J. H. LLOYD.

COMBINED TURNBUCKLE AND SLEEVE NUT.

APPLICATION FILED DEC. 13, 1919.

1,360,421. Patented Nov. 30, 1920.

Fig. 1.

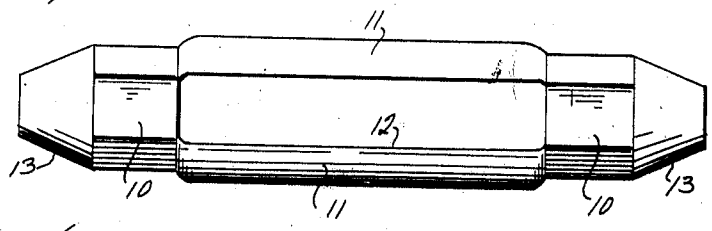


Fig. 2.

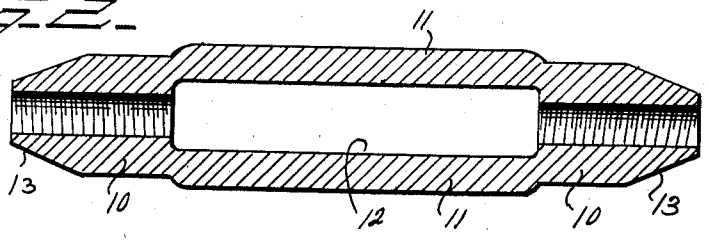
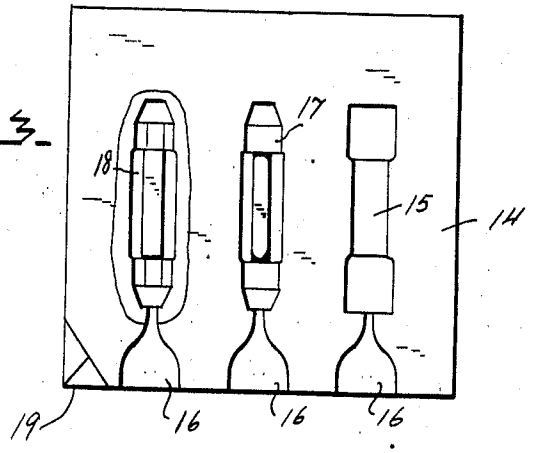


Fig. 3.



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COMBINED TURNBUCKLE AND SLEEVE-NUT.

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Application filed December 13, 1919. Serial No. 344,742.

To all whom it may concern:

Be it known that I, JOHN H. LLOYD, a citizen of the United States, residing at Lebanon, in the county of Lebanon and State of Pennsylvania, have invented certain new and useful Improvements in Combined Turnbuckles and Sleeve-Nuts, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to turn buckles, sleeve nuts and similar articles, and one of the objects of the invention is to provide a combined sleeve nut and turn buckle, that is a device which may be used either as a sleeve nut or turn buckle, the device having the usual interior screw-threaded nuts or heads connected by integral arms, but these nuts or heads being many-sided so as to permit the application of a wrench thereto.

A further object of the invention is to provide a combined sleeve nut and turn buckle which is drop forged in one operation, at one heat, and from one piece of steel, thus improving the quality and character of the device and permitting it to be made very cheaply.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation of a combined turn buckle and sleeve nut constructed in accordance with my invention;

Fig. 2 is a longitudinal sectional view thereof;

Fig. 3 is a view of one member of the die by which this sleeve nut is forged.

Referring to the drawings, in Fig. 1 I illustrate the completed combined turn buckle and sleeve nut. This comprises the two interiorly screw-threaded heads or nuts 10, integrally connected by arms or longitudinal bars 11 spaced from each other to provide the usual inspection opening 12. The heads 10 taper toward the opposite ends of the turn buckle or sleeve nut, as at 13. Of course, it is understood that all these parts are integral and formed of one piece of material. The heads or nuts 10 are formed with a plurality of faces and are preferably hexagonal in cross section so as to permit the application of a wrench to the device in case it is used as a sleeve nut, while the arms 11 permit the device to be applied in the usual manner of a turn buckle in case it is to be used for this purpose. In other words, the device may be turned by means of a bar inserted between the arms 11 or by means of a wrench, either one.

One of my improvements consists in making this combination turn buckle and sleeve nut by a forging operation instead of forming the article in two sections and afterward welding these sections together, as has been proposed, or casting the article, as has been proposed. To this end, I use a pair of dies. These dies have impressions on their confronting faces by which the metal may be forged to shape. These dies are designated 14. The confronting face of each die is formed with a swaging impression 15 having the general shape of the completed turn buckle and sleeve nut, this impression having a relatively narrow body portion and relatively large end portions, and being designed for giving the general shape to the object. This impression 15 is, of course, generally speaking, semi-circular in cross section, as is the like impression on the opposite die, and one end of this impression is connected by a mouth 16 to the front face of the die. The dies are also formed on their confronting faces with a second impression 17 which is more complete than the impression 15, and is designed to spread the metal to form the sight opening 12 in the bar and to generally shape the device, while the third impression 18 is exact in shape and finishes the article. Each of these several impressions is provided with the throat 16.

In the formation of a complete turn buckle and sleeve nut, I take a straight bar of either round or square low carbon steel and this is cut into lengths, each length being just long enough for a man to handle and being long enough to provide for the making of two, three, four or more of the turn buckles. The lighter the buckle or sleeve nut, the longer the bar may be, but for heavy turn buckles, the bar is cut relatively shorter. The end section of a bar is then heated to the desired temperature and for a length determined by the length of the turn buckle, and this heated portion of the bar, which is preferably round, is disposed within the first impression and forged by the usual drop hammer, while the bar is being turned. This hammers the bar into its general shape and gathers exactly the right amount of material in the proper place for the turn buckle. Thus, the forged end of the bar when removed from the first impression has rela-

tively large heads and a relatively narrow middle portion. It is next disposed within the impression 17 and while there is given a few blows by the drop hammer until the central opening 12 has been spread and the side bars 11 formed and forced outward. The partially completed turn buckle is then placed within the third or finishing impression 18 and is there hammered until it is finished according to specifications. It is then removed and cut off by means of the shear knife 19 which is formed on the confronting dies. The bar is then again heated and a second turn buckle made, and so on until the bars are used up. The blanks thus formed are then bored and threaded in the usual manner.

It will be noticed that the material forming the arms 11 is formed by spreading out this opening 12 and crowding the material on each side of the slot thus formed laterally outward to form the completed buckle. Thus, these arms, because of this crowding operation, are extremely strong and are not liable to break, as would be the case were a blank simply punched to provide these arms. Punching the slot 11 through a piece of rolled material, either iron or steel, develops fractures that are bound to leave the arms in a weak condition and are liable to break. By forging these arms in the manner described, the arms are particularly strong and have a strength equal to the strength of the nuts or heads themselves.

It will be seen that my turn buckle and sleeve nut is drop forged (not welded or blanked out) from a section of rolled soft steel. Another advantage arising from the drop forging of these buckles is that the grain and fiber of the steel is refined to a degree that gives it a very great tensile strength, and in no other way, except by drop forging can such refinement of the steel be accomplished. Furthermore, by drop forging the turn buckles by means of dies as described, the blank will not be allowed to vary in section or in length out of proportion to the standard specification as required and each end will be perfectly concentric.

It will be seen that by reason of the fact that the combined turn buckle and sleeve nut is not cast, there are no blow holes which may develop either inside or outside of the structure of the turn buckle, the quick but light vertical blows that it is subjected to during the process of forging packing the steel therein and making it 100% tougher than when rolled at the mill. Furthermore, by drop forging this article, I can make it at a much less price and at the same time make it conform exactly to standard specifications and have standard physical and tensile strengths.

The reason for making the extremities of the turn buckle sleeve nuts taper as shown at 13 in the drawings is to retain the appearance as much as possible of the ordinary turn buckles at the ends, and particularly to save weight and material and to save the cost of forging the turn buckles, to form the ends at right angles to the axis of the turn buckle. To so forge the ends of the turn buckle would entail the use of heavier material to start with and would take considerably longer to forge with no benefit. The reason for forming the first impression 15 with its middle portion smaller than the ends is because it takes less material to make the arms, that is the portions 11, than it does the ends by my method of drop forging the same. The slot 12 is not started at all by the first impression 15, but is started by the second impression 17. This impression is exactly the shape of the finished impression 18, except that all the corners and sharp edges are removed and the blank given heavy fillets and is somewhat larger in diameter to relieve any danger of fracture. The third impression 18 is, of course, to be provided with the usual overflow recess, indicated by dotted lines, into which any excess material may go. This excess material or fin is ground off or turned off after the turn buckle is finished.

I claim:—

1. A method of forming a combined turn buckle and sleeve nut consisting in heating a rod from which the article is to be made, said rod being greater than the length of the completed turn buckle, inserting one end of the rod while heated between dies having complementary impressions shaped to form a relatively small diametered middle portion and relatively large heads on the blank, then in the same heat subjecting it to the action of a second set of die impressions constructed to form and spread the central slot of the turn buckle and generally shape the heads and body of the buckle, and then in the same heat subjecting the partially formed turn buckle to the action of a third forging between die impressions formed to perfect and complete the turn buckle, then cutting off the formed end of the rod of material and boring and screw-threading the head.

2. A method of forming a combined turn buckle and sleeve nut consisting in using a single pair of dies having three complementary impressions, one of said pair of impressions being shaped to form a relatively small diametered middle portion and relatively large heads on the blank, another pair of impressions being shaped to form and spread the central slot of the turn buckle and generally shape the heads and body of the buckle, and the third set of impressions being formed to perfect and complete the turn buckle, heating a length of material greater than the length of the completed

turn buckle, inserting the heated end of the length of material between the first named impressions, forging the blank by means of said impressions, then in the same heat subjecting it to the action of the second set of die impressions, and then in the same heat forging it between the third pair of die impressions, then cutting off the formed end of the length of material from the body of the material and boring and screw-threading the heads.

3. A method of forging a combined turn buckle and sleeve nut consisting in heating a rod from which the turn buckle is to be made, said rod being a number of times longer than the total length of the completed buckle, inserting the heated end of the rod between dies having complementary impressions shaped to form a relatively small diametered middle portion and relatively large heads on the blank and drop forging the blank by said dies, then in the same heat drop forging the blank by the action of a second set of die impressions constructed to form and spread the central slot of the turn buckle and generally shape the heads and body of the buckle, and then in the same heat perfecting and completing the turn buckle by drop forging the blank between the third pair of die impressions, then cutting off the formed end of the rod of material and boring and screw-threading the heads.

In testimony whereof I hereunto affix my signature.

JOHN H. LLOYD.