished point. While I have shown the cutters 22 as integral with the bar 21, and at right angles to the faces of the dies, it will be understood that these cutters may be separate pieces attached to the bar 21 and arranged at various angles as is common practice in milling cutters. It will also be understood that for convenience in illustrating the invention I have shown the cutters 22 as rather widely spaced but, in practice, the cutters will be narrower than illustrated and arranged more closely together so as to provide the maximum number of cutters and thus produce a finely finished point as illustrated at 25 in Fig. 4.

The same principle, as above described for finishing the points of the bolts, may be used for finishing the heads, and I have illustrated a bar 26 that is secured to the stationary die 11 by screws 27 or in any other suitable manner, and which has cutters 28 extending out over

the head of the bolt and formed with cutting edges 29 to finish the end surface of the head, and inclined cutting edges 30 for chamfering the head. These cutting edges 29 and 30 of the series of cutters 28 are arranged in a downwardly progressing series of steps so that the different cutters will operate on the head in succession and properly finish the latter. The spacing of the cutters 28 and the number of such cutters to be employed will be determined on the same basis as the spacing and number of cutters 22, as above described.

In the operation of the invention the bolt blanks will be fed between the dies, in the usual manner, entering at the left end of the stationary die, in Fig. 2. The reciprocating die 13 then moves forward and the bolt is rolled between the dies and discharged at the right end of Fig. 2. As the bolt rolls between the dies the threads are formed thereon and, simultaneously with the forming of the threads, the opposite ends of the bolt are faced and chamfered. In some cases it may only be desired to provide a finished point on the bolt and then the cutters 28 would be omitted and only the cutters 22 employed. If it were only desired to finish the head of the bolt, only the cutters 28 would be used and the cutters 22 would be omitted but, in any case, the bolt is to tightly gripped between the thread-rolling dies, that as it rolls past the cutters 22 and 28, the latter will operate thereon in the same way that a milling cutter operates.

As ordinarily constructed the faces of the dies 11 and 13, which form the threads on the bolt, are of the same depth but, in order to provide clearance for the lips 31 on the cutters 22, the movable die 13 is slightly relieved at 32 so that the face of this die will be of slightly less depth than the operating face of the stationary die 11. However, this in no wise interferes with the formation of perfect threads on the bolt at the end of the latter.

From Fig. 4 it will be noted that the action of the cutters 28 on the head of the bolt finishes the end 33 and provides the chamfer 34 so that, by the employment of this invention, either or both ends of the bolt may be faced and chamfered during the operation of rolling the threads and the bolt will be delivered from the thread-rolling machine in a finished condition.

While I have illustrated and described the principles of my invention and what I now consider to be the preferred means for practicing the same, it will be understood that various changes in the details may be made without departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, I claim:

1. In a bolt-finishing machine, in combination with a pair of thread-rolling dies, a series of cutters in fixed relation to one of said dies and to the path of movement of the bolt and having cutting edges extending transversely of the path of movement of the bolt across the end of the bolt and so spaced as to act separately and successively on the bolt, said cutters being in relatively stepped arrangement axially of the bolt for forming a finished surface on the end of the bolt normal to the bolt axis as the threads are being formed thereon.

2. In a bolt-finishing machine, in combination with a pair of thread-rolling dies, a series of cutters in fixed relation to one of said dies and to the path of movement of the bolt and having cutting edges extending transversely of the path of movement of the bolt and so spaced as to act separately and successively on the bolt, said cutters being in relatively stepped arrangement axially of the bolt for forming a finished surface on one end of the bolt normal to the bolt axis and chamfering the periphery of said end as the threads are being rolled thereon.

3. In a bolt-finishing machine, in combination with a pair of thread-rolling dies, a series of cutters spaced apart longitudinally of the path of movement of the bolt and in fixed relation to one of said dies and to the path of movement of the bolt, each of said cutters having its cutting edge extending transversely of the path of movement of the bolt and having two cutting edges in different planes for facing and chamfering the head of the bolt as the threads are being formed thereon, and the cutters of the series being in relatively stepped arrangement axially of the bolt.

4. In a bolt-finishing machine, in combination with a pair of thread-rolling dies, two series of cutters operating respectively on the opposite ends of the bolt to face and chamfer said ends as the threads are being formed, the cutters of each of said series each having cutting edges extending transversely of the path of movement of the bolt and in different planes and being in relatively stepped arrangement axially of the bolt.

5. In a bolt-finishing machine, in combination with a pair of thread-rolling dies, two series of cutters in fixed relation to one of said dies and operating respectively on the opposite ends of the bolt to face and chamfer said ends as the threads are being formed, the cutters of each of said series each having cutting edges extending transversely of the path of movement of the bolt and in different planes and in relatively stepped relation axially of the bolt.

HENRY J. HOGUE.