June 3, 1941. S. D. JOHNS 2,244,622

APPARATUS FOR POINTING AND ROLL THREADING BOLTS

Filed June 9, 1939 2 Sheets-Sheet 1

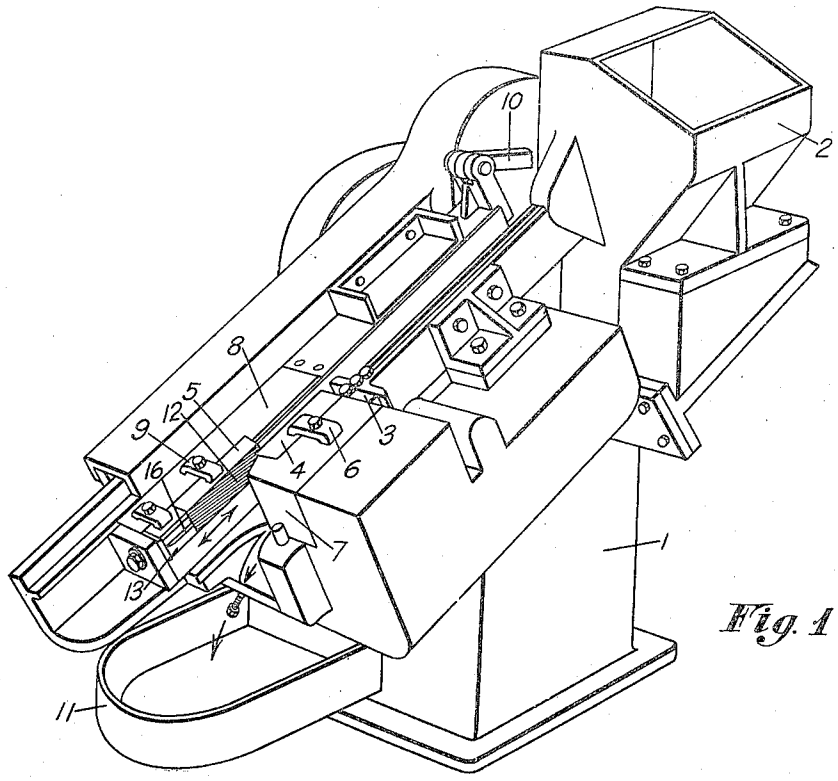


Fig. 1

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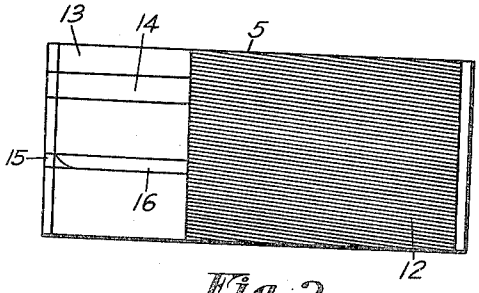


Fig. 2.

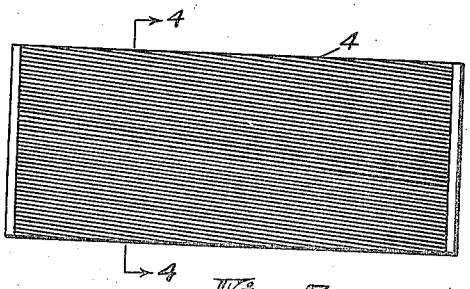


Fig. 3.

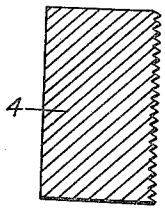


Fig. 4.

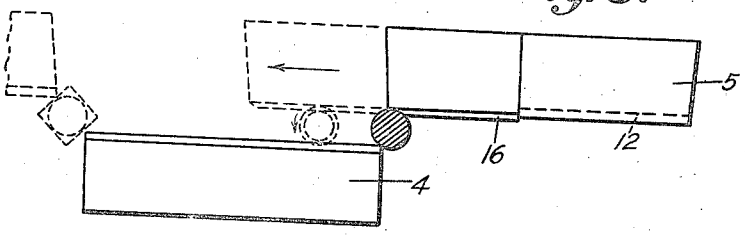


Fig. 5.

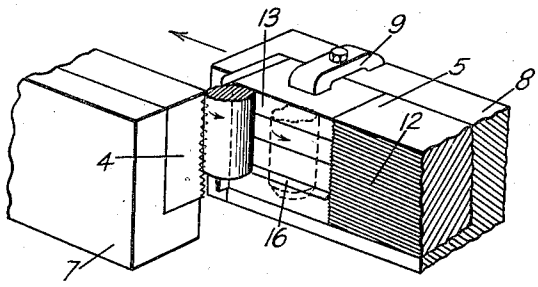


Fig. 6.

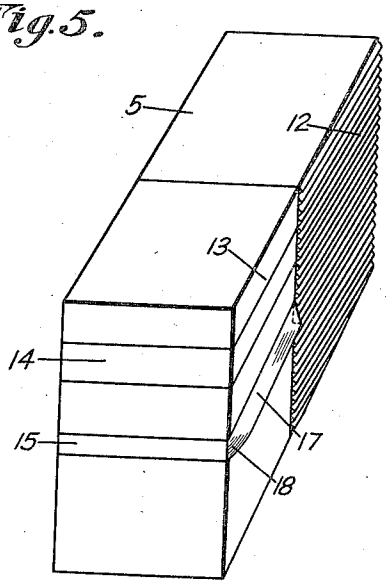


Fig. 7.



Fig. 8.

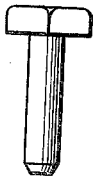


Fig. 9.

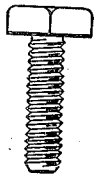


Fig. 10.

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UNITED STATES PATENT OFFICE

2,244,622

APPARATUS FOR POINTING AND ROLL THREADING BOLTS

Stanton D. Johns, Columbus, Ohio, assignor to The Columbus Bolt Works Company, Columbus, Ohio, a corporation of Ohio

Application June 9, 1939, Serial No. 278,309

4 Claims. (Cl. 80—9)

My invention relates to apparatus for pointing and roll threading bolts. It has to do, more particularly, with apparatus for forming a point or tapered end on a bolt and for rolling threads on the bolt. However, this invention is also applicable to studs, screws and similar articles.

In the past, two methods have been most commonly used in forming points on bolts and rolling threads thereon. According to one method, the point is formed on the bolt in one operation and then the threads are rolled on the bolt in an entirely separate and independent operation. Obviously, this method has certain disadvantages. The two separate operations and the necessary handling of the bolts require considerable time and labor. Another method employed is to point and thread the bolt simultaneously by rolling it between two dies, one of which has a point forming rib formed integral therewith and disposed along the lower edge of the die beneath the thread forming face thereof. One of the great disadvantages of using a die having a point forming portion formed integral adjacent its lower edge, resides in the fact that a different die is required for pointing each bolt having a different thread length. Thus, with this method it is necessary to have a number of dies so that bolts of various thread lengths can be pointed. This is undesirable since the dies are comparatively expensive.

One of the objects of my invention is to provide an apparatus for pointing bolts and for rolling accurate threads thereon which is extremely simple and practical, and which is very economical to use.

Another object of my invention is to provide a threading and pointing die which may be easily and quickly adjusted so that it may be employed in pointing bolts of any thread length.

In its preferred form, my invention contemplates the provision of a method whereby the bolts are pointed and threaded in a single operation, as previously indicated. This is accomplished by rolling the bolts between the adjacent faces of two dies. One of these dies is provided on its face with thread forming ribs in the usual manner extending substantially from one end thereof to the other. The other die has similar thread forming ribs formed on the face thereof and extending throughout the greater portion of the length thereof. However, adjacent to the end thereof which is the first to contact with the bolt, the face of this die is flat and is substantially flush with the pitch line of the thread forming portion, with the exception of an outwardly projecting rib which is adapted to engage the end of the bolt and point it. With this structure, when the bolts are rolled between the two dies, the end of the bolt is first pointed and then the bolt is threaded, but this is accomplished in a single operation.

The point forming rib is formed on the outer edge of a block or plate. This block or plate is clamped between filler blocks which are sufficient in number and width to correspond to the width of the main portion of the die. By changing the relative vertical positions of the block which carries the point forming rib and the filler blocks, the die may be readily adjusted to point bolts of various thread lengths. This is an important feature of my invention since it makes possible the use of a single die for pointing bolts of various thread lengths and it is not necessary to have a number of expensive dies for this purpose.

The preferred embodiment of my invention is illustrated in the accompanying drawings wherein similar characters of reference designate corresponding parts and wherein:

Figure 1 is a perspective view of a roll threading machine designed to thread bolts, screws, studs, rods and special articles in which my invention has been incorporated and which is equipped with automatic article feeding means.

Figure 2 is a face view of the die which has the point forming member associated therewith.

Figure 3 is a similar view of the other die which cooperates with that shown in Figure 2.

Figure 4 is a vertical sectional view taken substantially along line 4—4 of Figure 3.

Figure 5 is a top plan view of the two cooperating dies illustrating how they are moved relative to each other with the bolt or other article therebetween.

Figure 6 is a perspective view of the two dies illustrating how the pointing member functions.

Figure 7 is a perspective view of the die which is provided with the pointing member.

Figure 8 is a side view of a bolt blank.

Figure 9 is a side view of the blank after it has been pointed.

Figure 10 is a side view of the completed bolt.

With reference to the drawings, I have illustrated in Figure 1 a roll threading machine which, in its general structure, is the same as that commonly used at the present time. However, my invention has been incorporated in this machine.

The machine illustrated comprises a base 1 having a bolt receiving hopper 2 on its upper end. Suitable automatic feeding mechanism, indicated

generally by the numeral 3, is provided for feeding the bolts one by one between the stationary threading die 4 and the movable threading and pointing die 5. The die 4 is clamped by clamping member 6 to the stationary support 7. The die 5 is clamped to a movable carriage 8 by means of clamps 9. This carriage is reciprocated by means of a crank and pitman structure 10. After the bolts are finished, they drop from between the dies into a receptacle 11.

The die 4 is illustrated in Figures 3 and 4. This die is of the usual construction and is provided with a thread forming face consisting of a plurality of ribs extending diagonally thereof substantially from one end thereof to the other.

The die 5 is of entirely novel structure and is illustrated in Figures 1, 2, 6 and 7. This die is provided with a thread forming area 12 on its face which is exactly the same as that of the die 4. This thread forming area 12 extends throughout the greater portion of the length of the die. However, at the one end of the die it is provided with a flat smooth area 13. As indicated in Figure 7 this area 13 is substantially flush with the pitch line of the area 12 and the thread forming ribs project a slight distance beyond the surface of the area 13. The area 13 is formed by the inner edges of a plurality of filler blocks 14. These filler blocks may be in any suitable number and are preferably of different thicknesses. Between two of the filler blocks there is disposed a block 15 which has a point forming rib 16 on its inner edge. This rib, as indicated in Figure 7, has a downwardly and outwardly inclined surface 17 throughout its length. Furthermore, at its end the rib tapers inwardly until it merges with the flat surface 13.

As previously indicated, the die 5 is clamped in position by the members 9. The filler blocks 14 and block 15 are separate from the main portion of the die but are disposed at the end thereof in cooperative relationship therewith. The filler blocks 14 are of a width corresponding substantially to that of the body portion of the die. It will be apparent that by rearranging the filler blocks 14 and the block 15, the position of the point forming rib 17 relative to the upper and lower edges of the die may be varied.

In pointing and threading the bolts, the bolts are fed, one by one, between the two dies, as previously stated. A bolt will first enter between the two dies when they are in the position indicated in Figure 1. The bolt will be positioned vertically between the two dies by the feeding mechanism or manually. In some cases the bolts may be suspended between the dies by their heads or the upper end of the articles may extend above the upper edges of the dies. The rib 17 will be properly positioned so that it will contact with the end of the bolt. As the die 4 is moved downwardly, the bolt is rolled between the faces of the dies 4 and 5. When once started in between the two dies it will be gripped and held in the same vertical position throughout its movement between the two dies. The bolt blank which enters between the upper ends of the dies is illustrated in Figure 8. As die 4 moves downwardly, the end of the bolt blank will contact with the pointing rib 17 and a point will be formed thereon in the manner illustrated in Figure 9. The tapered surface 18 facilitates entrance of the end of the bolt between the rib 17 and the cooperating face of the die 4. The shank of the bolt will be first rolled between the thread forming face of the die 4 and the flat area 13 of the die 5. The thread forming face of die 4 will engage the blank but this is merely for the purpose of retaining the blank in position and pressure on the blank at this phase of the operation is not sufficient to thread the blank portion, because of the flat faces of the filler blocks 14. However, at this time the pressure upon the point forming rib 16 is sufficient to accomplish the pointing operation. After the point is formed on the bolt, the shank of the bolt will pass between the thread forming area 12 of the die 5 and the thread forming face of the die 4. This will roll the thread on the bolt and produce a finished article of the type illustrated in Figure 10.

It will be noted that the point is first formed on the bolt. Subsequently, the threads are formed on the bolt. However, this is accomplished in a single operation. A great advantage of my die structure resides in the fact that the block which carries the pointing ribs can be positioned any desired distance from the top edge of the die by rearrangement of the filler blocks. Thus, with this structure, the die may be quickly and easily adjusted to point bolts of various thread lengths.

It will be understood that, although this invention is mainly described in connection with the pointing and threading of bolts, it is also applicable to the threading and pointing of screws, studs, rods and special articles. The pointing unit can be used whether the blank operated upon is threaded and pointed or is merely pointed. Likewise, it will be understood that it is within the scope of my invention to mount the pointing unit either upon the stationary or the movable threading member, or if the pointing operation alone is performed the pointing member may either be movable or stationary while its complemental member may be either stationary or movable. As a matter of fact, both the threading and pointing members or both the pointing members may be movable without departing from the scope of my invention. Obviously, the invention is applicable to machines of the type indicated whether the blanks be fed to threading and pointing or to the pointing apparatus automatically or manually.

Various other advantages will be apparent from the preceding description, the drawings and the following claims.

Where the term "bolts" is used in the claims, it is intended to include screws, studs, rods and special articles of a similar nature.

Having thus described my invention, what I claim is:

1. A die for pointing and threading a bolt comprising a face which is adapted to contact with the bolt, said face being provided with a thread forming area for forming a thread on the body portion of the bolt extending throughout a portion of the length thereof and a flat area extending throughout a different portion of the length thereof, and a projecting point forming rib having a smooth face and being disposed along said flat area only.

2. In a machine of the type described, a pair of dies adapted to be moved longitudinally relative to each other and to have a bolt positioned therebetween, one of said dies having a thread forming face substantially throughout its length and the other of said dies having a face provided with a flat area with a projecting point forming rib extending for a portion of its length and with a thread forming area extending for the remainder of its length which is adapted to cooeprate with

the thread forming face of the other die to form threads on the body portion of the bolt.

3. In a machine of the type described, a pair of dies adapted to be moved longitudinally relative to each other and to have a belt positioned therebetween, one of said dies comprising a body portion having a thread forming face substantially throughout its length, and the other of said dies comprising a body portion having a thread forming face for cooperation with the first-mentioned thread forming face to form a thread on the body portion of the bolt and a point forming unit, said point forming unit being disposed at one end of the body portion and comprising a plurality of filler blocks and a block having a point forming rib on its face which are clamped in cooperative relationship.

4. In a machine of the type described, a die for use in threading and pointing a bolt comprising a main body portion having a thread forming inner face thereon for forming a thread on the body portion of the bolt, and a point forming unit disposed adjacent the end of said body portion, said point forming unit comprising a block having a point forming rib on its face, a plurality of filler blocks between any of which said first block may be disposed, said filler blocks and said first block cooperating to form a unit of substantially the same width as said body portion, and means for clamping said blocks in cooperative relationship with each other and with said main body portion in such a manner that the faces of the filler blocks are substantially flush with the face of the body portion and said rib projects beyond the face of the body portion.

STANTON D. JOHNS.

CERTIFICATE OF CORRECTION.

Patent No. 2,244,622. June 3, 1941.

STANTON D. JOHNS.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, first column, line 40, beginning with the words "in its preferred form" strike out all to and including the word and period "purpose." on same page, second column, line 19; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 22nd day of July, A. D. 1941.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.