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METHOD OF FORMING AND REENFORCING FLANGED APERTURES IN HOLLOW BODIES

Filed Dec. 12, 1929

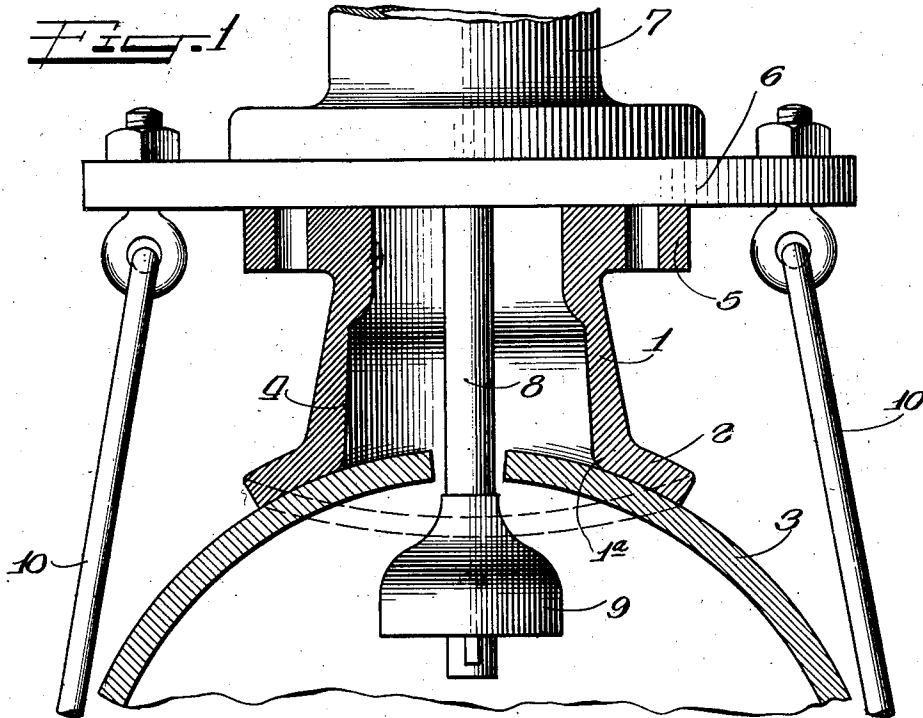


Fig. 2

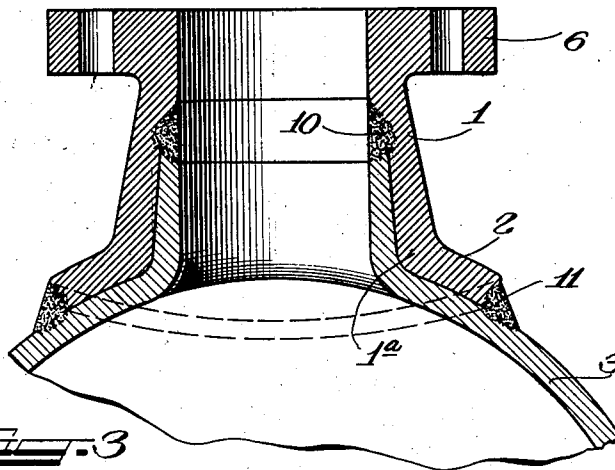
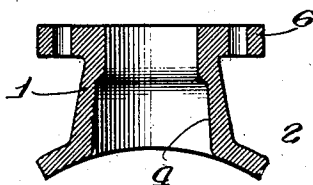


Fig. 3



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METHOD OF FORMING AND REENFORCING FLANGED APERTURES IN HOLLOW BODIES

Application filed December 12, 1929. Serial No. 413,498.

This invention relates to a method for forming and reenforcing flanged openings in hollow bodies.

In the manufacture of hollow bodies such as boilers or large pipes that have to resist great pressures and that contain large openings, the difficult problem heretofore has been to properly reenforce the hollow bodies at such openings to prevent rupture due to the great internal pressure. Generally, these openings are formed with an upstanding flange and the greatest stress occurs at the margin of such opening or near the lower portion of the flange.

It is an object of this invention to provide a new and efficient method and means for reenforcing such flange at the point of greatest or critical stress.

The invention comprises the novel method and product hereinafter described and more particularly pointed out and defined in the appended claims.

In the accompanying drawing which illustrates a preferred form of this invention and in which similar reference numerals refer to similar features in the different views:

Figure 1 is a fragmentary vertical sectional view through a hollow body and reenforcing die member with the flanged hole forming mechanism shown in elevation.

Figure 2 is an enlarged fragmentary sectional view through the hollow body with the reenforcing die member welded thereto.

Figure 3 is a sectional view through the combined reenforcing and die member, upon a reduced scale.

According to this invention, a combined die and reenforcing member 1 is formed with a suitable base 2 to fit the curvature of the hollow body 3 which may be a pressure boiler or pipe. The base 2 and the angle or elbow 1^a thereof is made sufficiently durable and strong to withstand the pressure at the point of greatest stress. The reenforcing and die member is formed with an interior bore which tapers upwardly and inwardly and is of substantially frusto conical form. The upper part of the reenforcing die is in the form of a flange 5 which forms a seat for the usual

cover and also a seat for the hole flanging apparatus.

The flanging apparatus consists of a base portion 6 adapted to rest upon the flange 5, and a fluid cylinder 7 which extends therefrom. A piston rod 8 extends from this cylinder and this piston rod is provided with a flanging head 9. The base 6 is adapted to be anchored to the hollow body by means of a stirrup 10 or the like. The flanging mechanism has not been fully illustrated as such mechanism is old and well known.

In carrying out my method, after the reenforcing die is formed to resist the greatest stress as above set forth it is superposed upon the hollow body which usually has a small aperture to receive the piston rod, the wall of such aperture is then expanded or flanged against the interior wall of the die as shown in Figure 2 and this is done by an upward movement of the flanging head 9. As the flanging operation is carried out, the flange will stretch and become thinner toward its upper portion, and for this reason the inward taper on the reenforcing die has been provided. After the flanging operation has been completed, the reenforcing die is welded to the flange of the opening as indicated at 10, and the base flange 2 thereof is welded to the hollow body as indicated at 11.

It will be appreciated that the reenforcing die 1 due to its reenforcing base flange 2 and the elbow 1^a will effectively resist the critical stresses which usually occur at the lower end of the opening and tend to rupture the vessel. Further the weld 10 is above such elbow and avoids practically all of the severe stresses in the hollow body.

I am aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted hereon otherwise than necessitated by the prior art.

I claim as my invention:

1. The method of forming and reenforcing a flanged aperture in a hollow body which consists in forming an aperture in said hollow body, forming a nozzle with a flange of

increased thickness to fit the curvature of said hollow body adjacent said aperture, superposing said nozzle upon said hollow body, flanging the wall of said aperture
5 against the interior surface of said nozzle, welding the upper portion of said flanged wall to said nozzle and the lower flange of said nozzle to said hollow body.

2. The method of forming and reinforcing a flanged aperture in a hollow body which consists in forming a combined die and reinforcing member with a thickened flange to fit the hollow body and a central passage with an enlarged lower tapered portion,
15 forming an aperture in said hollow body, superposing said member upon said hollow body, flanging the wall of said aperture against the wall of said enlarged tapered portion flush with the unenlarged passage
20 in said member, and welding said flanged wall to said member and the flange of said member to said hollow body.

In testimony whereof I have hereunto subscribed my name at Chicago, Cook County,
25 Illinois.

JAMES HALL TAYLOR.

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