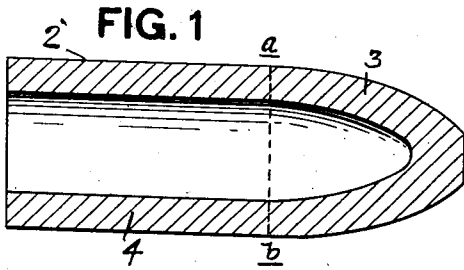
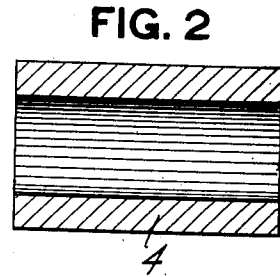
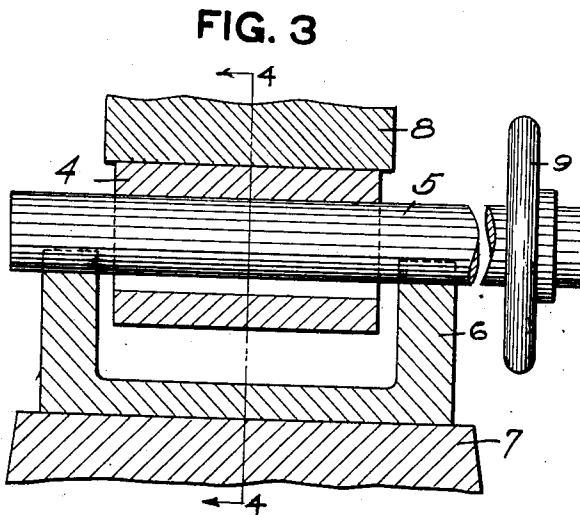
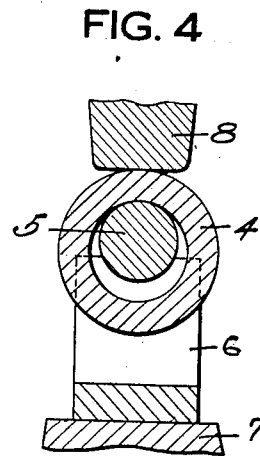
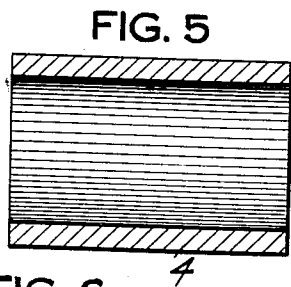
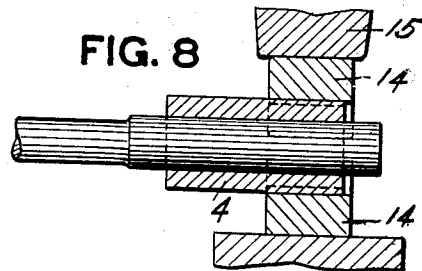
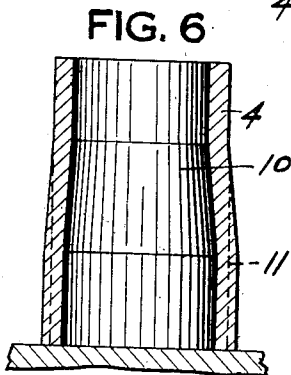
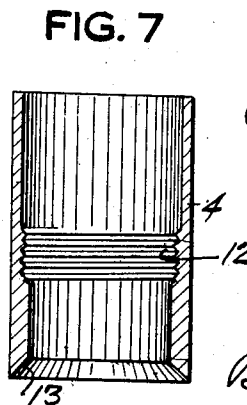
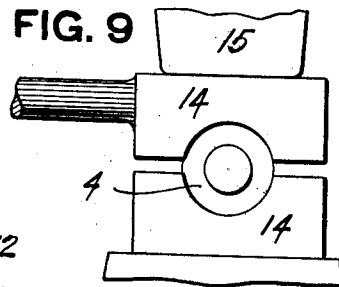


J. J. LARKIN.
METHOD OF MAKING CASING SHOES, &c.
APPLICATION FILED OCT. 11, 1919.

1,348,013.

Patented July 27, 1920.



INVENTOR

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UNITED STATES PATENT OFFICE.

JOHN J. LARKIN, OF BARTLESVILLE, OKLAHOMA.

METHOD OF MAKING CASING-SHOES, &c.

1,348,013.

Specification of Letters Patent. Patented July 27, 1920.

Continuation of application Serial No. 233,474, filed May 9, 1914. This application filed October 11, 1919.
Serial No. 330,014.

To all whom it may concern:

Be it known that I, JOHN J. LARKIN, a citizen of the United States, and resident of Bartlesville, in the county of Washington and State of Oklahoma, have invented a new and useful Improvement in Methods of Making Casing-Shoes, &c.; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to a method of forming drive or casing shoes for oil or like wells or like cylindrical articles.

This is a continuation of an earlier application, Serial No. 233,474, filed May 9th, 1914.

I have found that I can utilize to great advantage rejected shell forgings in carrying out my invention, and I have accordingly illustrated and described it in connection with such forgings.

In the accompanying drawing, Figure 1 is a view of a rejected shell forging, or other hollow steel forging, indicating the line of cut to remove the required portion; Fig. 2 is a view of the cylindrical portion; Fig. 3 is a sectional view showing the cylindrical forging with a saddle mandrel inserted and resting in a saddle under a suitable hammer or forging-press; Fig. 4 is a cross-section on the line 4-4, Fig. 3; Fig. 5 shows the forging as finished on the saddle mandrel; Fig. 6 shows the forging with the tapered forging plug therein; Fig. 7 is a view of the finished article, which in this case is a drive shoe; and Figs. 8 and 9 show suitable apparatus for reducing the walls of one end of the forging before forging it on the saddle mandrel.

Referring to the drawing, the numeral 2 designates a rejected shell forging of suitable size and wall thickness which is first sheared or cut along the line *a-b* to remove the tapered or conical end portion or nose 3 which leaves the cylindrical hollow forging 4, as shown in Fig. 2. The cylindrical forging is heated to the proper temperature and a saddle-mandrel 5 is introduced to support the forging. Said saddle-mandrel is then supported upon the saddle 6 which rests upon the anvil-block 7, to be acted on by the die-block 8 of a suitable hammer or forging-press. By the blows of the die-block 8, the walls of the

forging are reduced evenly by turning the mandrel by means of the handle 9, the forging turning with said mandrel. By reducing the thickness of the walls, the inside and outside diameters of the forging are increased.

When the forging has been hammered to the desired diameter on each end, it is then driven over the finishing plug 10, as indicated in Fig. 6. This acts to size the forging on the inside, and gives to the inner surface of the article the same shape as the outer surface of the plug, while at the same time bulging out the walls of the forging. The finishing plug is then removed and the forging, when cold, is then placed in a lathe and a portion of the outer metal removed, as indicated by the dotted line 11, Fig. 6, which straightens out the outer walls of the forging, as shown in Fig. 7. Where a drive-shoe is to be formed, threads 12 are then formed on the inside and the thick end of the drive-shoe is beveled at 13 so that in removing an under-reamer from the well, the cutters of the under-reamer will be tripped or collapsed by striking the beveled bottom of the drive-shoe in the ordinary manner.

The threads 12 provide for the screwing of the drive-shoe onto the bottom of the pipe, which goes into the well, the purpose of said shoe being to strengthen and protect the lower end of said pipe as well as to serve as a packer, the weight of the casing above forcing the beveled edge 13 into the rock or earth and thus preventing the water from going down into the hole below the shoe.

While I have illustrated my invention in connection with an ordnance shell forging having a tapered or conical end, it will be understood that it applies as well to rejected ordnance shell forgings having a flat nose.

In some instances, it may be desirable to reduce the thickness of the walls on one end of the forging before putting the forging on the saddle mandrel 5, and in this case, as shown in Figs. 8 and 9, the forging is put on a forging mandrel and the walls at one end are reduced by placing the forging in forming blocks 14, and by the hammer die 15, reducing the forging as indicated in dotted lines Fig. 8.

In the manufacture of these drive shoes alone, great saving is effected by my method as heretofore it was customary to take a solid piece of steel; punch a hole in the
5 same, and then draw it to length after which the forging was put on a saddle and finished.

It is apparent that other articles besides drive-shoes may be made by my invention
10 where a cylindrical article is to be formed from a forging.

What I claim is:

1. The method of forming drive or casing shoes for oil-wells, or like cylindrical
15 articles, consisting in heating a cylindrical blank, expanding the blank to shape it interiorly and at the same time increase its external diameter over its finished size for a portion of its length, and then removing
20 the expanded metal exteriorly from the

blank, thereby producing a straight outside wall for the entire length of the blank.

2. The method of forming drive or casing shoes for oil-wells or like cylindrical articles, consisting in heating the cylindrical blank, inserting a tapered plug in the
25 blank to conform the inner surface of the blank to the outer surface of the plug, thereby increasing its external diameter, and then removing the expanded metal exteriorly from the blank to produce straight
30 outside walls for the entire length of said blank.

In testimony whereof, I, the said JOHN J. LARKIN, have hereunto set my hand.

JOHN J. LARKIN.

Witnesses:

ROBERT L. GORDON,
JACK FISHER.