T. J. WELDON.

REINFORCEMENT FOR MANHOLES FOR BOILERS AND PRESSURE TANKS.

APPLICATION FILED MAR. 17, 1911.

999,613. **Patented Aug. 1, 1911.**

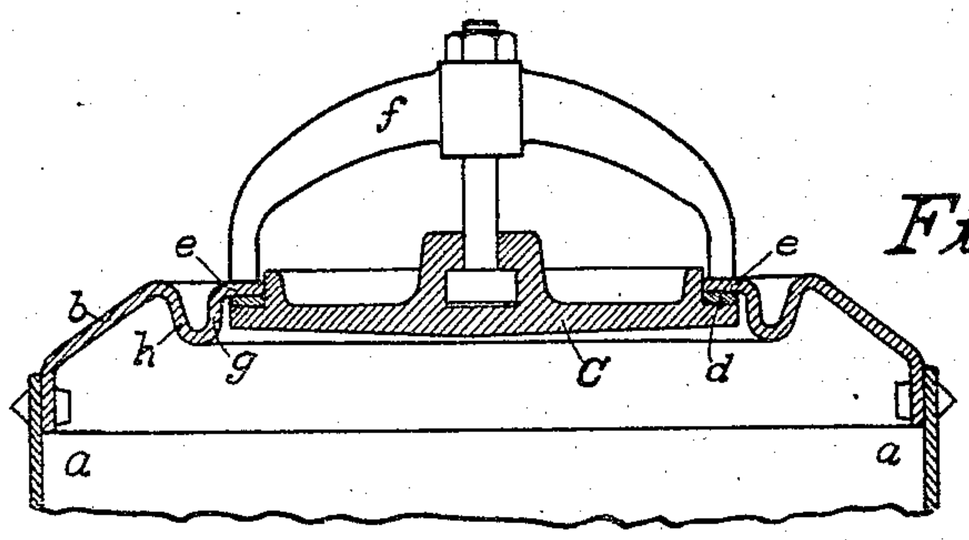

Fig. 1.

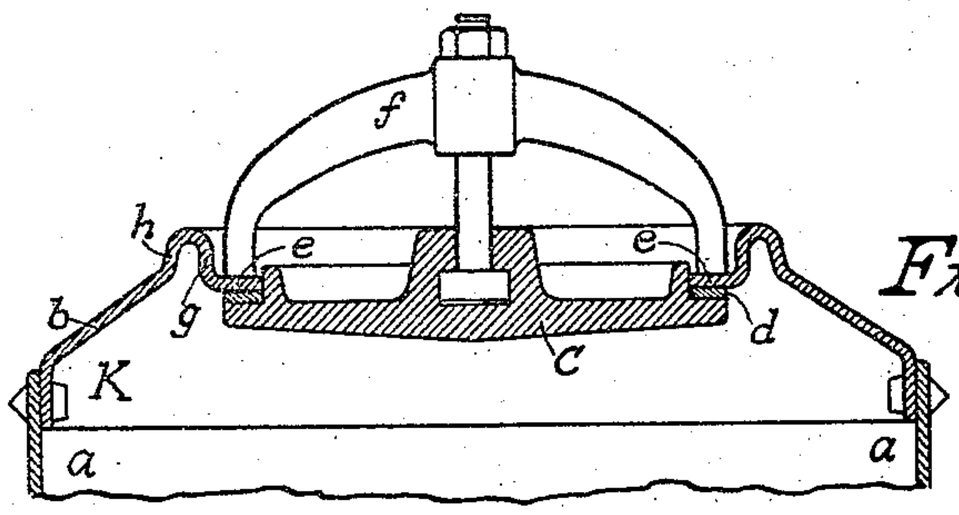

Fig. 2.

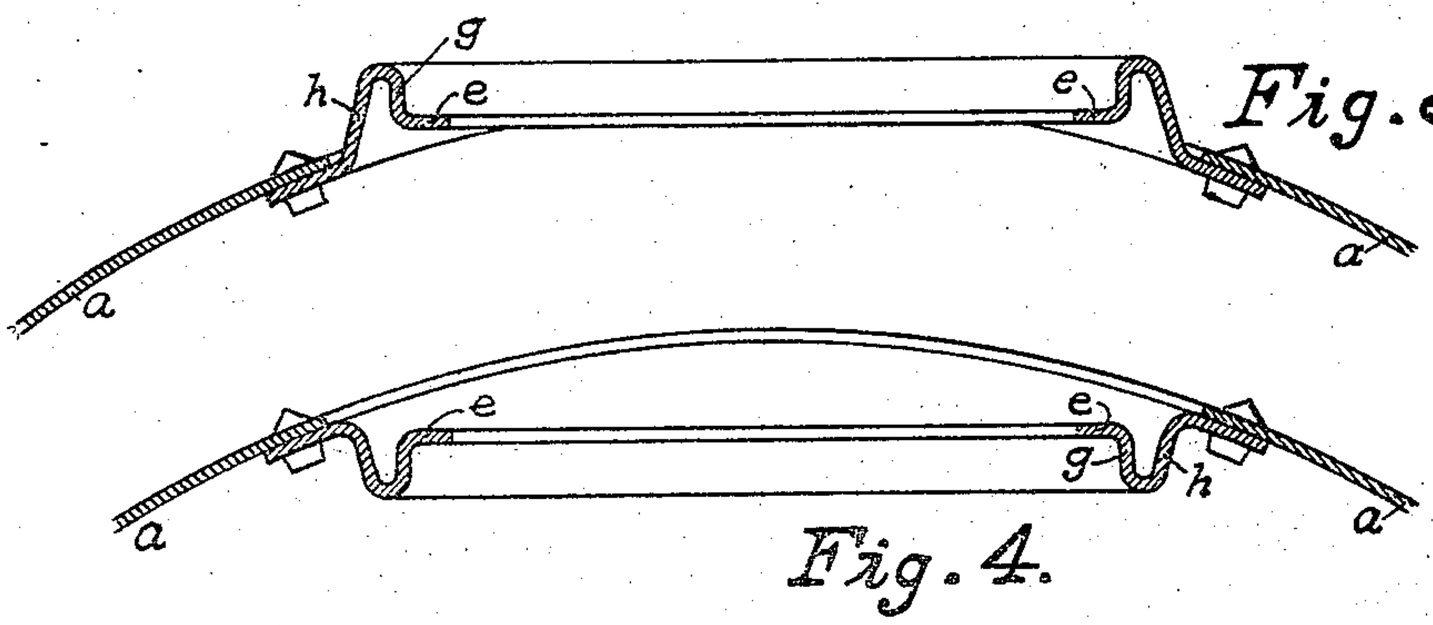

Fig. 3.

Fig. 4.

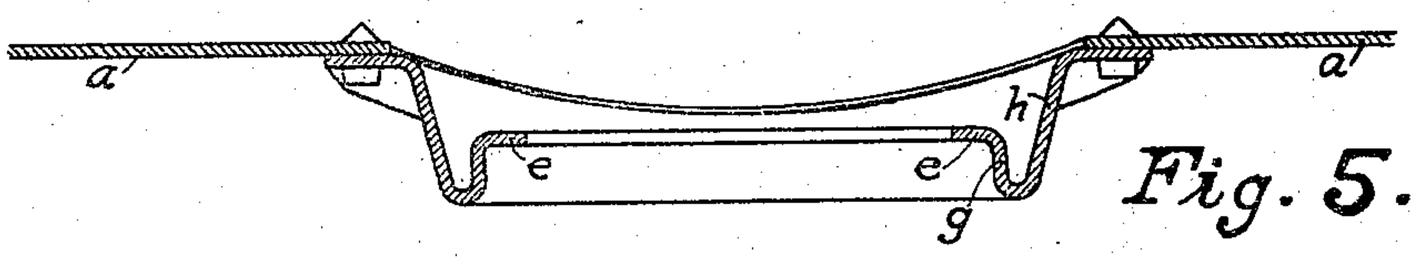

Fig. 5.

WITNESSES

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UNITED STATES PATENT OFFICE.

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REINFORCEMENT FOR MANHOLES FOR BOILERS AND PRESSURE-TANKS.

999,613. Specification of Letters Patent. Patented Aug. 1, 1911.

Application filed March 17, 1911. Serial No. 614,985.

To all whom it may concern:

Be it known that I, THOMAS J. WELDON, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Form of Reinforcement for Manholes of Boilers and Pressure-Tanks, of which the following is a full, clear, and exact description.

The objects of my improvement are to provide a wide perfectly flat surface for the seating of a manhole plate gasket, to provide an increased stiffening or reinforcement in the sheet or plate surrounding the manhole to counteract the weakening of the sheet caused by cutting the manhole, to so form this reinforcement that it may either extend into the boiler or outward therefrom as the exigencies of different cases may require, and still afford a flat and perfect seat for the gasket. I attain these objects by the device illustrated in the accompanying drawing forming a part of this specification, in which—

Figure 1 shows in cross section my improved manhole in a pressure tank head with the reinforcement flanges turned inward. Fig. 2 shows in cross section a similar tank head with the flanges turned outward. Figs. 3 and 4 show cross sections of manhole saddles riveted to the shell of a boiler, the former having the reinforced flanges turned outward from the boiler, and the latter having them turned inward, and Fig. 5 shows a cross section through the saddle of the manhole shown in Fig. 4 but taken longitudinally of the boiler.

In all the figures *a* represents the shell of the boiler or pressure tank. In Figs. 1 and 2 *b* refers to the head of the pressure tank therein shown. *c* is the manhole plate or cover provided with the approved flat and wide gasket *d*. *e* is the portion of the boiler head or the saddle which immediately surrounds the manhole and this portion of the plate must be as wide as the gasket and capable of affording a perfectly flat seat for the gasket. The feet of the yokes *f* bear on the gasket seating rim *e* directly opposite to the gasket.

In order to reinforce the plate in which the manhole is cut, and compensate for the weakness necessarily involved in cutting away so much of the material, I surround the gasket seating rim *e* with a double flange in the plate, the two parts of which are designated by *g* and *h*. By this means the three flanges *e*, *g* and *h*, are each disposed edgewise to the strains acting on them. In flanging metal plates the metal is stretched or drawn, and wherever this drawing occurs the plate is of course made thinner. The flanging may be done so that all the stretch occurs in one particular part and even along an edge. In my improved manhole however the stretching or drawing of the metal is divided between the two flanges *g* and *h*, and is the greatest on the semi-circular bend connecting *g* and *h*. This bend from *g* to *h* however is the strongest part of the device due to its form and in spite of its thinner section. There is no excessive drawing on the gasket seat *e*, only enough to equalize that on the flanges *g* and *h*, thus preventing the draw or stretch being excessive at any one place.

When a manhole is to be placed in the shell of a boiler, it is preferable to form the manhole in a separate plate or saddle as it is termed and rivet this saddle to the boiler shell as shown in Figs. 3, 4 and 5. Here again, as in the case of a manhole in the head, the flanges *g* and *h* may be turned outward as in Fig. 3, or inward as in Fig. 4.

The form shown in Fig. 3 is the preferable form for the smaller sizes of horizontal boilers as it leaves so much more room for a man's entrance between the shell and the top of the boiler tubes.

The form shown in Fig. 2 is particularly advantageous when the manhole is placed in a large flat boiler head, as, the flanges being turned outward, access to the rivets joining the head to the shell at *k* Fig. 2, is not at all obstructed, as may be the case when the flanges are turned inward.

The essential characteristics of my improved manhole are summarily stated, a wide flat gasket seat on both sides of the plate surrounding the manhole, the feet of the yokes bearing directly opposite to the gasket, the use of standard sizes and forms of manhole plates and yokes, obviating of excessive drawing of the metal at any one place, disposing the three flanges surrounding the opening edgewise to the strains, and turning the flanges either inward or outward as particular conditions may require.

Having now fully described my invention, what I claim is—

1. A reinforcement for manholes for boilers, pressure tanks and the like, consisting of an endless flange, as *h*, forming an angle with the boiler plate, a second endless flange, as *g*, internal of the first and connected thereto by an endless semicircular bend, and a third flange, as *e*, internal of the second and extending transversely to the other two flanges forming on either side thereof a wide flat seat for the gasket of the manhole plate and forming on the opposite side to the gasket seat a bearing surface for the yoke.

2. In a boiler or other pressure tank provided with a manhole, a strip of flat metal surrounding the hole, of the width of the ordinary flat manhole gasket, to form a gasket seat, said gasket seat being connected to the surrounding boiler plate by two annular flanges extending transversely to said gasket seat and the boiler plate and connected together, all being formed integrally of the boiler plate.

In testimony whereof I have signed this specification in the presence of two witnesses.

THOMAS J. WELDON.

Witnesses:
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FRED C. KELLER.