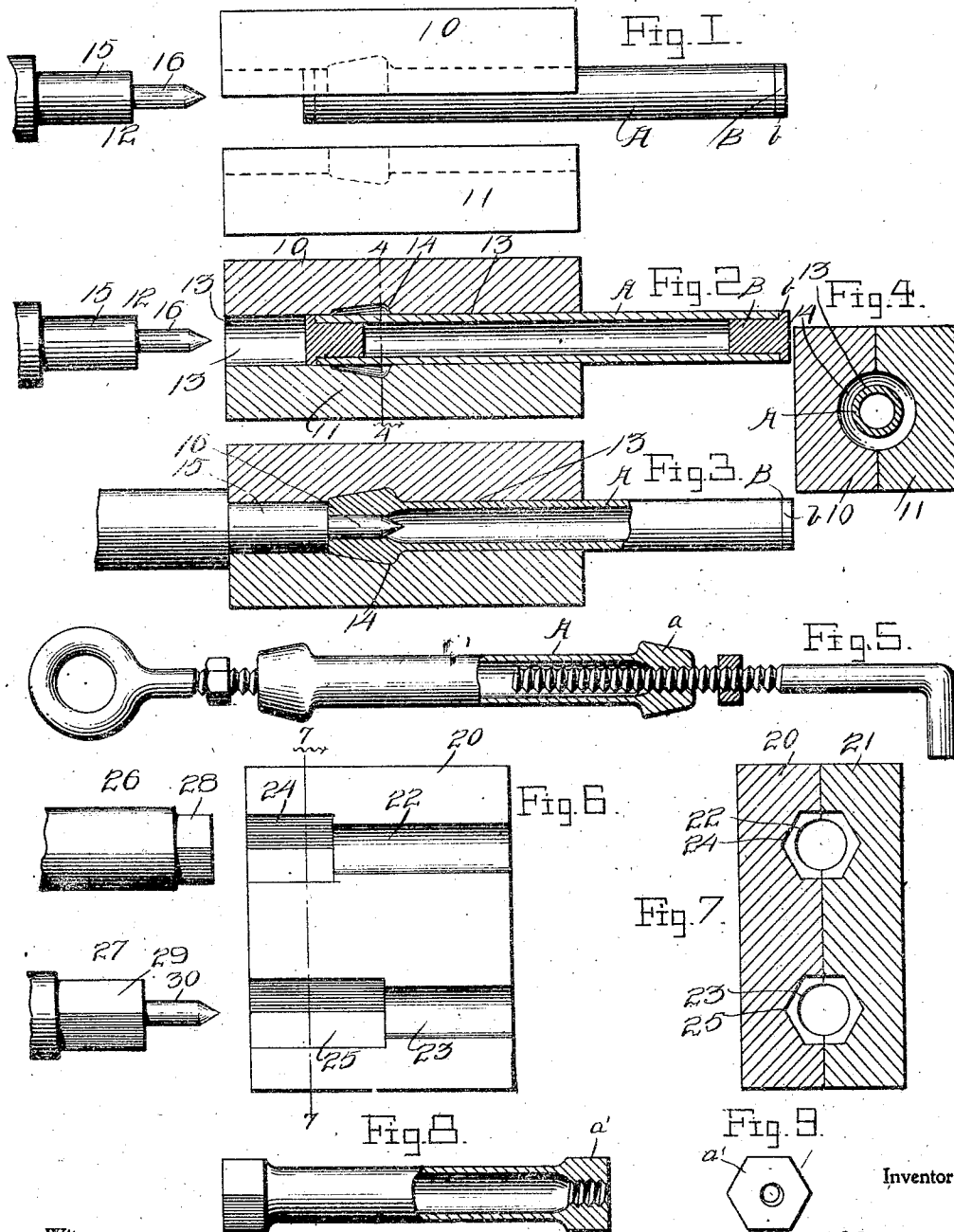


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W. E. RENNER.
PROCESS OF MAKING TURNBUCKLES.
APPLICATION FILED AUG. 3, 1903.

NO MODEL.



Witnesses

C. A. Reinhardt.

C. A. Reinhardt

By

W. E. Renner
W. E. Renner

Attorney

UNITED STATES PATENT OFFICE.

WILLIAM E. RENNER, OF SEBRING, OHIO.

PROCESS OF MAKING TURNBUCKLES.

SPECIFICATION forming part of Letters Patent No. 756,141, dated March 29, 1904.

Application filed August 3, 1903. Serial No. 168,096. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. RENNER, a citizen of the United States, residing at Sebring, in the county of Mahoning and State of Ohio, have invented certain new and useful Improvements in Processes of Making Turnbuckles; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improved process of making turnbuckles, sleeve-nuts, and the like.

The object of my invention is to improve and simplify the manufacture of articles of this character and to thereby produce a strong durable turnbuckle or the like in a simple, rapid, and inexpensive manner.

With this and other objects in view the invention consists in certain novel features hereinafter fully described and claimed.

In the accompanying drawings of the apparatus used in carrying out my invention, and which forms the subject-matter of a separate application for Letters Patent filed herewith and bearing Serial No. 168,096, Figure 1 is a top plan view of the apparatus used in making my improved turnbuckles, the dies being separated and the stock in position ready to be clamped. Fig. 2 is a horizontal sectional view through the dies in their closed position and the stock clamped between them. Fig. 3 is a similar view illustrating the operation of the dies and the plunger in welding and piercing the stock. Fig. 4 is a vertical transverse sectional view through the dies, taken on the line 4 4 of Fig. 2. Fig. 5 is a side elevation, partly in section, of my improved turnbuckle. Fig. 6 is a vertical central sectional view through a portion of an apparatus used in making a modified form of turnbuckle, the die and the plungers appearing in side elevation. Fig. 7 is a vertical transverse sectional view through the same, taken on the line 7 7 of Fig. 6. Fig. 8 is a side elevation, partly in section, of a turnbuckle made by the apparatus shown in Fig. 6. Fig. 9 is an end view of the same.

The apparatus, as illustrated in Figs. 1 to 4 of the drawings, is designed for forming the

turnbuckle or sleeve-nut with round heads, as shown in Fig. 5, and comprises a stationary die 10, a reciprocating die 11, and a combined plunger and piercer 12. Both of said dies are alike, their inner coacting faces being formed with longitudinally-disposed semicylindrical grooves 13, in which the stock from which the turnbuckle is to be made is clamped, and with semi-annular recesses or depressions 14, in which the round heads of the turnbuckles are formed. It will be seen that when the die 11 is moved into contact with the stationary die 10, as shown in Fig. 2, the stock will be clamped in the bore formed by the grooves 13. The reciprocating plunger 12 comprises the cylindrical portion 15, which is adapted to enter the bore formed by the grooves 13 and to compress and weld the stock, as hereinafter set forth, and the pointed cylindrical piercer 16, which is adapted to pierce the stock and force the same into the depressions 14 to form the heads or nuts upon the turnbuckles. Any desired mechanism may be employed for reciprocating the die 11 and the plunger 12, and if so desired either one or both of the dies may be movable and they may be made to reciprocate toward and from the plunger.

In the practice of my invention I take stock in the form of a hollow cylindrical tube or pipe A of suitable length and thickness to form the desired size of turnbuckle and then insert in each end a plug B, having a head b equal in diameter to the tube A. One end of the tube and its contained plug is then heated to the welding-point, and the same is placed, as shown in Fig. 1, in the die 10, the rear end of the tube abutting against a suitable stop-gage (not illustrated) which is mounted upon the machine. The die 11 is then reciprocated against the die 10 to slightly compress the heated portion of the tube and to clamp the same. Simultaneous with the closing of the die 11 upon the die 10 the plunger and piercer 12 is rapidly thrust between said dies, as seen in Fig. 3. It will be seen that the blow of the plunger immediately after that of the dies will weld the plug and the end of the tube into a homogeneous mass and at the same time expand or press the metal into the depressions 14 to form a head or nut a upon the tube and

also pierce said head, as shown. It will be further noted that even if the weld between the plug and tube is imperfect the plug will be securely held within the tube by the spreading of the plug under the action of the piercer 16. The heads *a* reinforce or strengthen the ends of the tube and form nuts to receive the screws of the turnbuckle, as shown in Fig. 5. Owing to the clamping action of the two dies upon the tube and the guiding of the plunger 15 in the grooves 13, the bores formed in the heads *a* will be concentric with the tube, and the heads will be entirely symmetrical.

When it is desired to form hexagonal heads or nuts *a* upon the turnbuckle, as shown in Figs. 8 and 9 of the drawings, the apparatus illustrated in Figs. 6 and 7 is used, the dies 20 and 21 in this form being provided with upper and lower semicylindrical grooves 22 and 23, at the outer ends of which are formed semi-hexagonal recesses or depressions 24 and 25. Two reciprocating plungers 26 and 27 are provided to coact with the upper and lower grooves and depressions in the dies, the upper plunger, 26, being provided with a hexagonal portion 28, adapted to enter the hexagonal bore formed by the depressions 24 of the dies, and the lower plunger being provided with a hexagonal portion 29 and a piercer 30. The operation of this apparatus is very similar to that previously described. The stock is properly heated and placed first in the upper grooves 22, where the clamping action of the dies and thrust of the plunger 26 will weld the plug in the end of the tube and at the same time expand the metal into the depressions 24 to form the hexagonal heads

a'. The dies then separate to permit the partially-finished tube to be dropped into the grooves 23 and depressions 25, where the reciprocation of the plunger and piercer 27 will pierce said head and slightly compress the same, as will be readily understood. It will be observed that in both forms of the apparatus the plungers enter the bores formed between the dies before the piercers come in contact with the stock. Hence the plungers are guided, and the bores in the heads *a* and *a'* will be formed concentrically.

From the foregoing description, taken in connection with the accompanying drawings, it is thought that the mode of practicing my invention and the advantages thereof will be readily understood.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

The process of reinforcing tubular stock, which comprises the insertion of a solid metallic plug within the bore of said stock, heating to a welding heat the plug and that portion of the stock immediately surrounding the same, clamping said stock between dies formed with recesses and then piercing and expanding said plug radially to force it and the portion of the stock which surrounds it into said recesses, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM E. RENNER.

Witnesses:

H. R. EWING,
CHAS. J. BUSH.