

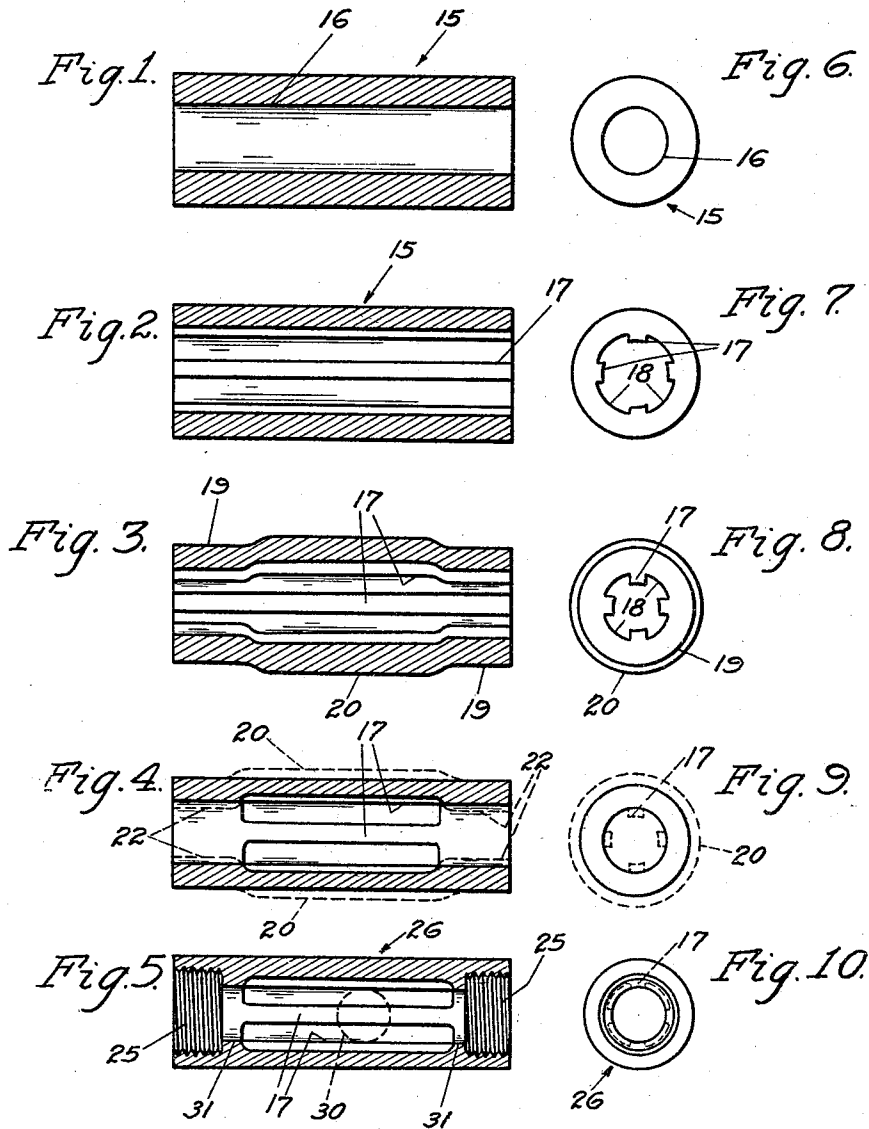
Aug. 9, 1932.

E. E. STEVENSON

1,870,970

METHOD OF MAKING BLIND CAGE SLEEVES WITH BALL GUIDE INTEGRAL

Filed March 7, 1930



INVENTOR.
Edward E. Stevenson
BY *Robt. W. Pearson*
ATTORNEYS.

UNITED STATES PATENT OFFICE

EDWARD E. STEVENSON, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO EMSCO DERRICK
AND EQUIPMENT COMPANY, OF LOS ANGELES, CALIFORNIA

METHOD OF MAKING BLIND CAGE SLEEVES WITH BALL GUIDE INTEGRAL

Application filed March 7, 1930. Serial No. 433,965.

This invention relates to a valve cage and method of making the same.

An object of the invention, considered as a new article of manufacture, is to provide a valve cage having the maximum strength and durability possible to secure with the use of the minimum amount of weight and material.

It has sometimes been customary to provide guide ribs within a valve cage for a ball valve, making said ribs entirely separate from the sleeve. In such cases the sleeve could not be reinforced from the material contained in the ribs. Another method of constructing valve cages has been to cast the ribs within the sleeve as an integral part thereof, but this method has not proven entirely satisfactory, due to the kind of material necessary to use in such a process and due to the roughness of the cast surfaces.

By using the method provided by this invention, the sleeve is progressively wrought upon by a series of operations whereby it is formed into the proper shape and at the same time internal ribs are formed integral therewith.

Other objects, advantages and features of invention, both with regard to the new article of manufacture thereby produced, and with regard to the method whereby said article of manufacture is constructed, may hereinafter appear.

Referring to the accompanying drawing, which illustrates what is at present deemed to be a preferred embodiment of the invention,

Fig. 1 is a longitudinal mid-section of a cylindrical metal tube which is subjected to the various steps of the method and from which the valve cage is produced.

Figs. 2, 3, 4 and 5 illustrate consecutively the progressive steps which are performed in carrying out the method.

Figs. 6 to 10, inclusive, are each end views of the sectional views opposite to which they are respectively located.

Referring in detail to the drawing, the first step of this newly invented method consists in subjecting a cylindrical piece 15, preferably made of forged steel, to the action of

a drill whereby an axial hole 16 is drilled therethrough.

The second step of the method consists in forming, by broaching or equivalent methods the longitudinal internal ribs 17, four of these ribs being shown in the illustrated embodiment of the invention. The channeled out spaces between these ribs are designated 18.

The third step of the method consists in swedging down the end portions of the sleeve at 19 around each end thereof as shown in Fig. 3 thus leaving a diametrically enlarged central portion 20.

The fourth step of the method consists in turning off the metal portion 20 of the external surface thus bringing down the exterior surface of the sleeve to a uniform diameter as shown in Fig. 4. A further part of this step of the method consists in boring out the internally contracted portion 22 at each end of the sleeve as indicated in dotted lines in Fig. 4, with the result that the internally ribbed central portion measured from the inner sides of its ribs, is of the same internal diameter as the remainder of the tube.

These last two operations may be performed in the order stated or in the reverse order or simultaneously, as desired. After these operations have all been performed, screw threads 25 are tapped into one end of the finished sleeve 26 in order to receive the externally screw threaded valve retaining ring (not shown).

In Fig. 5 a ball valve 30 is indicated in dotted lines within the valve cage this valve being of as great a size as can be inserted past the contracted portions 31 adjacent the ends of the valve cage.

I claim:—

1. The method of constructing a valve cage which consists in boring a hole axially through a cylindrical piece of steel, then forming within the tube thus made longitudinal ribs by means of channeling out from end to end of said tube circumferentially spaced recesses, then swedging down both end portions of the internally ribbed sleeve thus formed, thus lessening both the internal and external diameter of the end portions thereof, and then in boring out said contracted end

portions and thus increasing their internal diameter to substantially the same diameter as the internal diameter of said body portion measured between the inner edges of the ribs thereof.

2. The method of constructing a valve cage which consists in boring a hole axially through a cylindrical piece of steel, then forming within the tube thus made longitudinal ribs by means of channeling out channels from end to end of the tube, then swedging down both end portions of the internally ribbed sleeve thus formed, thus lessening both the internal and external diameter of the end portions thereof, and then in boring out said contracted end portions and thus increasing the internal diameter of each of said end portions a sufficient amount to remove the ribbed surfaces within the contracted end portions of the tube.

3. The method of constructing a valve cage which consists in boring a hole axially through a cylindrical piece of metal, then forming within the tube thus made longitudinal ribs by means of machining channels from end to end of said tube, then swedging down an end portion of the internally ribbed sleeve thus formed, thus lessening both the internal and external diameter of such end portion thereof, and then in boring out said contracted end portion to increase the internal diameter thereof and render it smooth.

4. The method of constructing a valve cage which consists in boring a hole axially through a cylindrical piece of metal, then forming within the tube thus made longitudinal ribs by means of machining out channels from end to end of said tube, then swedging down both end portions of the internally ribbed sleeve thus formed, thus lessening both the internal and external diameter of the end portions thereof, and then in boring out said contracted end portions.

In testimony whereof I hereunto affix my signature.

EDWARD E. STEVENSON.

50

55

60

65