Oct. 27, 1931. E. E. STEVENSON 1,829,022

METHOD OF CONSTRUCTING VALVE CAGES

Filed Jan. 3, 1930

Fig. 1.

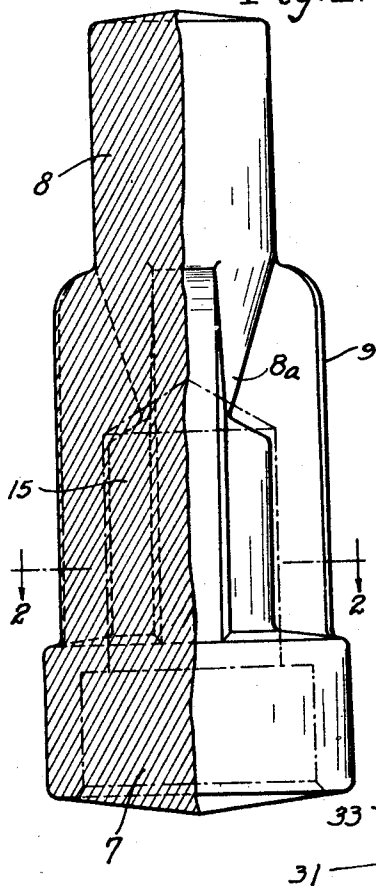


Fig. 5.

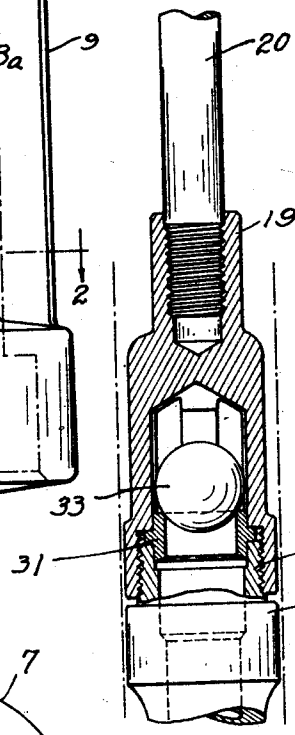


Fig. 3.

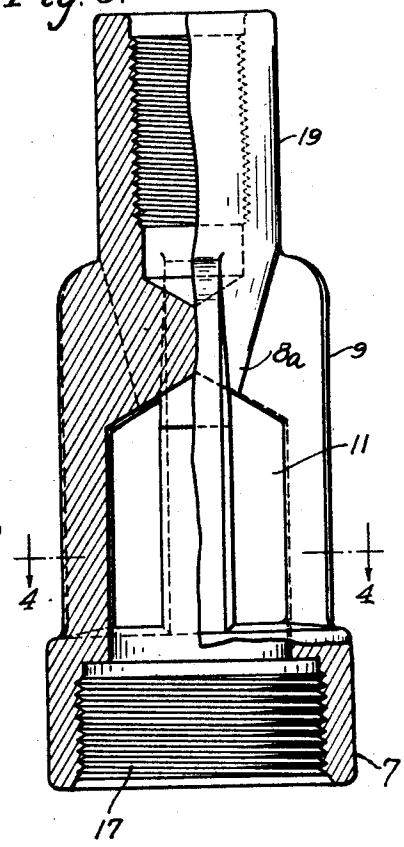


Fig. 2.

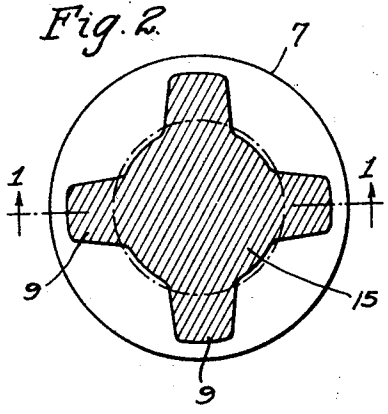
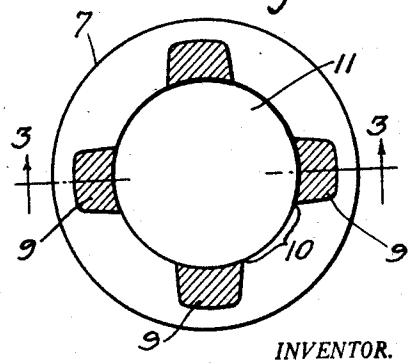


Fig. 4.



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UNITED STATES PATENT OFFICE

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METHOD OF CONSTRUCTING VALVE CAGES

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This invention relates to a method applicable more particularly to the formation of valve cages but adapted to the formation of other hollow bodies having a cylindrical interior chamber provided with lateral openings.

An object of the invention is to provide a method of constructing valve cages in an inexpensive manner by the act of forging metal instead of utilizing castings for this purpose as has heretofore commonly been done.

Another object of the invention is to reduce the time and labor required in the formation of valve cages and the like by eliminating the necessity of using a finishing tool or method to smooth off the interior wall of the finished article.

Other objects, advantages and features of invention may hereinafter appear.

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

Fig. 1 is a combined elevation and half sectional view of the molded form or blank before drilling operation has been performed thereon. The sectioned portion of this view is taken on line 1—1 of Fig. 2.

Fig. 2 is a cross section on line 2—2 of Fig. 1.

Fig. 3 is a combined elevation and half sectional view of the molded form or blank after the drilling operation has been performed thereon. The sectioned portion of this view is taken on line 3—3 of Fig. 4.

Fig. 4 is a cross section on line 4—4 of Fig. 3.

Fig. 5 is a view, partly in side elevation and partly in vertical mid-section, showing the device in its operative position with a ball valve therein and a portion of a pump assembly included in the view.

Referring in detail to the drawings, the forged body shown comprises a cylindrical end or base portion 7 which is axially in line with, but spaced away from another cylindrical portion 8 of less diameter that forms the opposite end portion of the body. Said end portions 7 and 8 are united to each other in the finished article by means of a series of radially projecting longitudinally extending ribs 9. These ribs are preferably arranged in equal circumferentially spaced relation to each other, and in the finished article are separated from each other by the openings 10 which communicate with the cylindrical valve chamber 11 the axis of which coincides with the axis of the body as a whole.

Before the chamber 11 is drilled out the space to be occupied thereby is occupied by a solid portion 15 which is of less diameter than the diameter of the intended valve chamber. The body thus formed is drilled in an axial manner through its base or large end portion 7 and the bore is continued a sufficient distance to remove all of the solid part 15 and to extend into the tapered lower end 8*a* of the smaller cylindrical portion 8 the desired distance, desirably to about the point illustrated in the drawings. After this has been done a drill of greater diameter may be used to enlarge the outer portion of the bore formed by the drill first used, in order to provide the diametrically enlarged portion 17 below the valve chamber.

The completed valve cage is provided at its upper end with a socketed shank 19 which is attached to the lower end portion 20 of the pump rod.

The ball valve will be located within the chamber 11, and the seat member therefor will be secured within the enlarged bore portion 17.

In Fig. 5 the device is shown illustrated, by way of example, in an operative relation to a pump barrel 30 of the multiple check valve type. In this view an annular valve seat 31 is shown in the assembly held in place by the screw threaded portion 32 of the pump barrel and affording a seat for the ball valve 33. The entire structure shown is reciprocably supported by the pump rod 20.

Claims:

1. The method of constructing a valve cage which consists in forming a body having a base portion of greater cross sectional extent than the intended valve chamber, said body having, adjoining said base portion, a part some diameters of which are less and other diameters of which are greater than the

intended valve chamber; and finally forming a bore which extends through said base portion and also into said part having lessened diameters.

2. The method of constructing a valve cage which consists in forming a body with a base portion at one end and a longitudinally ribbed portion adjacent to said base portion, the diameter through the ribbed portion between the ribs thereof being less than the diameter of said base portion; and finally in boring through said base portion and into said ribbed portion thereby forming a chamber having side openings between said ribs.

3. The method of constructing a valve cage which consists in forming a generally cylindrical body, said body having depressions in the sides thereof which are spaced away from one end thereof, and finally in boring into and through said end of said body to a sufficient depth to provide in conjunction with them a chamber having side openings.

4. The method of constructing a valve cage which consists in forming a body having substantially cylindrical end portions axially in line with each other and spaced apart from each other, one of said cylindrical end portions being of greater diameter than the other, there being a plurality of longitudinal ribs located between said cylindrical end portions, the diameters of said body between said ribs being less than the diameter of the smaller of said cylindrical end portions; and finally in boring a chamber through the larger of said cylindrical end portions thence through said ribbed portion and into the smaller of said cylindrical end portions, the diameter of the bore being greater than the diameter of the ribbed portion of the body between the ribs thereof.

In testimony whereof I hereunto affix my signature.

EDWARD E. STEVENSON.