2 Sheets—Sheet 1

T. B. RITER.

Portable Storage Tanks.

No. 212,983. **Patented Mar. 4, 1879.**

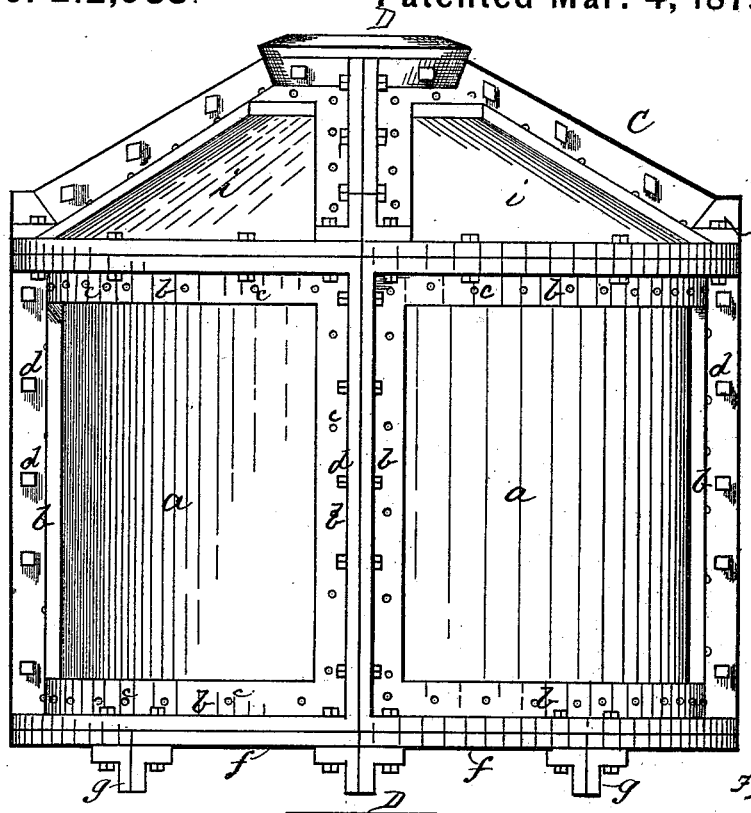

Fig. 1.

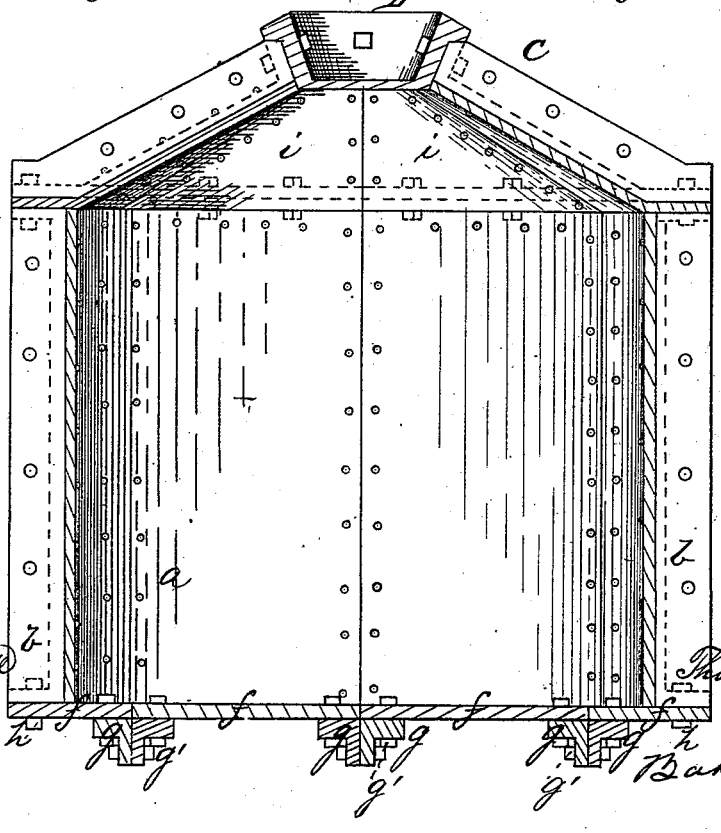

Fig. 2.

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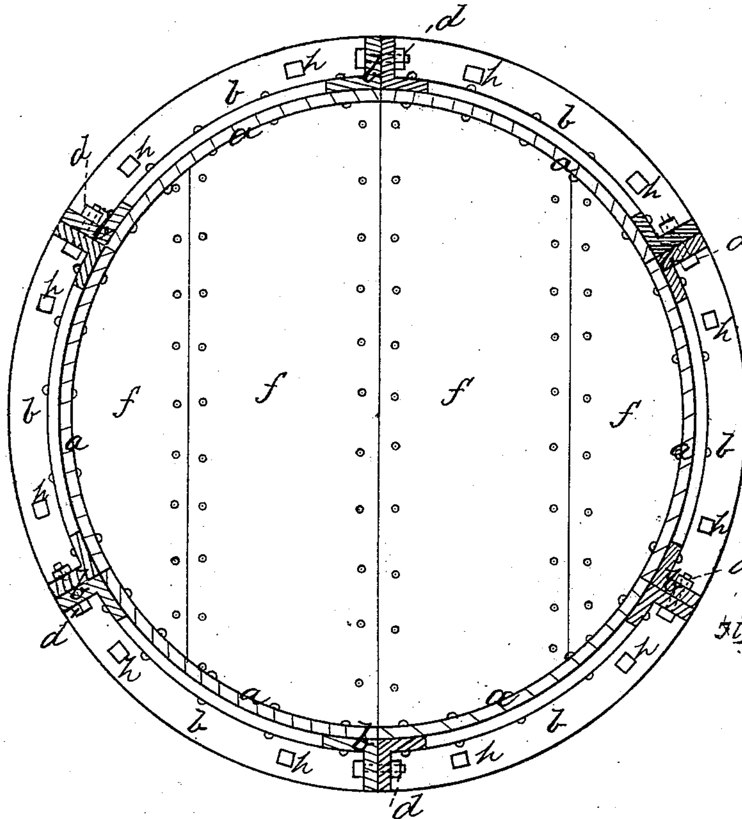

Fig. 3.

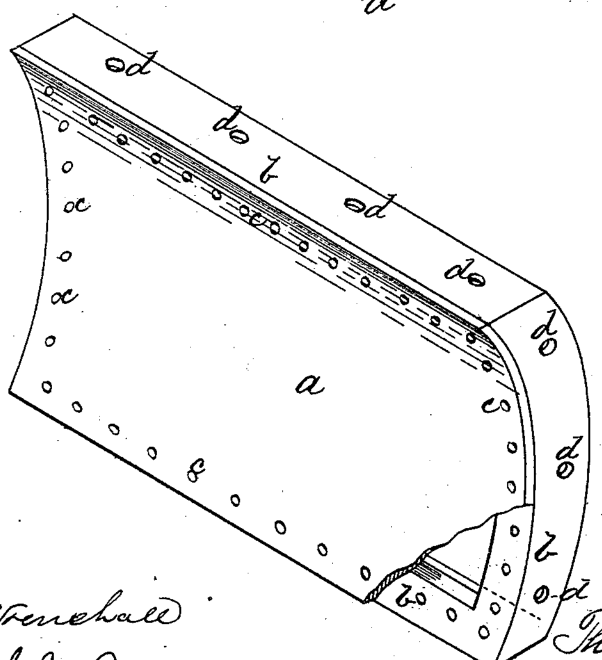

Fig. 4.

Witnesses_
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UNITED STATES PATENT OFFICE.

THOMAS B. RITER, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN PORTABLE STORAGE-TANKS.

Specification forming part of Letters Patent No. **212,983**, dated March 4, 1879; application filed August 29, 1878.

To all whom it may concern:

Be it known that I, THOMAS B. RITER, of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Portable Tanks for Storing Oil and other Liquids; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevation of a portable tank embodying my invention. Fig. 2 is a vertical section of the same. Fig. 3 is a horizontal section, and Fig. 4 is a detail view.

Like letters refer to like parts wherever they occur.

My invention relates to the construction of sectional tanks for the storage of oil, and for other purposes; and consists in a segment or section for the construction of oil and similar tanks, said section being of the general form or outline required by its location, whether in the bottom, top, or body of the tank, but of special construction—that is to say, composed of a plate devoid of angles or flanges, and secured to a border of angle-iron, with which a tight joint is formed in any suitable manner, but preferably by calking, as in boiler-building.

The main object of the present invention is to supply the oil-producer with convenient and durable portable tanks at a reasonable price.

The tanks now in general use in the oil region for the storage of oil are of two classes, namely, those ranging from five thousand (5,000) to twenty-five thousand (25,000) barrels, and those ranging from one hundred and fifty (150) to fifteen hundred (1,500) barrels. The first mentioned are the usual fixed storage-tanks, and are made from plates riveted and calked in the usual manner of forming boilers. They are quite expensive, owing to the amount of labor involved in riveting and calking, and as the size of the tank decreases the cost of manufacture (per barrel) increases, rendering it practically impossible to economically manufacture small tanks in the same manner. The second referred to is the small portable tank, and is in general constructed of wooden staves, hooped and otherwise coopered in the usual manner. Practically speaking, there is a limit in the size such tanks can be constructed to advantage, leaving a wide range, (between one thousand five hundred and five thousand barrels,) within which sizes no comparatively cheap and serviceably-constructed tank can be made. Moreover, with the best-constructed wooden tanks the loss is great from leakage. It is almost impossible to make them tight. And when such tanks once get to leaking they have to be coopered and gaged anew, which in itself is a matter of much trouble, annoyance, and frequently of loss.

So far as I am aware, there has not heretofore been devised any means of building such tanks or similar vessels, which combined cheapness in production, capability of being set up and taken down by inexperienced workmen, compactness when stored or during transportation, and capability of increasing or decreasing the capacity of the tank without affecting its general construction.

Certain constructions for analogous articles, which embody some but not all of the features indicated, have been heretofore devised, as, for instance, gasometers, &c., have been formed from sections consisting of flanged plates backed by independent pieces of angle-iron, which served to stiffen the structure and afford support in bolting the segments; but the main objection to such construction is that the plates require to be extra large in order to allow for the flanging; and it is well known to the manufacturer that as the size increases the number of perfect plates decrease and the loss from trimming increases. To this should be added the loss from waste metal in the flange, which adds nothing to the capacity of the tank. A minor objection is the difficulty of flanging curved plates.

Another instance of somewhat analogous construction is where barrels, &c., have been made in sections, such sections constituting half or quarter barrels formed of plate metal, strengthened by and connected to angle-iron; but in such instances the section constituted more than a single portion of the barrel or tank, (as, for instance, a portion of the body

and a portion of the head were combined in a single section, so that the size of the vessel was predetermined and unalterable.

The relation of the angle-iron to the plate (upon both surfaces) also compelled portions of the vessels to be packed from the interior, and the general form of the sections precluded packing or nesting to the best advantage.

Before proceeding to describe my invention more specifically, I distinctly disclaim the constructions recited in the foregoing review of the art.

I will now proceed to describe my invention, so that others skilled in the art to which it appertains may apply the same.

The form of the plate will be, as a general thing, determined by the position the segment or section is to occupy in the tank, as indicated by *a f i*, and its size will be determined by the number of segments into which that portion of the tank is to be divided and the capacity of the tank.

For the body of the tank a rectangular plate, *a*, of such size that a given number will form a tank of the required capacity, is selected and riveted by its edge or edges to a border, *b*, of angle-iron, as at *c c*, one surface of the plate being applied to one flange of the border *b*, (see Fig. 4,) and packed against the same to make a tight joint therewith in any suitable or well-known manner, but preferably by calking against the angle-iron in the same manner as the sheets of a boiler are calked. A series of the segments *a* may then be bolted together by the free flanges *d* of the angle-iron, to constitute the tank-body, a packing of paper, felt, rubber, or equivalent material being inserted between the sections to insure tight joints. One or more tiers of the sections *a* may be employed to increase at will the height of the body and the capacity of the tank.

The bottom of the tank is formed from similar plate metal bordered on one or more sides by the angle-iron, (here indicated by *g*,) to one flange of which the plate *f* is riveted, and a tight joint formed by calking or otherwise, as in case of the section *a* of the body of the tank. These sections will be trimmed so that when in position they will form a bottom corresponding to the shape of the tank, and as the periphery of the bottom will rest upon or against the angle-iron border of the body-sections *a*, and be sufficiently supported, angle-iron need not be applied thereto.

The cover-sections of the tank will be of a general quadrilateral form, as indicated by *i*, narrowing or tapering toward the center point of the cover, and are usually provided with the border of angle-iron only on three sides, the fourth side, as in the case of the bottom sections, being supported by the free flanges of the border of the body-sections *a*, when the fourth side border is omitted. If the cover C of the tank is composed of a single series of sections, as shown in the drawings, the border of angle-iron on the short side of the quadrilateral is preferably so shaped as to form the border of the man-hole D.

In forming the several sections or segments *a i f*, plate metal of any desired thickness may be employed, and a great saving of metal and time will result, as the loss of time and metal by flanging, &c., is avoided, and the work can all be done at the shop; but to still further decrease the cost of manufacture, I prefer to use plate metal as low as No. 16, (one-sixteenth of an inch,) which can readily be done, as the angle-iron border will support the plate and give a solid body to calk against.

The segments or sections having been constructed substantially as specified, (the general form, of course, varying, as and for the reason herein specified,) they may be nested in small space for purposes of transportation, and, when desired, the tank can be quickly set up by unskilled labor, any suitable number of tiers, *a*, being used in the body to obtain a tank of the desired capacity. The segments or sections are connected by bolting through the free flanges of the border, and the joints between the sections or segments are made tight by the interposition of packings of felt, rubber, paper, or equivalent material, as before specified.

Having thus set forth the nature and advantages of my invention, what I claim, and desire to secure by Letters Patent, is—

A segment or section adapted to form one portion of a tank or similar vessel, (as, for instance, the bottom, top, or body thereof,) said section or segment consisting of a plate provided with a border of angle-iron, to one flange of which the edge of the plate is secured so as to form a tight joint therewith, the plate being devoid of angle or flange, the whole constructed substantially as specified.

In testimony whereof I, the said THOMAS B. RITER, have hereunto set my hand.

THOMAS B. RITER.

Witnesses:
R. H. WHITTLESEY,
F. W. RITTER, Jr.