

Sept. 4, 1934.

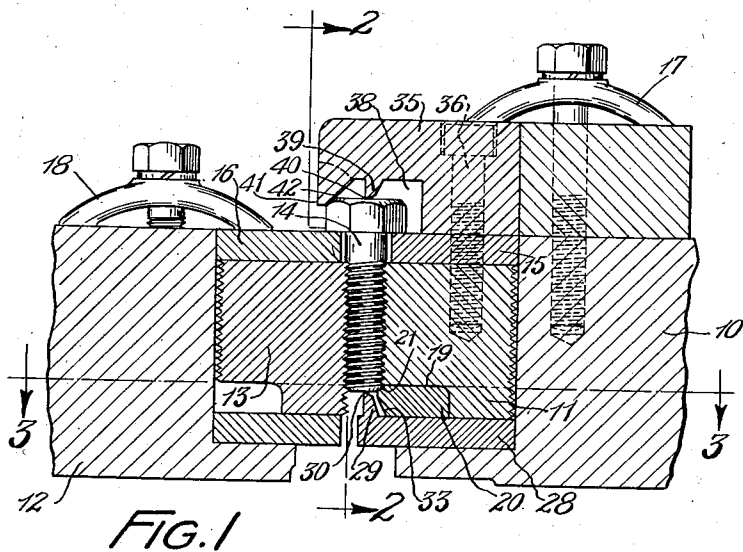
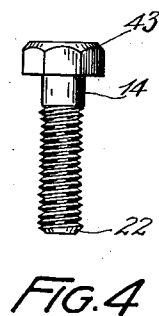
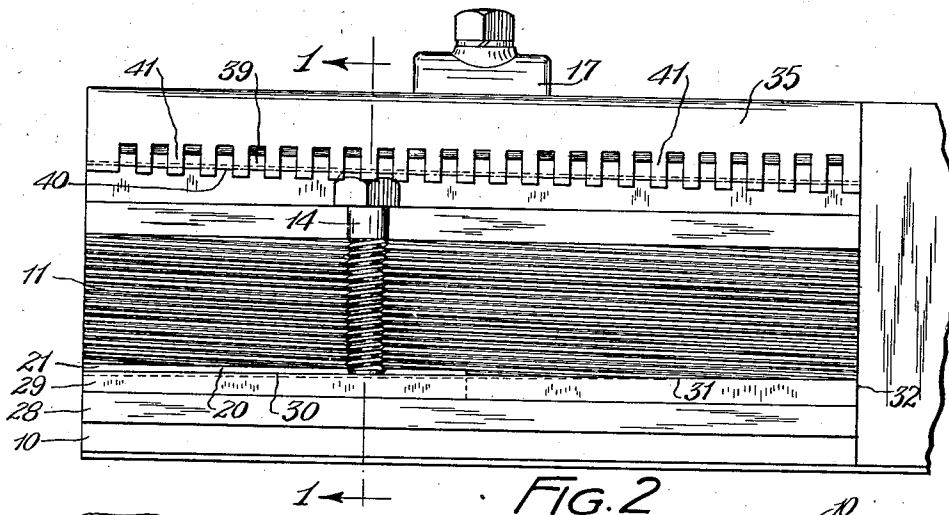
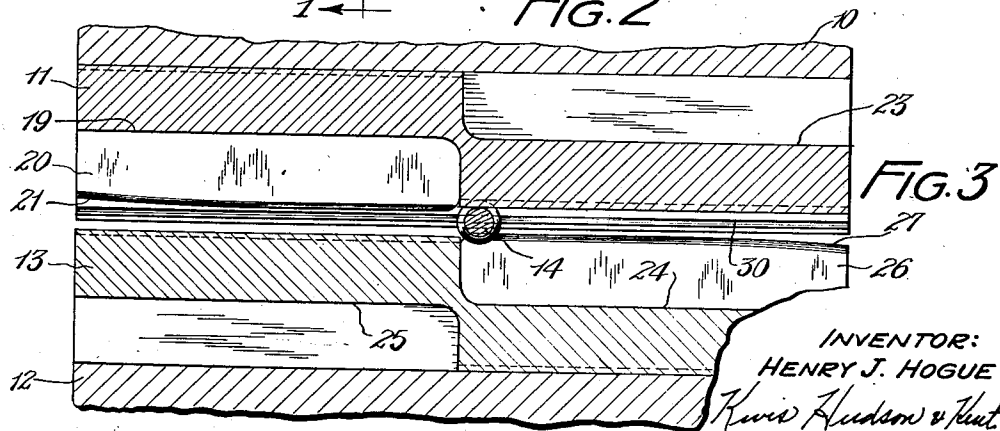
H. J. HOGUE

1,972,225

APPARATUS FOR FINISHING HEADS AND POINTS OF BOLTS

Filed Dec. 3, 1932

2 Sheets-Sheet 1



INVENTOR:
HENRY J. HOGUE
Kerr & Hudson v. Hunt
ATTORNEYS

Sept. 4, 1934.

H. J. HOGUE

1,972,225

APPARATUS FOR FINISHING HEADS AND POINTS OF BOLTS

Filed Dec. 3, 1932

2 Sheets-Sheet 2

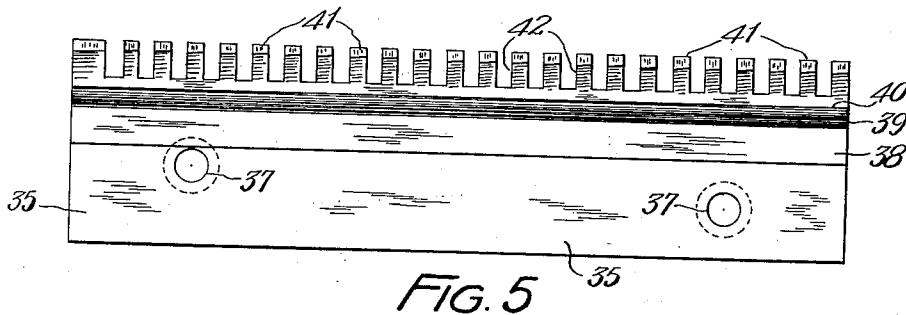


FIG. 5

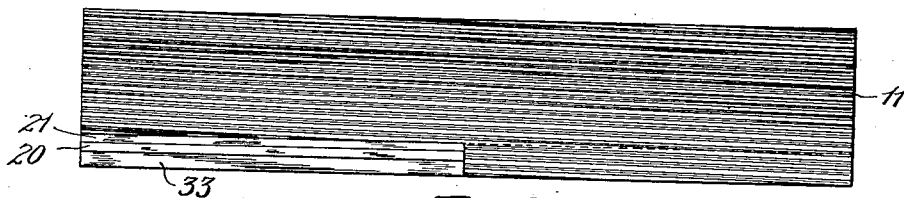


FIG. 6

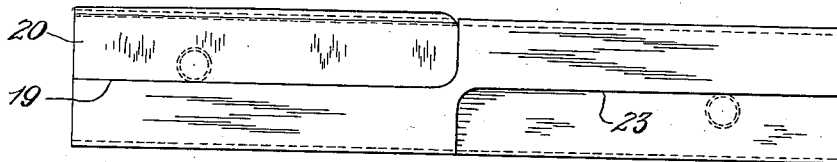


FIG. 7

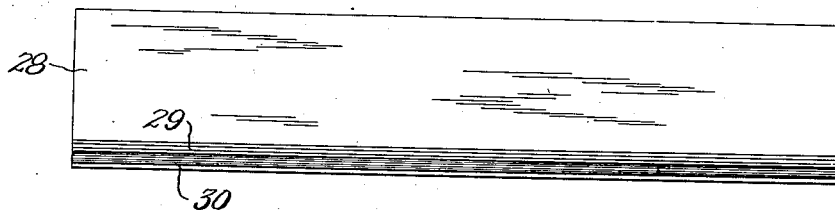


FIG. 8

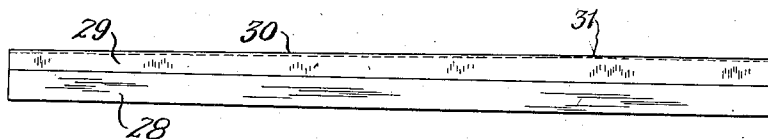


FIG. 9

INVENTOR:
HENRY J. HOGUE
Kenio Hudson & Hunt
ATTORNEYS

UNITED STATES PATENT OFFICE

1,972,225

APPARATUS FOR FINISHING HEADS AND
POINTS OF BOLTS

Henry J. Hogue, Lakewood, Ohio, assignor to
The Wasmer Bolt & Nut Company, Cleveland,
Ohio, a corporation of Ohio

Application December 3, 1932, Serial No. 645,544

10 Claims. (Cl. 80—8)

This invention relates to thread-rolling machines for rolling threads on bolts, screws, etc., and more particularly, the invention relates to apparatus for finishing the ends of bolts, screws, etc., simultaneously with the operation of rolling the threads. According to the present methods of manufacturing bolts and screws, it is customary, where the bolt or screw is to be provided with a finished point, or a finished head, to perform these finishing operations in machines that are separate and independent of the thread-rolling machine and to which the bolts and screws are fed before being threaded. These additional operations increase the cost of manufacture, not only because of the additional labor and overhead expense incident to the use of additional operations and machines, but also because of added expense for handling the product and carrying a larger inventory of material in process.

It is one of the objects of the invention to reduce the cost of manufacturing bolts and screws having either finished heads or points, or both, by performing these finishing 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 additional manufacturing operation.

Other objects of the invention and the features of novelty will be apparent from the following description, taken in conjunction with the accompanying drawings, 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 bolts 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, with the associated cutters for finishing the opposite ends of the bolt or screw. In this view the parts are shown as they would appear from the line 2—2 of Fig. 1;

Fig. 3 is a horizontal section on the line 3—3 of Fig. 1;

Fig. 4 is a side elevation of a bolt having a finished head and finished point as produced on the machine disclosed herein;

Fig. 5 is a bottom plan of the cutter for finishing the head of the bolt;

Fig. 6 is a side elevation of the stationary thread-rolling die with the pointing die in position therein;

Fig. 7 is a bottom plan of the dies as shown in Fig. 6;

Fig. 8 is a top plan of the cutter for finishing the end of the bolt opposite to the head; and

Fig. 9 is a side elevation of this cutter.

While I have not illustrated in the drawings 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 my invention.

In Figs. 1 to 3, 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 be engaged by the underside of the head of the bolt so as to properly position the bolt in the dies. The usual clamps 17 and 18 are shown in connection with the parts 11 and 12 of the machine for the purpose of clamping the dies in position.

In practicing my invention, I provide a rectangular recess 19 in the bottom face of the stationary thread-rolling die 11, at the corner where the blank first engages the die 11, and in this recess I place a die 20 having a beveled corner surface 21 which is so located that it acts on the end portion of the bolt and rolls a tapered point thereon, as indicated at 22 in Fig. 4. As will be seen from Fig. 2, the beveled surface 21 extends for about one-half of the length of the die 11 and, while the bolt is rolling on this portion of the die 11, the beveled surface 21 acts to perform the above-described function. It is preferable that the surface 21 shall be so formed that the rolling effect will gradually increase as the bolt progresses along the die 11. This means that the surface 21, in addition to being beveled with respect to the working face of the die 11, will also be at a slight angle to the latter in the longitudinal direction.

It is customary to make thread-rolling dies reversible and, for this reason, I have provided a second recess 23 in the bottom face of the die 11, which will be adapted to receive the die 20 when the die 11 is reversed from the position shown in Fig. 3.

The movable die 13 is provided with recesses

24 and 25 and in the recess 24, at the forward end of the die 13, there is a die 26 similar to the die 20, in function, and having a beveled corner surface 27 which acts on the portion 22 of the bolt or screw.

This arrangement of the dies 20 and 26 insures that when the bolt first enters between the dies 11 and 13 the beveled surfaces 21 and 27 will act thereon to roll the tapered point 22 on the bolt and when the die 13 reaches its mid position, as shown in Fig. 3, the rolling of the tapered surface 22 will have been completed and, thereafter, to the end of the stroke of the die 13, the formation of the threads on the end of the bolt will be completed.

Arranged below the die 11 there is a plate 28 having an upstanding rib 29 provided with a cutting edge 30 at the top directly below the axis of the bolt 14. As will be seen from Figs. 2 and 9, the cutting edge 30 is inclined upwardly from the left-hand end of the die 11, where the bolt enters, to about the point 31, and from 31 to the end 32 the cutting edge is parallel with the top and bottom surfaces of the die 11.

As the surfaces 21 and 27 of the dies 20 and 26, respectively, operate on the end portion of the bolt to roll a taper thereon, this rolling action tends to elongate the bolt blank and form a downwardly projecting burr thereon. As the bolt 14 progresses through the machine, between the dies 11 and 13, the cutting edge 30 operates on the end surface of the bolt to remove the burr, as it is formed, and the straight portion of the cutting edge 30 between the points 31 and 32 will finish the end of the bolt so that, when it is discharged from between the dies 11 and 13, it will have what is known in the trade as a finished point.

In order to finish the head of the bolt, I provide a bar 35 which rests on the bar 15 and is secured to the die 11 by bolts 36 which pass through openings 37 in the bar 35. The bar 35 is provided with a longitudinally extending recess 38 through which the head of the bolt passes as the bolt moves along the thread-rolling dies 11 and 13, and directly above the axis of the bolt there is a downwardly projecting longitudinal rib or blade 39 having a cutting edge 40 which operates on the end surface of the head to finish the latter and, from Fig. 2, it will be noted that the cutting edge 40 is downwardly inclined from the left-hand end of the die 11 toward the opposite end so that the cutting edge 40 will act progressively in finishing the end surface of the head of the bolt.

The bar 35 is also provided with a series of downwardly projecting teeth or cutters 41 having inclined cutting edges 42 which chamfer the head of the bolt as indicated at 43, in Fig. 4 and, as will be noted from Fig. 2, the cutters 41 are arranged in a downwardly inclined series from the left-hand end of the die 11 toward the opposite end so as to act progressively in forming the chamfer 43.

In the operation of the apparatus, the bolt blank will be entered between the dies 11 and 13, in the usual way, and as the threads are being formed, the rolling surfaces 21 and 27 will form the tapered point and the cutting edge 30 will finish the end of the bolt. At the same time that the threads are being formed, the end surface of the head will be finished by the cutting edge 40 and the chamfer 43 will be formed by the cutters 41 so that, as the threads are being formed on the blank, by the dies 11 and 13, the

opposite ends of the blank will be finished and when the bolt is discharged from between the dies 11 and 13, it will have a finished point and a finished head and be completed.

While I have illustrated and described what I now consider to be the preferred embodiment of my invention, it will be understood that changes in the details of construction and arrangement of the various parts 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-making machine, in combination with a pair of thread-rolling dies, one of said dies having a recess in its working face at the end thereof at which the bolt enters, said recess extending longitudinally of the die, a die positioned in said recess and having a surface inclined with respect to said working face for rolling a taper on the threaded end of the bolt, and cutter means independent of the last mentioned die for shaving off the end of the bolt and form a finished flat surface thereon as the threads are being formed.

2. In a bolt-making machine, in combination with a pair of thread-rolling dies, a die associated with each of said pair of dies and having a working face in the space between said pair of dies for operating on the end portion of the bolt to reduce and elongate the same, and a shaving tool independent of the second mentioned dies and which operates on the end of the bolt to shave down said end and form a finished flat surface thereon during the threading operation.

3. In a bolt-making machine, in combination with a pair of thread-rolling dies, a die associated with each of said pair of dies and having a working face in the space between said pair of dies for operating on the end portion of the bolt to reduce and elongate the same, and a cutting tool independent of the second mentioned dies and having its cutting edge arranged substantially in the plane of movement of the bolt axis and operating on the end of the bolt to shave down said end and form a finished flat surface thereon during the threading operation.

4. In a bolt-making machine, in combination with a pair of thread-rolling dies, a die associated with one of said pair of dies and having a working face in the space between said pair of dies for operating on the end portion of the bolt to reduce and elongate the same, and a cutting tool having its cutting edge arranged substantially in the plane of movement of the bolt axis and slightly inclined relative to the path of movement of the bolt and operating on the end of the bolt to form a finished surface thereon during the threading operation.

5. In a bolt-making machine, in combination with a pair of thread-rolling dies, a die associated with one of said pair of dies and having a working face in the space between said pair of dies inclined with respect to the bolt axis for operating on the end portion of the bolt to form a taper thereon, and a cutting tool having its cutting edge arranged substantially in the plane of movement of the bolt axis and slightly inclined relative to the path of movement of the bolt and operating on the end of the bolt to form a finished surface thereon during the threading operation.

6. In a bolt-making machine, in combination with a pair of thread-rolling dies, a cutting tool having a cutting edge arranged substantially in the plane of movement of the bolt axis for operating on the head of the bolt to form a finished

surface thereon, and a series of cutters arranged longitudinally of the path of movement of the bolt for chamfering said head.

7. In a bolt-making machine, in combination with a pair of thread-rolling dies, a cutting tool having a cutting edge arranged substantially in the plane of movement of the bolt axis for operating on the head of the bolt to form a finished surface thereon, and a series of cutters in relatively stepped arrangement longitudinally of the path of movement of the bolt for chamfering said head.

8. In a bolt-making machine, in combination with a pair of thread-rolling dies, a cutting tool having a cutting edge arranged substantially in the plane of movement of the bolt axis and slightly inclined with respect to the path of movement of the bolt and operating on the head of the bolt to form a finished surface thereon, and a series of cutters arranged longitudinally of the path of

movement of the bolt for chamfering said head.

9. In a bolt-making machine, in combination with a pair of thread-rolling dies, a cutting tool having a cutting edge arranged substantially in the plane of movement of the bolt axis and slightly inclined with respect to the path of movement of the bolt and operating on the head of the bolt to form a finished surface thereon, and a series of cutters in relatively stepped arrangement longitudinally of the path of movement of the bolt for chamfering said head.

10. In a bolt-making machine, a head finishing tool comprising a relatively long blade having a cutting edge for finishing the end surface of the head, and a series of teeth arranged to one side of said blade and having cutting edges inclined with respect to the end surface of the bolt for chamfering the head of the bolt.

HENRY J. HOGUE.

25 100
30 105
35 110
40 115
45 120
50 125
55
60
65
70