

No. 742,450.

PATENTED OCT. 27, 1903.

R. KRELL.

LIFTING APPARATUS FOR RAISING OR LOWERING CANAL BOATS, &c.

APPLICATION FILED MAR. 16, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

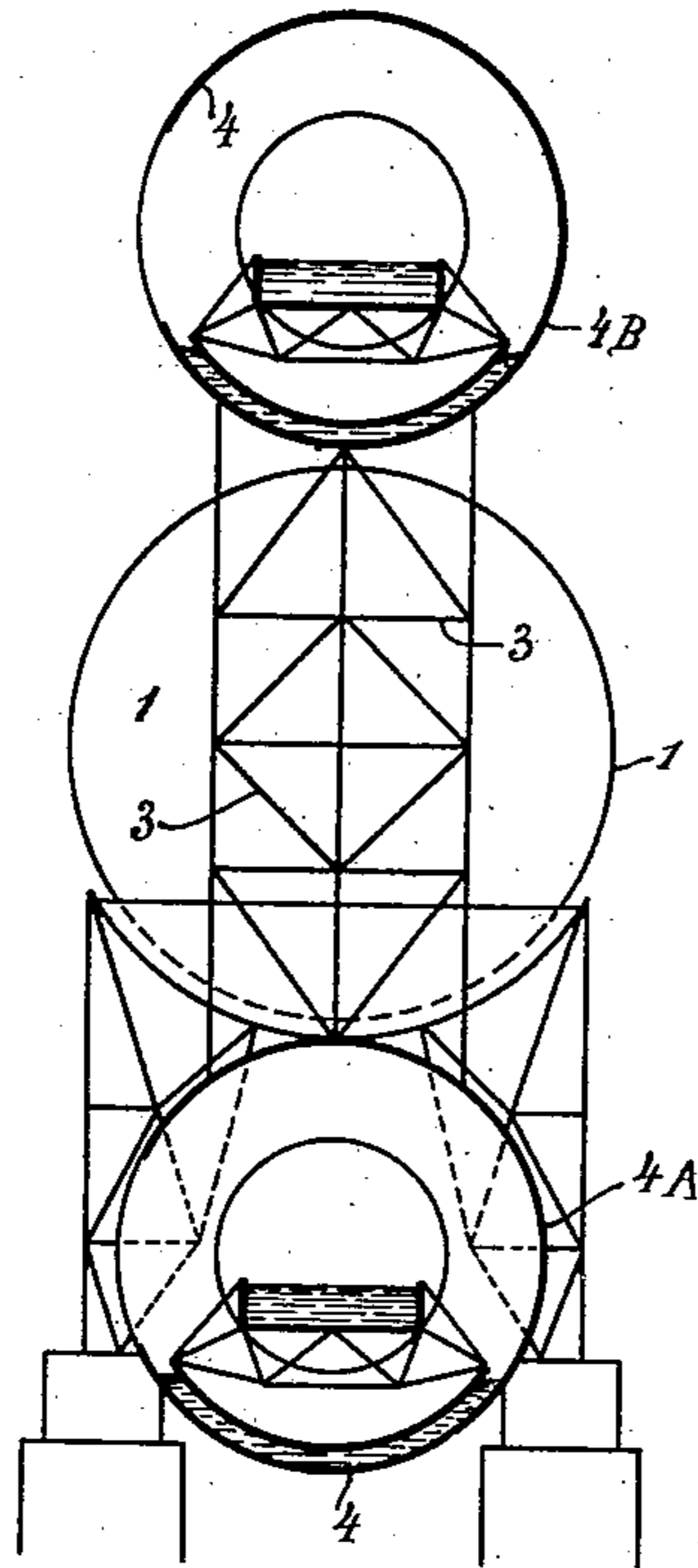
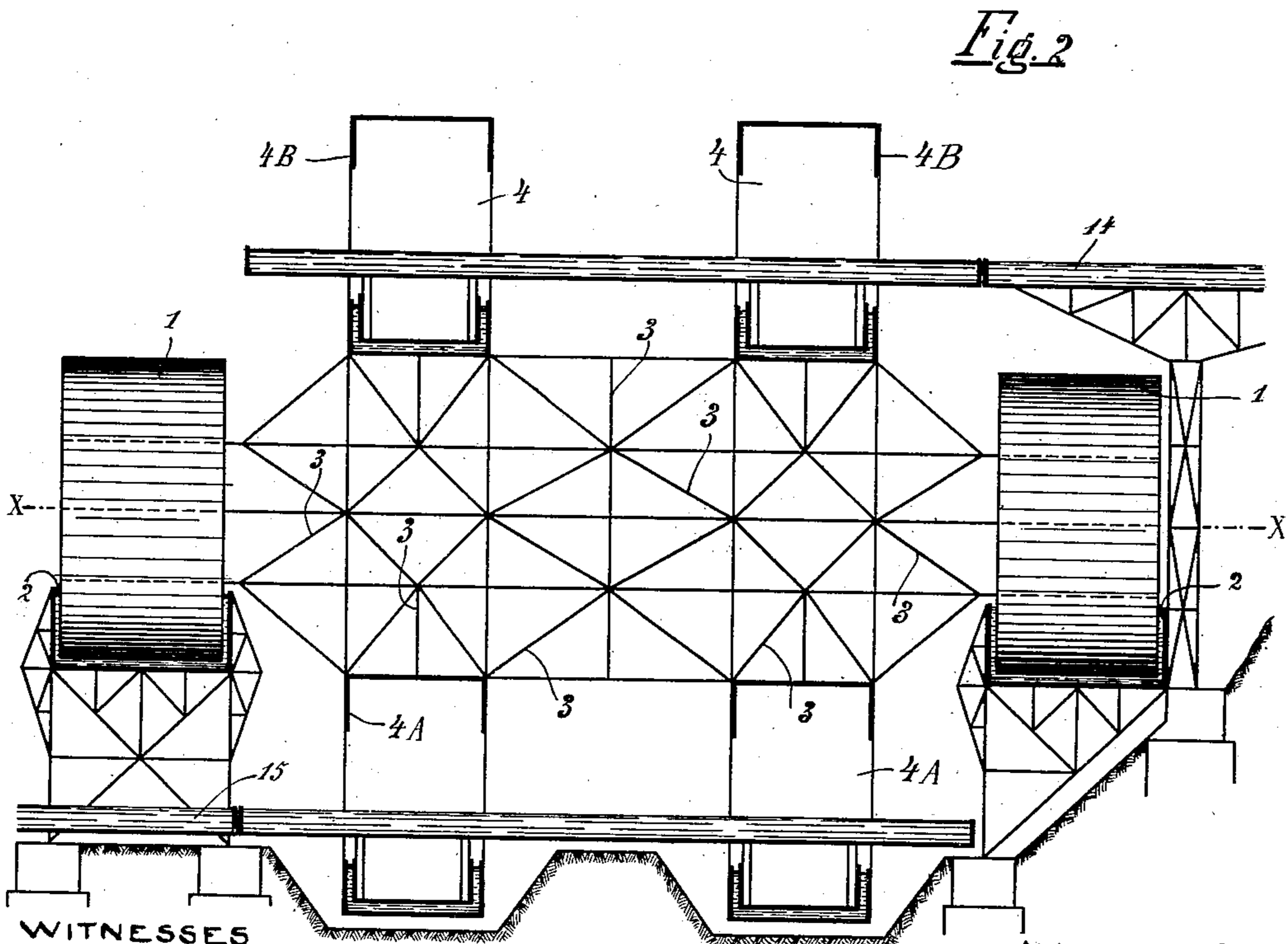


Fig. 1



WITNESSES

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3 SHEETS—SHEET 2.

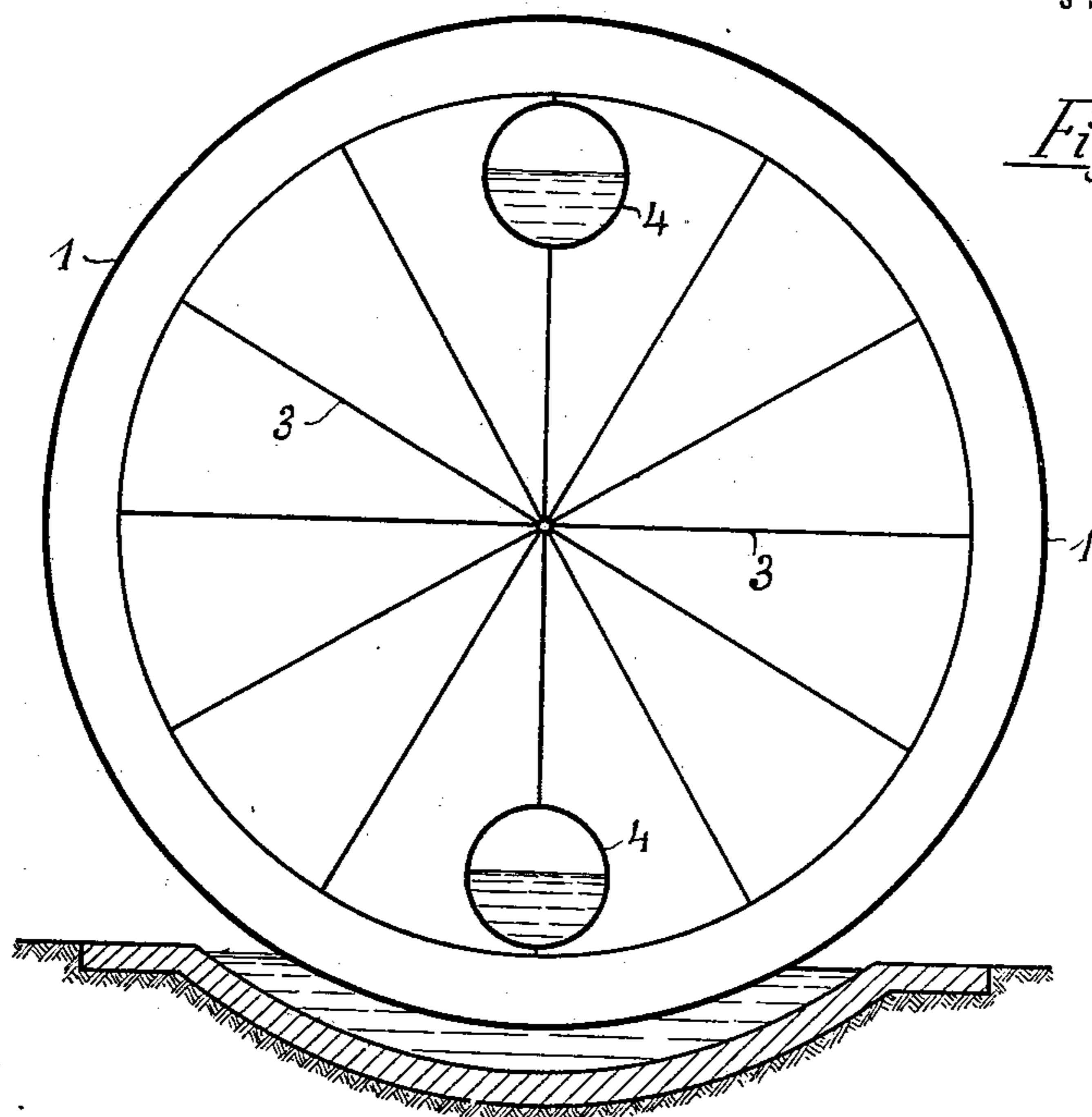


Fig. 3.

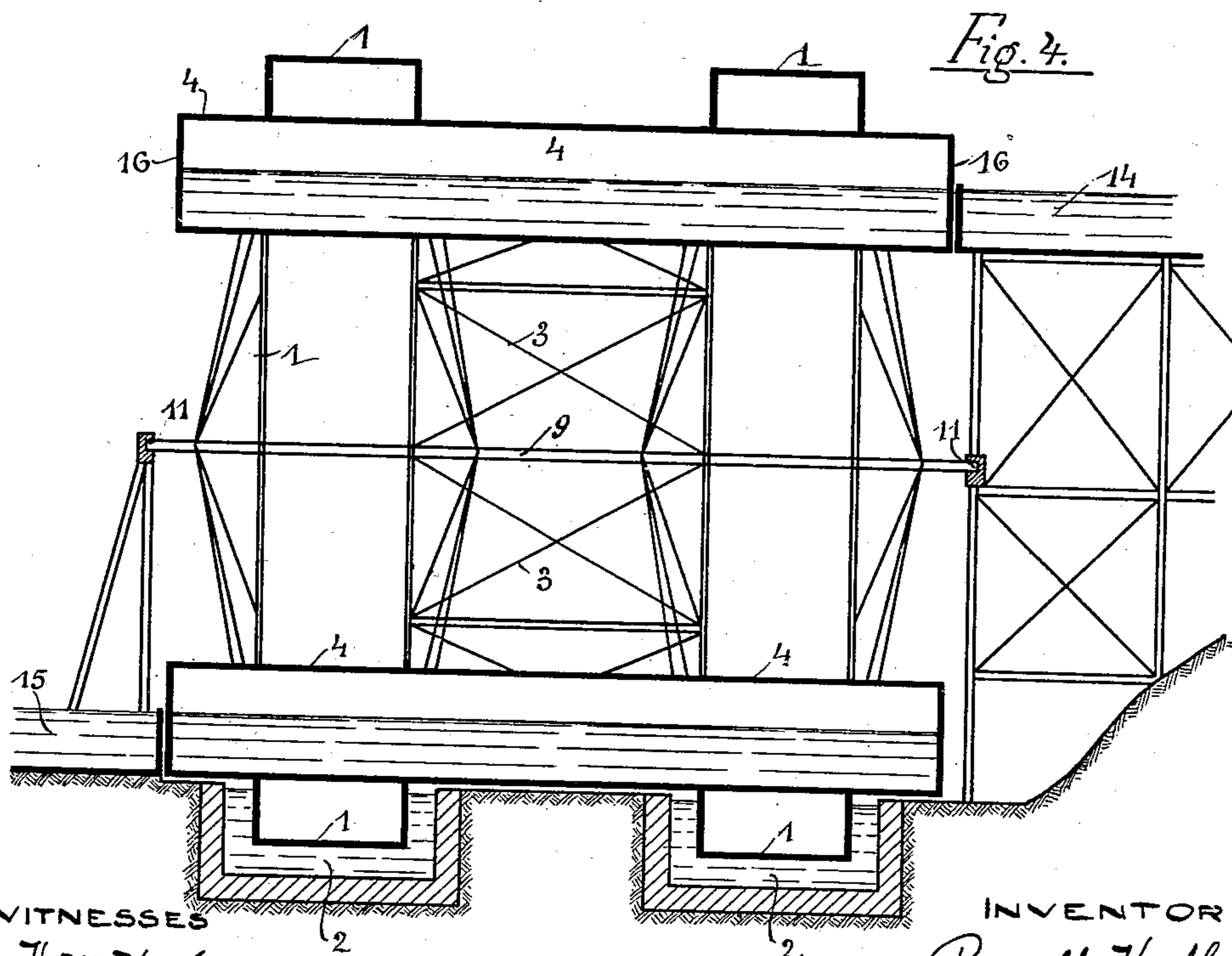


Fig. 4.

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3 SHEETS—SHEET 3.

Fig. 5.

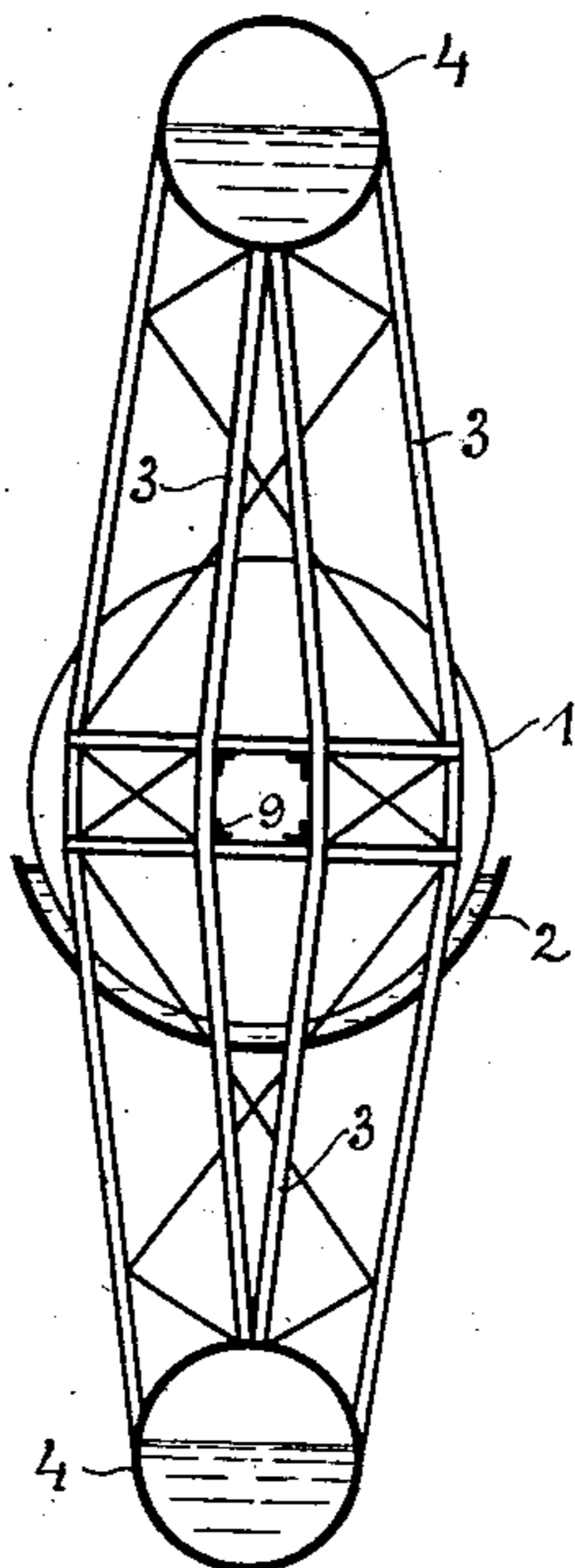
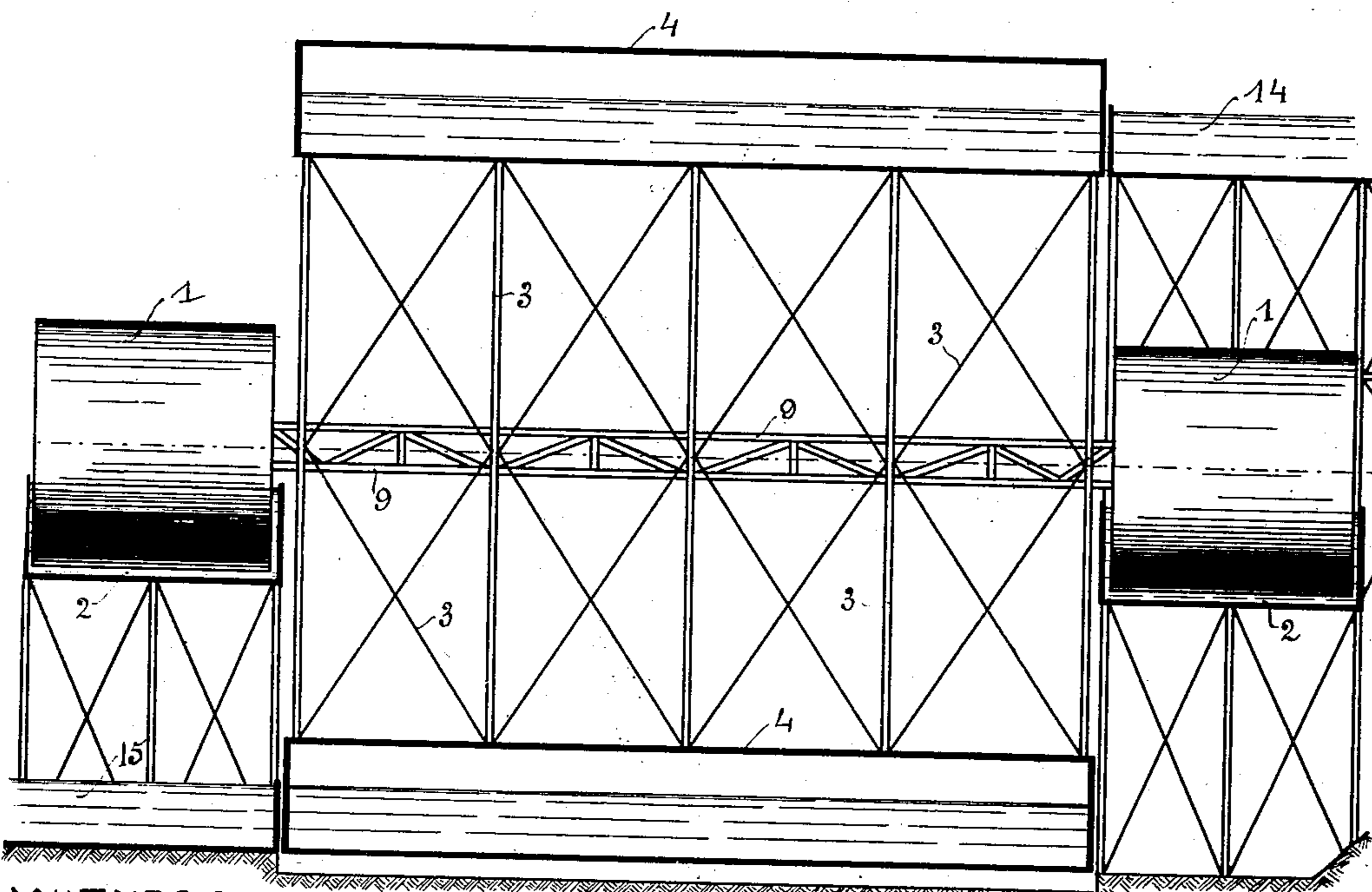


Fig. 6.



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UNITED STATES PATENT OFFICE.

RUDOLF KRELL, OF NUREMBERG, GERMANY, ASSIGNOR TO THE FIRM OF VEREINIGTE MASCHINENFABRIK AUGSBURG UND MASCHINENBAUGESSELLSCHAFT NÜRNBERG A. G., OF NUREMBERG, BAVARIA, GERMANY.

LIFTING APPARATUS FOR RAISING OR LOWERING CANAL-BOATS, &c.

SPECIFICATION forming part of Letters Patent No. 742,450, dated October 27, 1903.

Application filed March 16, 1903. Serial No. 148,057. (No model.)

To all whom it may concern:

Be it known that I, RUDOLF KRELL, residing in Nuremberg, in the Empire of Germany, (whose full postal address is Nuremberg aforesaid,) have invented Improvements in Lifting Apparatus Specially Adapted for Raising or Lowering Canal-Boats and the Like, of which the following is a specification.

This invention has for its object certain modifications of the apparatus for raising and lowering boats and other floating loads described in Patent No. 710,635 of October 7, 1902. In the form of construction of this lifting apparatus described in the said patent very large dimensions were necessary for the revoluble iron parts and also for the fixed masonry parts belonging thereto, involving both considerable cost in construction and expenditure of power when working.

Now the present invention has for its object, without affecting the effectiveness of the apparatus, to reduce its cost of construction and also to cheapen its working to a considerable extent. For this object certain modifications have been introduced in the original construction of the apparatus, and these will now be described.

The dimensions of the lifting mechanism were necessitated by the annular vessels, which had for their object to maintain floating the entire movable part of the apparatus, together with the load carried by it. They were so arranged as to inclose the rolling drums, in consequence of which the diameter of these annular vessels or floats considerably exceeded the lifting height.

One feature of the present invention consists in the large annular vessels or floats inclosing the rolling drums being replaced by annular vessels arranged at the ends, the diameter of which is independent of the height of lift, and therefore may be made considerably less.

In the present invention the carrying-cradles of the Umlauf construction are dispensed with and cylindrical tanks are used instead, said tanks being adapted in length, breadth, and height to receive the canal-boats, said tanks being closed at both ends with sluice-

gates extending over the entire cross-sectional area of said tanks.

I disclose herein three different ways of carrying out my invention.

The first form of construction of this mechanism for lifting boats and the like in which the annular vessels are arranged transversely is shown in Figures 1 and 2 of the accompanying drawings, Fig. 1 being an end view, and Fig. 2 a side view, thereof. Fig. 3 is an end view, partly in section, of a second form of my invention; and Fig. 4 is a side view with parts in section. Figs. 5 and 6 are views similar to Figs. 3 and 4 of another form of my invention.

The rolling drums 4, in which (according to Patent No. 710,635 of October 7, 1902) the pontoons containing the water-chamber float, are so connected with one another by means of a fixed series of arms 3 that they stand opposite one another in pairs on an axis $x x$. By the arrangement of the drums in pairs the possibility is afforded of counterbalancing the load of one, 4^A , and its opposite drum, 4^B , in such a way that the amount of power required for turning them round the axis $x x$ —that is to say, for lifting 4^A and lowering 4^B , Fig. 1—is merely the amount of the friction arising at the points of support of the shaft or axis $x x$.

Annular vessels or receptacles 1 are combined with the above-mentioned system on arms at the ends of the central axis, on which the rolling drums are mounted, which vessels 1 float in troughs 2. The drums 4 thus form the points of support or trunnions for the axis $x x$, the respective bearings of which must be considered to be in the troughs 2, filled with water.

A second form of construction of this improved lifting apparatus in which the rolling drums are modified is shown in end elevation and side elevation in Figs. 3 and 4. Two annular vessels 1 of the kind shown in before-mentioned patent float in troughs 2 and are firmly connected together by a lattice-work 3 and with a central shaft 9, carried in bearings 11 and provided with two elongated tanks or drums 4, bridging over the space be-

tween the two annular vessels 1. These drums are filled with water to the same depth as the canal itself and are of sufficient length, width, and height to receive the greatest loads they are likely to be called upon to carry. On the ends of these tanks or drums 4 sluice-gates 16 are arranged, which extend over the entire ends of the drums. The two canal-sections 14 and 15 are shut off by sluices, as before, and, as required, may be brought into communication with the ends of the elongated tanks or drums placed at their ends, so that boats may be passed in and out.

A third form of construction is shown in Figs. 5 and 6 of the accompanying drawings. In this case tanks or drums 4, as in the second form of construction, having an elongated form are firmly connected by a lattice mechanism 3 with a shaft 9 and with two annular vessels 1, arranged at the ends. The latter float in troughs 2 and serve as trunnions for the whole apparatus. The arrangement of sluice-gates at the ends of both the tanks or drums and the sections of canal 14 and 15 is the same as in the first-described arrangement.

As may be seen from the drawings, without further explanation in all the forms of construction shown the dimensions both of the annular vessels and the tanks or drums and also more particularly of the revoluble girder constructions, serving for connecting the latter with one another and with the annular

vessels, and also the fixed masonry parts are considerably diminished, and thereby considerable saving is effected in the cost of construction and working. Similarly a considerably greater stability and security of working are obtained.

I declare that what I claim is—

1. In an apparatus for raising and lowering canal-boats and the like, the combination with a framework, water-troughs, and means for supporting said framework floating in said troughs, of drums mounted opposite one another in said framework and adapted to receive the boats or the like directly, and sluice-gates completely closing the ends of said rolling drums, whereby the drums may be brought into communication with the canal-troughs or may be closed completely at the ends, substantially as described.

2. In an apparatus for raising and lowering canal-boats and the like, the combination of a framework, means mounted in said framework for floating and supporting the boats or the like, two water-troughs, and two floats mounted on the ends of said framework, and floating in said troughs, substantially as and for the object set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

RUDOLF KRELL.

Witnesses:

FR. MARTIN OFFENBACHER,
OSCAR BOCK.