A. COURVOISIER.

PONTOON FOR RAISING SHIPS.

APPLICATION FILED APR. 25, 1918.

1,308,168.

Patented July 1, 1919.

4 SHEETS—SHEET 1.

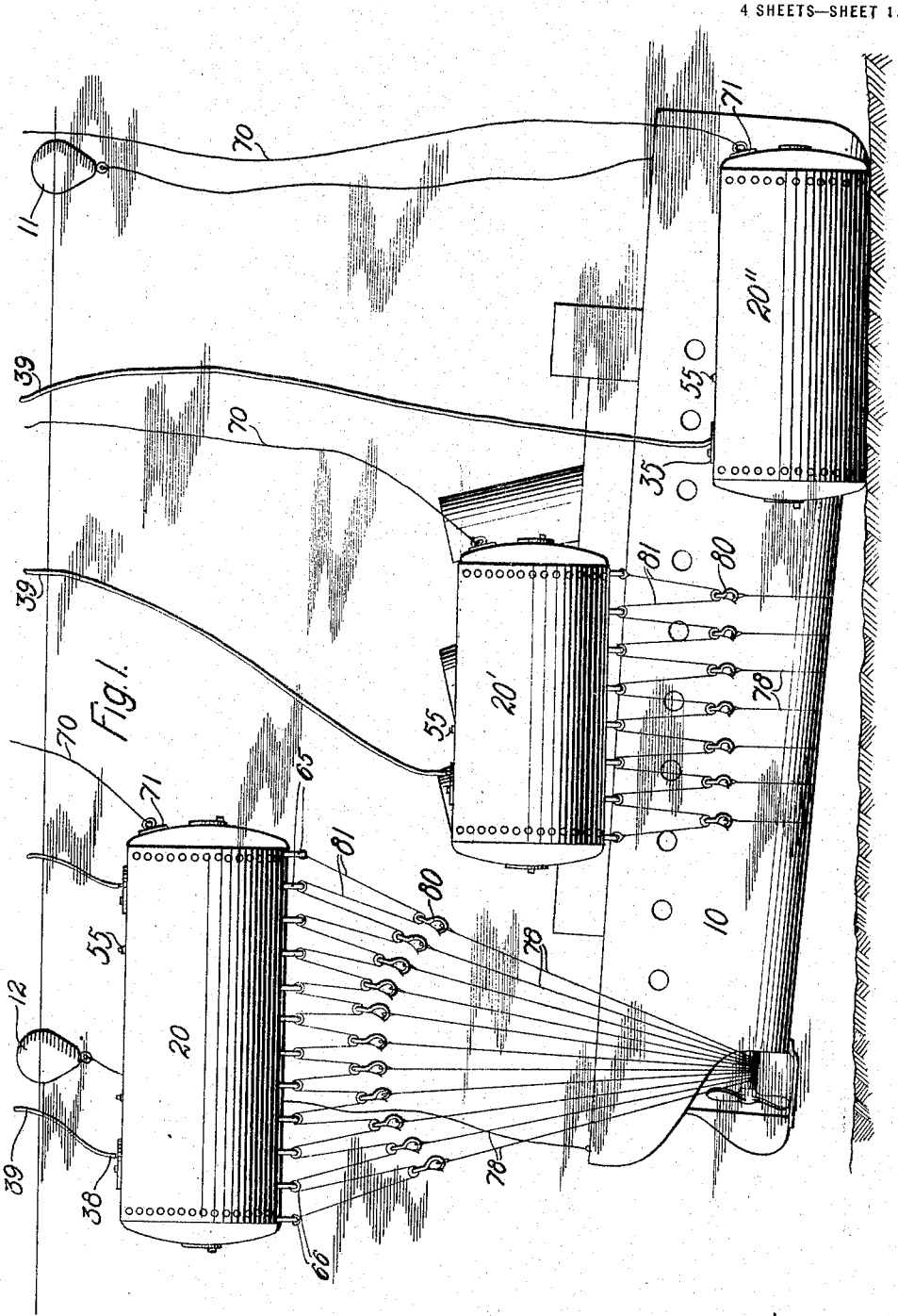

Fig. 1.

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Fig. 2.

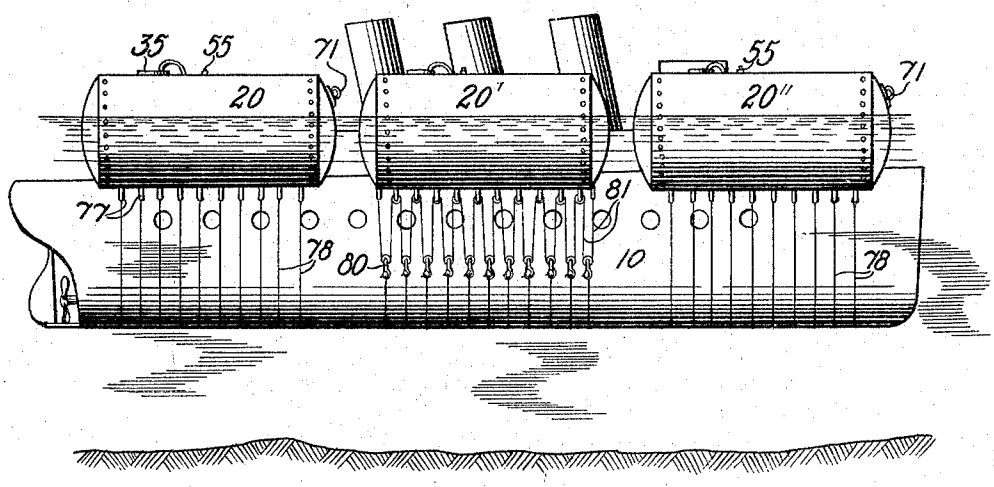
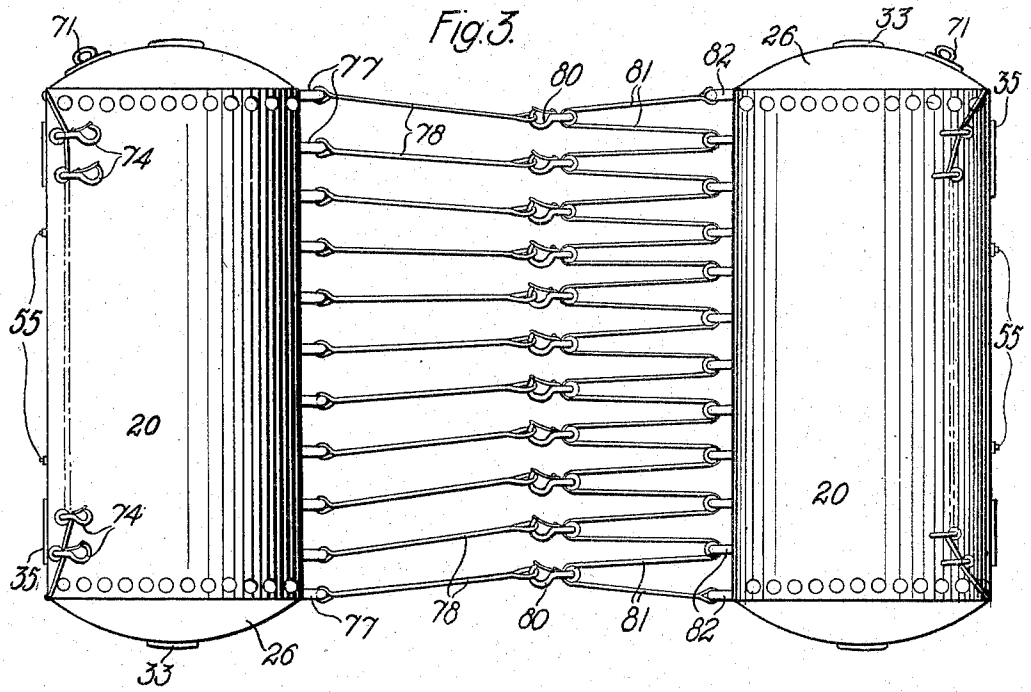


Fig. 3.



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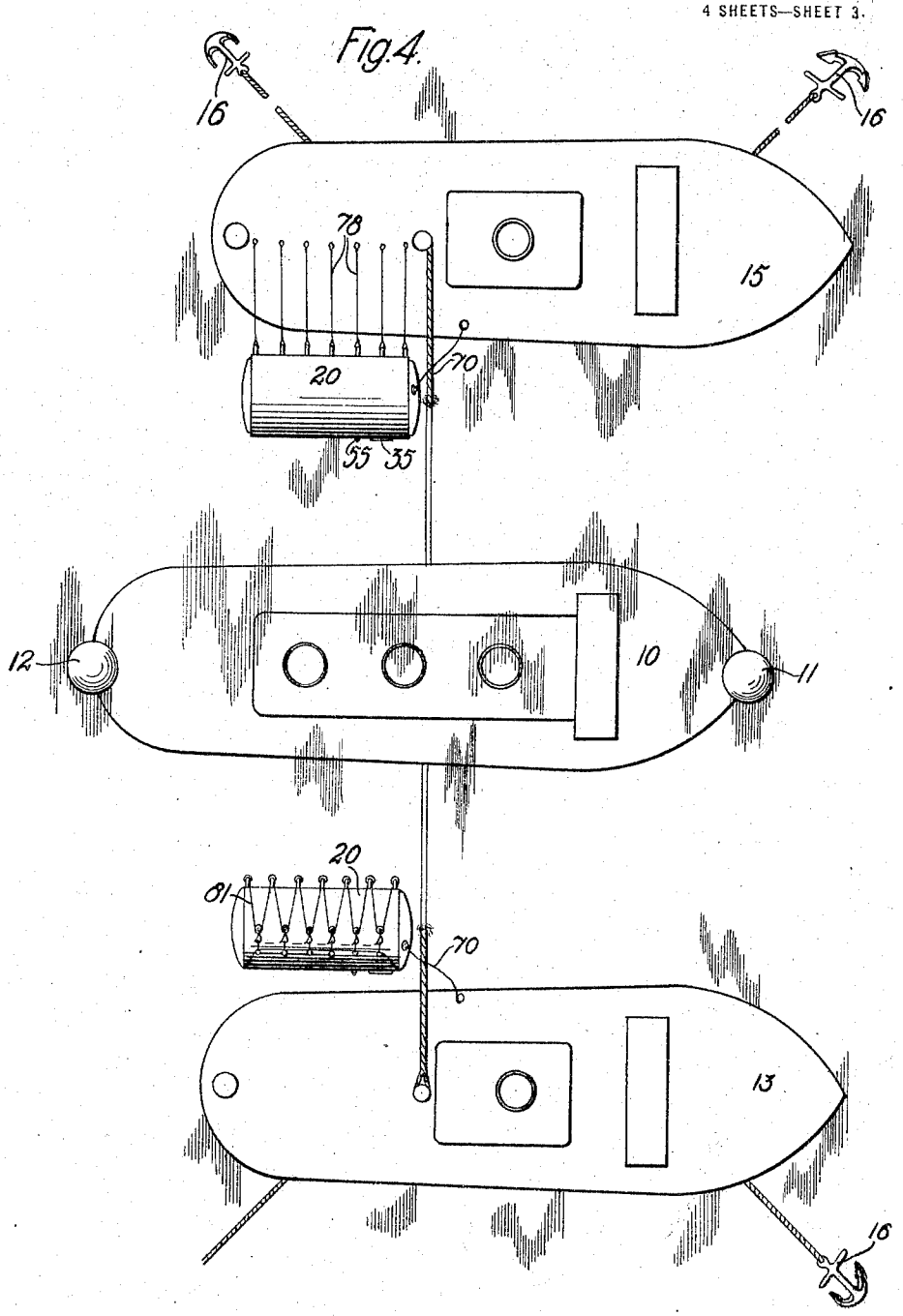
4 SHEETS—SHEET 3.

Fig. 4.



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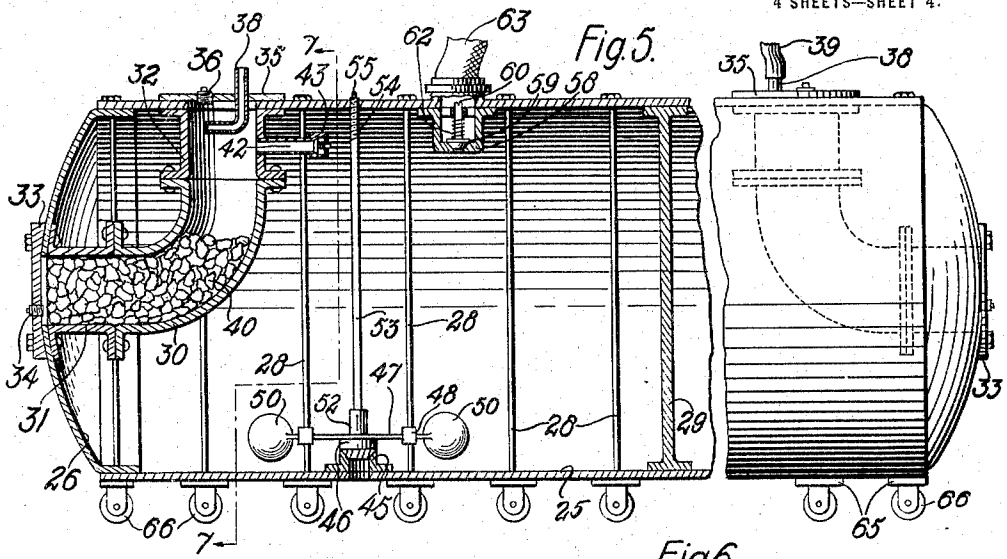

Fig. 5.

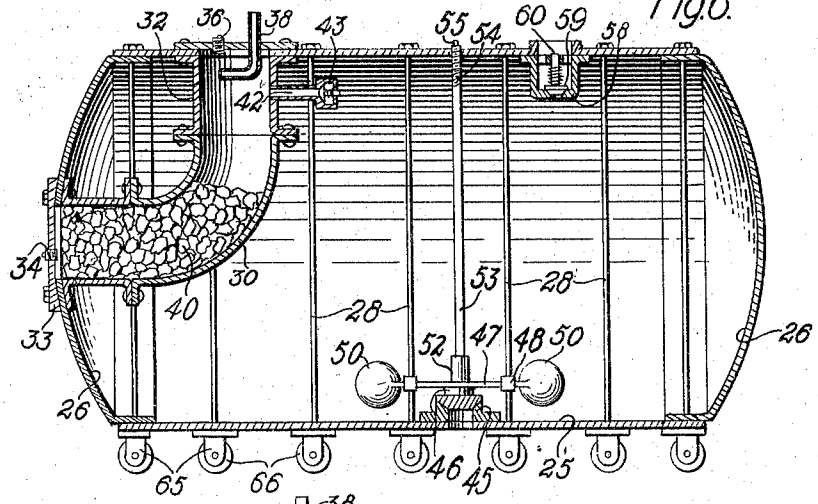

Fig. 6.

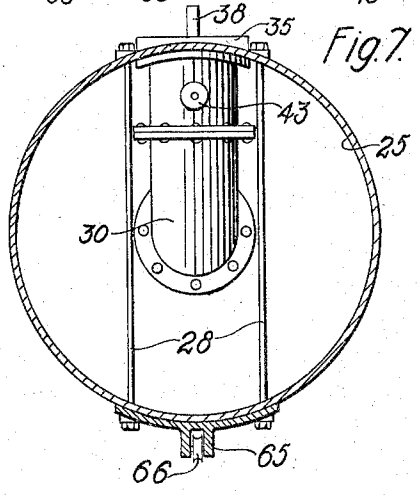

Fig. 7.

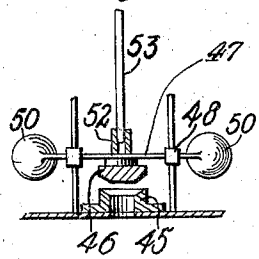

Fig. 8.

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UNITED STATES PATENT OFFICE.

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PONTOON FOR RAISING SHIPS.

1,308,168. Specification of Letters Patent. Patented July 1, 1919.

Application filed April 25, 1918. Serial No. 230,650.

To all whom it may concern:

Be it known that I, ANDREW COURVOISIER, a citizen of the United States, residing at Huguenot Park, county of Richmond, and State of New York, have invented certain new and useful Improvements in Pontoons for Raising Ships, of which the following is a specification.

This invention relates to improvements in salvaging sunken ships, and has as its special object, the provision of a plurality of tanks which are independently floatable, so that they may be sunk or caused to rise to the surface, together with a connecting harness of novel construction, whereby a sunken ship may be raised.

A further object is to provide means for expelling the water contained within the tanks and replacing the same with a light and buoyant gas.

These and other like objects are attained by the novel construction and combination of parts hereinafter described and shown in the accompanying drawings, forming a material part of this specification, and in which:—

Figure 1 is a side elevational view, showing a conventional type of ship in a submerged condition and indicating the application of the invention.

Fig. 2 is a similar view of the same, showing the ship supported by the tanks.

Fig. 3 is a plan view showing a pair of tanks and the interlacing elements engaged therebetween.

Fig. 4 is a plan view showing a sunken ship, together with a pair of tenders used in connection with the tanks, by which the ship is raised.

Fig. 5 is a partial side elevational and partial vertical sectional view taken through a double form of a tank.

Fig. 6 is a vertical sectional view taken through the center of a single type of tank.

Fig. 7 is a transverse sectional view taken on line 7—7 of Fig. 5, and

Fig. 8 is a fragmentary sectional view, showing the water valves in a raised position.

This process of raising sunken ships includes arranging a plurality of pairs of floatable tanks closely adjacent to the hull of the submerged ship, passing cables below the hull thereof from between each pair, and floating the tanks, thereby raising the ship to the surface.

The position of the sunken ship, indicated by the numeral 10, having been ascertained and defined by buoys 11 and 12, respectively at the bow and stern, the steamboats 13 and 15 used as tenders in maneuvering the tanks, are arranged alongside and above the sunken hull in the manner indicated in Fig. 4. These tenders are held in operative position by anchors 16, disposed in the ordinary manner.

As the sunken ship rests upon the bottom, more or less uneven and covered with silt and mud, preferably the stern end of the hull is first raised by passing cables below the propeller shaft housing and floating the tanks 20, thereby raising the hull sufficiently to permit the next pair of tanks 20′ to have cables extended between them, and so on until all of the pairs of tanks have been connected by cables extending below the keel of the sunken ship.

The construction of the tank elements is shown in detail in Figs. 5, 6 and 7, the same consisting of a cylindrical shell 25, having rigid convex ends 26, the shell being of such character as to withstand a deep sea pressure, and of sufficient area, when floated, to afford a powerful lifting effect.

The single type, indicated in Fig. 6, is ordinarily about twenty feet in diameter, and forty feet long, while the double type shown in Fig. 5, is of a length equivalent to three or more times its diameter. The shells are reinforced by carrying rods 28, arranged in pairs, while in the double type, a transverse air tight partition 29, forms the interior into two like but opposed compartments.

Arranged in one of the ends of the tanks, or in both ends, if the double construction be used, is a hollow elbow-like element 30, having a cylindrical flanged hollow extension 31, secured to the concave end of the tank, by the flange 33, provided with an opening filled normally by the plug 34.

The vertical flanged extension 32 is covered by a flange 35, containing an opening filled by the plug 36, while extending through the flange 35, is a pipe 38 engaged with a flexible hose 39, adapted to extend upward through

the water, when the tank is submerged, to the tenders 13 or 15, so that water may be supplied to the chemical, as calcium carbid 40, contained within the chamber 30, and extension 31, when it is desired to produce gas.

An outlet pipe 42 enters the vertical extension 32, and is provided with a check valve 43 at its outer end, the same being arranged so as to prevent the inlet of water to the pipe 42, but permits the gas rising from the carbid to pass into the tank so as to expel the water normally contained within, when it is desired to float the tank.

The water passes from the tank through the opening in the valve seat 45, rigidly secured upon the inner wall of the tank, at the bottom, while the conical valve 46, is engaged with a cross bar 47, upon which are secured blocks 48, slidably engaged upon pairs of the parallel disposed carrying rods 28, movement of the bar 47 being effected by the floats 50, engaged upon opposite ends of the bar 47.

Immediately above the valve 46, in a sleeve 52, receptive of the lower end of a rod 53, the rod being screw-threaded at its upper end 54, and engaged in a screw-threaded opening formed in the upper surface of the tank shell, the outwardly extending end 55 being fitted to receive a wrench. Normally the rod 53 is screwed home for holding the valve to its seat; however immediately prior to the submersion of the tank, the rod is unscrewed for allowing the valve to open during the submersion in order to gradually overcome the buoyancy of the floats by the weight of the inrushing water, until the same is expelled again under the influence of the developing gas.

In order to avoid danger of bursting the tank by an over charge of gas supplied by the calcium carbid, a safety valve is provided within the tank, the same consisting of a rigid cup 58, on the bottom of which is formed a seat coöperating with the valve 59, having a stem 60 guided in an appropriate housing, and pressed by the coiled compression spring 62, the action of the spring being sufficient to maintain a safe but adequate gas pressure within the tank, and in order to carry away an excess of gas when the safety valve operates, a hose 63 is secured to the upper extending portion of the valve, the hose leading away from the vicinity of the operation.

Secured at spaced intervals to the tanks are a plurality of brackets 65 in which are mounted rollers 66. The several tanks are normally secured to the tenders by cables 70 attached to eyes 71 in the ends of the tank.

The tanks are further provided with hook eyes 74, which engage cables, connected with the tenders, and upon the opposite sides of the tanks are other eyes 77, containing cable links 78, which may be connected with the hooks 80, between which are the interwoven ends of the cable 81, secured in eyes 82, fixed upon the side of the opposite pontoon.

In operation, one of each pair of the tanks is submerged, and a relatively small rope passed under the propeller housing, as being most convenient and which in turn draws a cable, eventually, down over the pulleys, and connected with the hooks, the cable being passed forward and back a number of times, below the housing, and so engaged with opposite hooks as to form a netting supporting that part of the ship.

The oppositely disposed tank of the pair is then submerged, and the cables tightened to any desired extent, whereupon water is permitted to enter the chamber 30, through the pipe 38 in sufficient quantity to produce an amount of gas which will enter into the tank, expelling the water and giving a buoyant effect, sufficient to raise that part of the ship.

Similarly the next pair of tanks is positioned and their cables passed below the keel of the vessel, at that time partially raised, and so on until all of the several tanks have been engaged with the hull, whereupon a larger quantity of water is permitted to enter the carbid chambers forming sufficient gas to raise the vessel into the position shown in Fig. 2.

Obviously the entrance of water to the carbid is under the control of operatives working on the tenders and the use for divers is only necessary in the original placing and installation of the cables below the hull, while the buoyant effect of the gas is amply sufficient to raise any weight to which the pontoons are attached, provided the latter be of adequate capacity.

In the construction of the tanks stay rods may be used to reinforce the construction, the same being applied in any desired manner and number.

In addition to the gas, or rather to take the place of gas, the pipe 38, or an equivalent of the same, may be used in conveying compressed air from the tenders to the tanks, so that should the supply of chemicals ordinarily used be deficient, the tanks may be rendered buoyant by the compressed air, it being understood that a pressure of substantially fifteen pounds per square inch, over the pressure of the water, at the depth to which the tanks are submerged, is required.

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

A device of the character described comprising a plurality of tanks, an elbow element in each of the tanks adapted to form a chamber for the reception of calcium carbid, a pipe connecting said elbow element with the body of the tank, a pipe within said elbow element adapted to be coupled to a flexi-

ble hose in permanent communication with the atmosphere, a check valve in said first named pipe, preventing the inlet of water but permitting the escape of gas from said element or chamber into the tanks, a valve at the bottom of each tank permitting the expulsion of the water normally contained in the tanks under the pressure of the gas passing the check valve, a safety gas valve on top of each tank, a plurality of brackets secured at spaced intervals to each tank, rollers mounted in said brackets, hook eyes on each tank, and cables connecting the hook eyes of the neighboring tanks.

In testimony whereof I have affixed my signature.

ANDREW COURVOISIER.