(No Model.) 2 Sheets—Sheet 1.

W. FORGIE.

CONSTRUCTION OF TANKS.

No. 492,001. Patented Feb. 21, 1893.

Fig. 1.

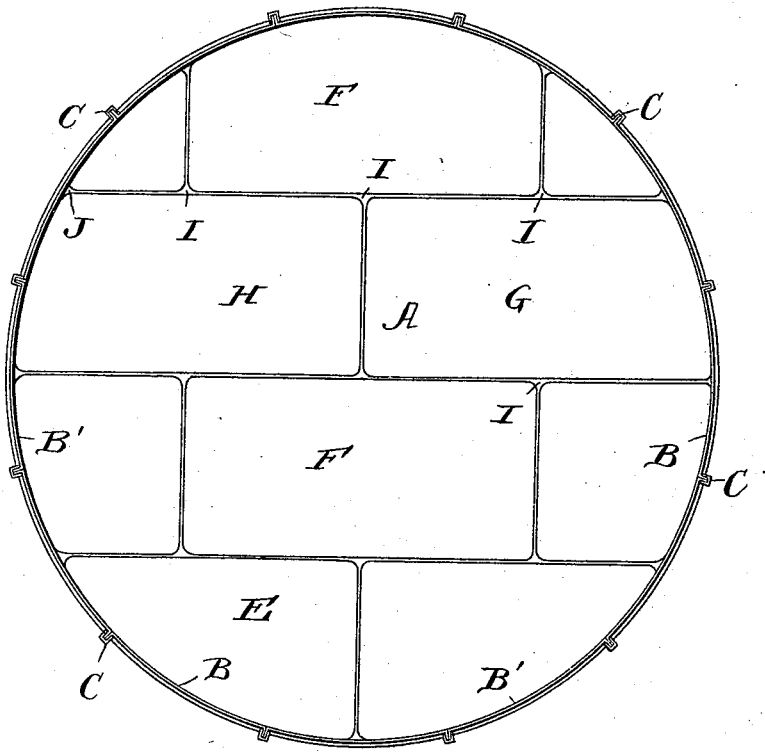
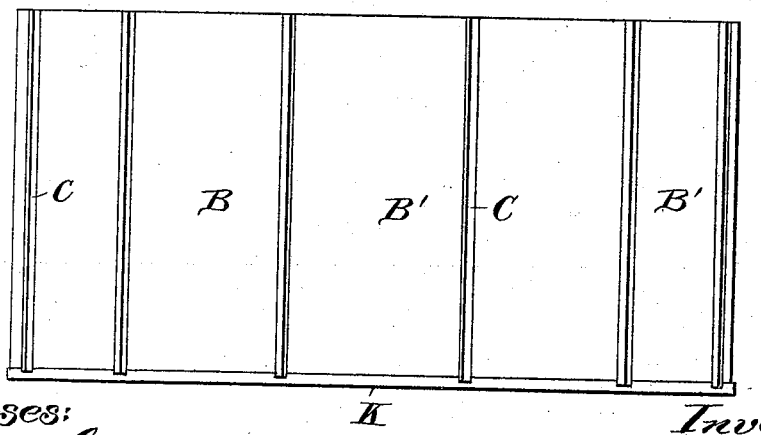


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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CONSTRUCTION OF TANKS.

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Fig. 3.

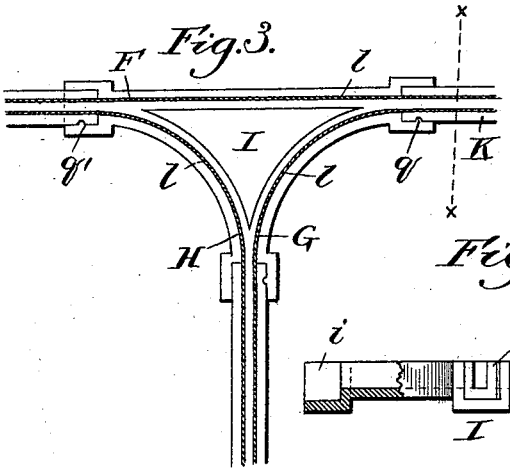

Fig. 5.

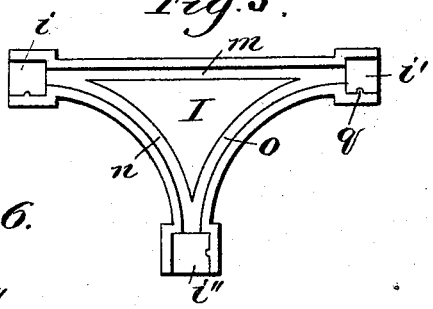

Fig. 6.

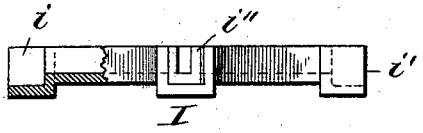

Fig. 4.

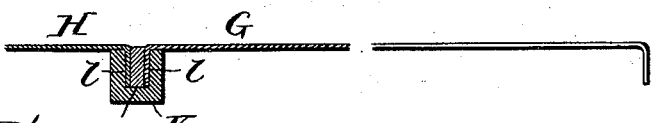

Fig. 7.

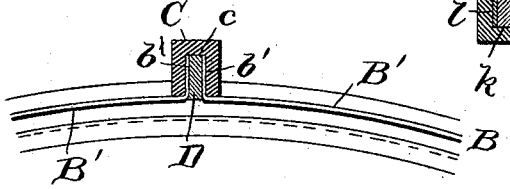

Fig. 8.

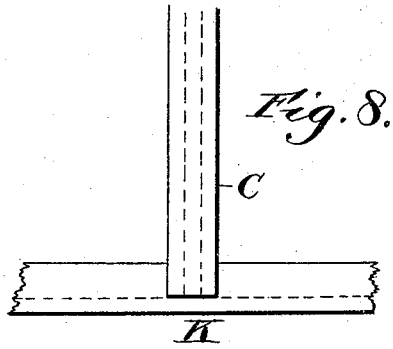

Fig. 9.

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UNITED STATES PATENT OFFICE.

WILLIAM FORGIE, OF WASHINGTON, PENNSYLVANIA.

CONSTRUCTION OF TANKS.

SPECIFICATION forming part of Letters Patent No. 492,001, dated February 21, 1893.

Application filed May 24, 1892. Serial No. 434,232. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM FORGIE, a citizen of the United States, and a resident of Washington, in the county of Washington and State of Pennsylvania, have invented certain new and useful Improvements in the Construction of Tanks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Heretofore in the construction of tanks designed to contain fluids it has been customary to flange and punch the edges of the plates or sections and rivet or bolt the same together; but such construction requires that plates of a certain strength be employed to compensate for weakening of the plates due to punching the same in order to unite them by bolts or rivets.

It is the object of the present invention to obviate the detrimental punching of the flanged plates or sections, and to unite the parts in a novel manner which not only secures the greatest possible strength and durability but also enables me to use plates of lighter weight without impairing the stability of the structure, thus reducing the cost of construction.

With these ends in view, the invention consists, generally, in a tank having its plates or sections joined by a seam of which the flanges on the adjacent sections or plate form a part, and a connecting bar having in one side thereof a groove in which the flanges are fitted and secured by calking the joint, said calking being tightly forced between the flanges of the sections and lying flush with or below the surface of the sections.

In the detailed construction of the bottom of either head of the tank I employ an angle plate in conjunction with the grooved straight bars, each angle plate being common to three sections and having two diverging grooves and a straight groove which receive respectively the deflected flanges on two sections and the straight flange on the third section, said flanges being calked tightly in the grooves of said angle plate; and a further improvement consists in having the ends of the straight grooved bars secured in the ends of the angle plate, the whole forming a very tight, secure, joint and connection for the series of plates or sections.

The invention further consists in the novel construction, arrangement and adaptation of parts as will be hereinafter fully described and claimed.

The accompanying drawings fully illustrate my invention, in which—

Figure 1 is plan view showing the general form of the head or bottom of the tank. Fig. 2 is a side elevation thereof. Fig. 3 is an enlarged detail view, showing by transverse section the flanges of the tank-sections or plates in one grooved angle-plate and three grooved straight bars which are fitted in the sockets of the angle plate. Fig. 4 is a section on the line x—x of Fig. 3. Figs. 5 and 6 are detail views, in plan and edge elevation, of the angle plate, and Fig. 7 is a plan view of the grooved straight bar. Figs. 8 and 9 are detail views in cross section and elevation respectively, of the vertical seams of the tank.

Like letters of reference denote corresponding parts in the several figures of the drawings, referring to which—

A designates the bottom or one of the heads of the tank, and B is the vertical shell thereof which is preferably made cylindrical in form as usual. The shell is composed of a series of segmental plates or sections B′ which are preferably of such length as to extend from the top to the bottom of the tank, and these vertical sections are united by longitudinal vertical seams of the following construction. The adjacent edges of the sections or plates are bent nearly at right angles to form the flanges b, b', and said flanges are fitted in the longitudinal groove or recess c formed in one face of the vertical bar C which is arranged outside of the shell of the tank and bears or fits closely against the outer face of the plates or sections thereof. The flanges are permanently secured in the groove of the bar by means of calking D, of any preferable material, which is forced tightly in the space between the flanges b, b', of the plates B′ and which lies within or flush with the faces of said sections or plates B′.

The bottom or head A of the tank is built up or composed of a series of plates or sections E, F, G, H, which are arranged in flat horizontal positions; and each plate or sec-

tion has its edges bent at right angles to the body of the plate, such flanges of the sections being also bent at the corners thereof in a peculiar manner to adapt them to be seated in the grooves of the angle plates I, J, which unite the corners of the sections and which also have the ends of the straight bars K interlocked therewith. The straight bars K are arranged along the straight side edges of the sections or plates of the bottom, and in the upper side of each bar is formed a longitudinal groove *k* which receives the flanges *l* on the straight side edges of the adjacent bottom-sections for which said bar is provided. The angle plates I are used to connect the corners of the plates within the edges of the bottom or head, while the angle plates J are arranged at the edges of the bottom or where the bottom and vertical shell are joined. The angle plates I are each made substantially triangular in form, or with three corners, as at *i*, *i'*, *i''*; and in one face of said plate are provided three grooves or recesses *m*, *n*, *o*, the groove *m*, being straight and extending from the corner *i* to the corner *i'*; the groove *n* extending from the corner *i* to the corner *i''*, and the groove *o* extending between the corners *i'*, *i''*.

The angle plate I is arranged for example, at the juncture of the plates F, G, H, and the flanges of the plates are fitted in the grooves of said angle plate as follows:—The flange of the plates E and F are deflected or curved and fitted in the converging grooves *n*, *o*, of the angle plate while the flange of the plate G is made straight and fitted in the straight groove *m* of the angle plate. After the parts have been properly adjusted, the joints are calked by forcing the calking materials in the grooves and against the flanges, thus providing a tight strong joint without weakening the plates or sections by punching and riveting the same. At the corners, each angle plate is enlarged and provided with a socket *p* of such diameter as to receive one end of the straight bar K, and said bar is united securely to the angle plate by means of a teat *q* on the inner side of the socket fitting in a notch *q'* in the side of the bar, as is obvious.

The lower edges of the vertical sections or plates B' forming the shell of the tank are fitted in grooves in segmental bars L which are arranged below the shell, said edges of the vertical plates and the outer flanged edges of the outside plates of the bottom or head A being calked in the grooved bars L; and the adjacent ends of each pair of segmental bars are fitted in sockets *p* formed in the ends of the angle plates J, the other end of the angle plate J receiving the straight bar K provided for the lower edge of the bottom-plate E. The vertical seams which unite the sections of the shell B are arranged between or to break joints with the seams in the bottom A, and the vertical grooved bars are seated and tightly secured in sockets or recesses in the peripheral bars, as shown.

A tank constructed as herein described has its sections united together by exceedingly simple and secure joints which possess great strength and durability; and inasmuch as the plates or sections are not punched and riveted I am enabled to increase the strength of the tank and utilize in the construction thereof plates or sections which are lighter than would be required for a tank of the same capacity constructed in the ordinary manner.

I am aware that changes in the form and proportion of parts and details of construction of the devices herein shown and described as an embodiment of my invention can be made without departing from the spirit or sacrificing the advantages of my invention, and I therefore reserve the right to make such changes and alterations as fairly fall within the scope of the same.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In the construction of tanks, the vertical plates or sections flanged at their adjacent edges, the grooved bars having said flanges calked therein, and the peripheral grooved bars which receive the flanges on the lower edges of the sections or plates, as and for the purpose described.

2. In the construction of tanks, the combination of the flanged vertical plates of the shell, the flanged horizontal plates of the head or bottom, the peripheral grooved bars at the lower and outer edges of said plates or sections, the vertical grooved bars which receive the flanges on the vertical plates, and the angle plate between the peripheral and vertical grooved bars, substantially as described.

3. In the construction of tanks, the combination with the plates or sections, of the angle plates having the grooves which receive the flanges of three sections, said sections having their flanges calked in grooves or seats of the angle plates, as and for the purpose described.

4. In the construction of tanks, the angle plate having the diverging grooves intersecting with the ends of a straight groove, combined with sections having their flanges adapted to the diverging grooves and another section with its flange in the straight groove, said flanges being calked in the grooves of said angle plate, as and for the purpose described.

5. In the construction of tanks, the combination with the flanged sections, of the grooved angle-plate which receives the flanges at the corners of the sections, and the grooved bars united to said angle plate and receiving the flanges along the straight edges of the sections, said flanges being calked in the grooves of the angle plate and bars, as and for the purpose described.

6. In the construction of tanks, the angle plate having the grooves and the sockets in its corners, combined with the straight grooved bars fitted in the sockets of said an-

gle plates and secured to the same by the interlocking teat or fin and notch, and the sections or plates secured at their corners in the angle plate and along their side edges in the grooved bars, as and for the purpose described.

7. In the construction of tanks, the vertical sections having the flanged side edges united by a vertical grooved bar, the bottom or head sections united by the angle plates and the grooved horizontal bars, the segmental peripheral bars which receive the lower and outer edges of the shell and bottom, and the peripheral angle plates receiving the grooved horizontal and peripheral bars, as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM FORGIE.

Witnesses:
JOHN H. MURDOCH,
DAVID STERRETT.