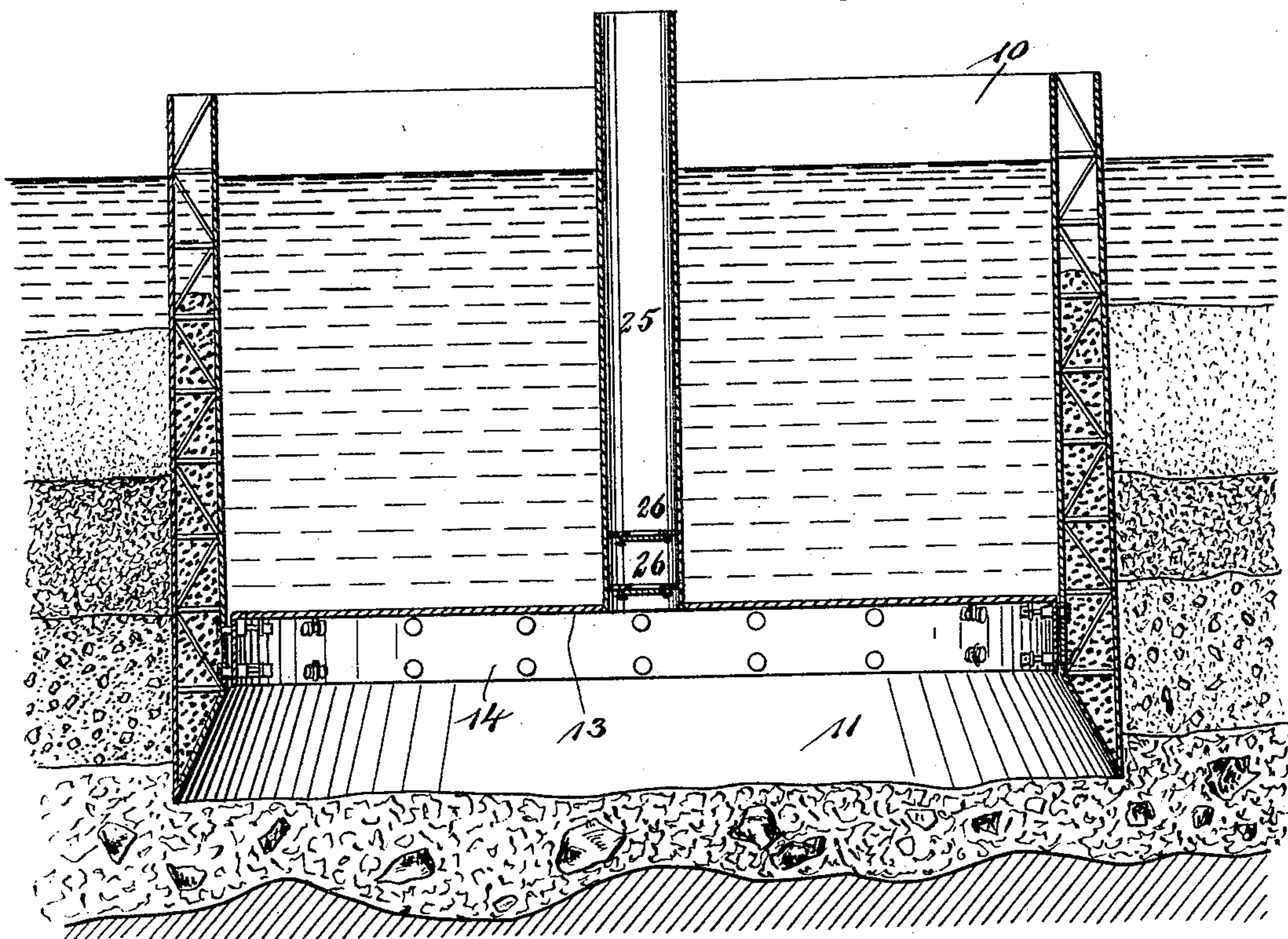


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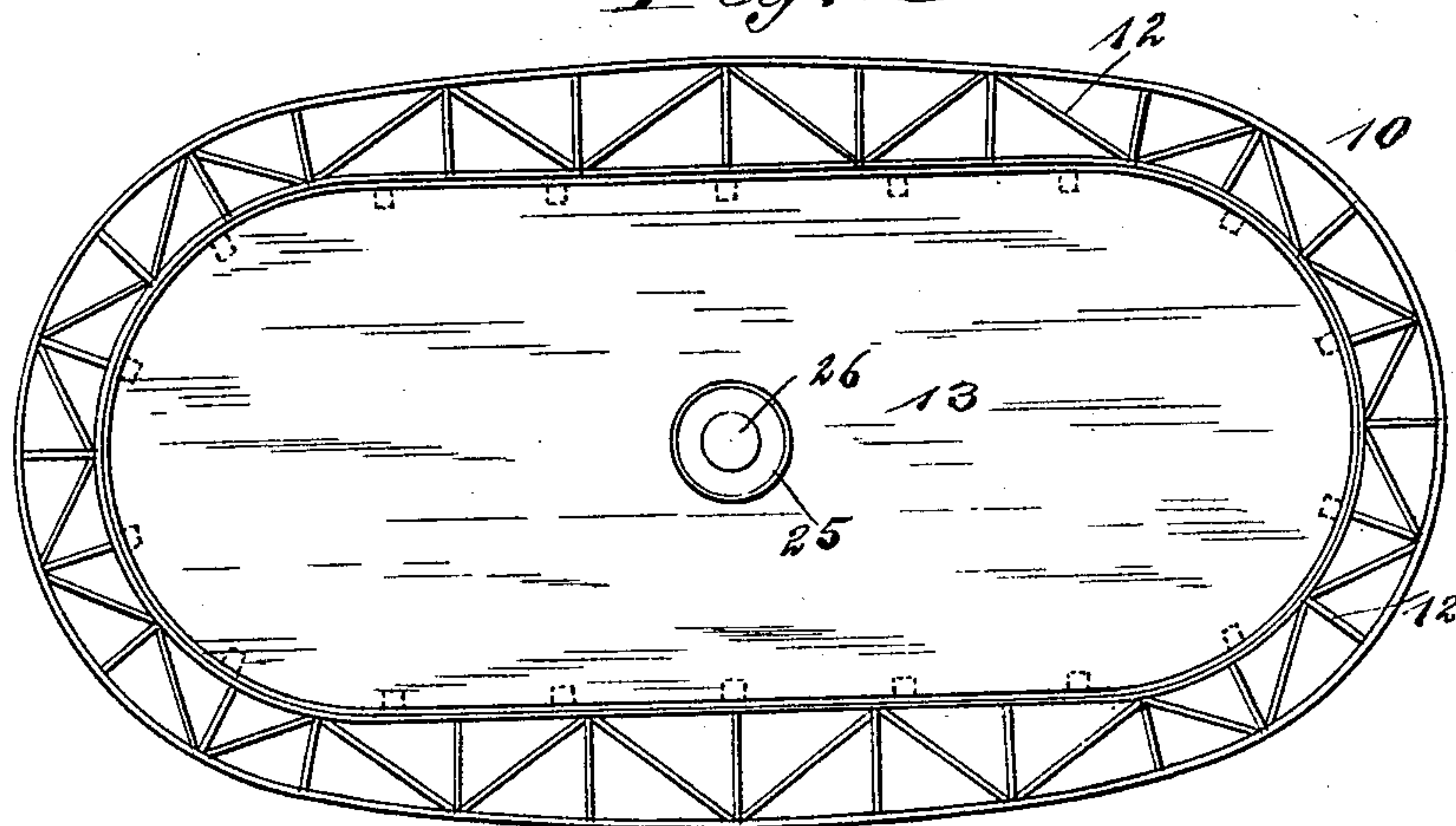
No. 480,127.

Patented Aug. 2, 1892.

*Fig. 1*



*Fig. 2*



WITNESSES :

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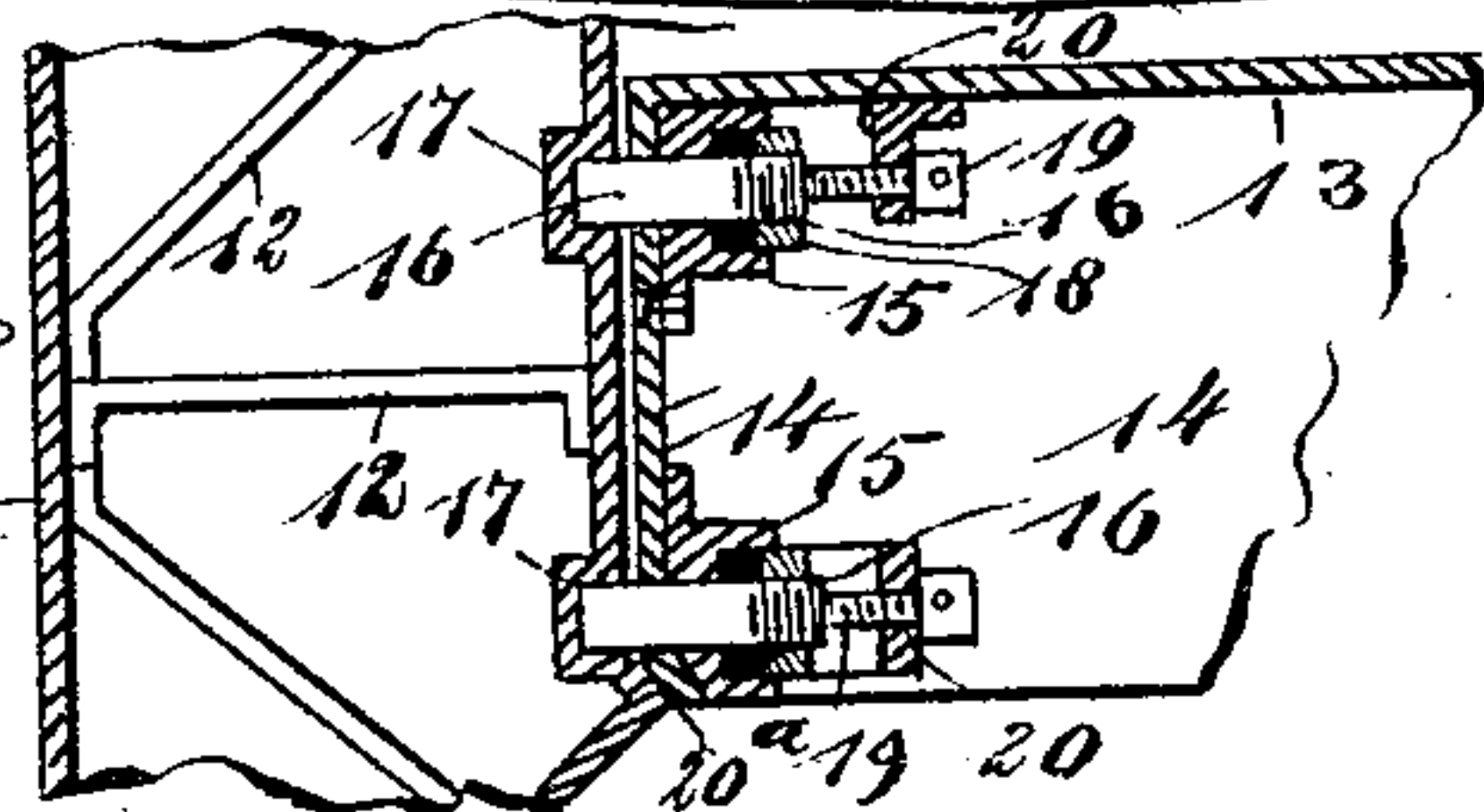


Fig. 5

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(No Model.)

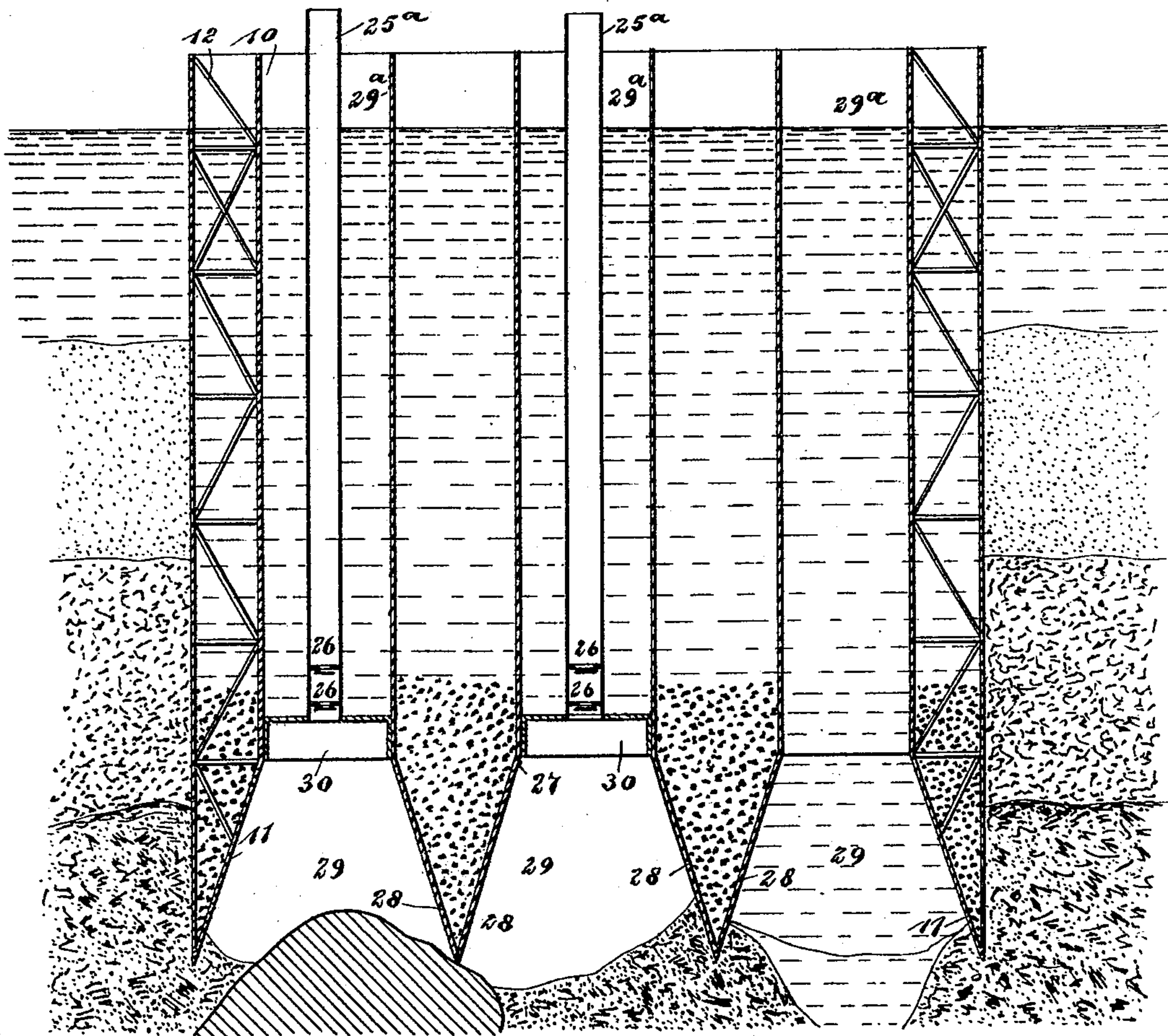
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J. F. O'ROURKE.  
CAISSON.

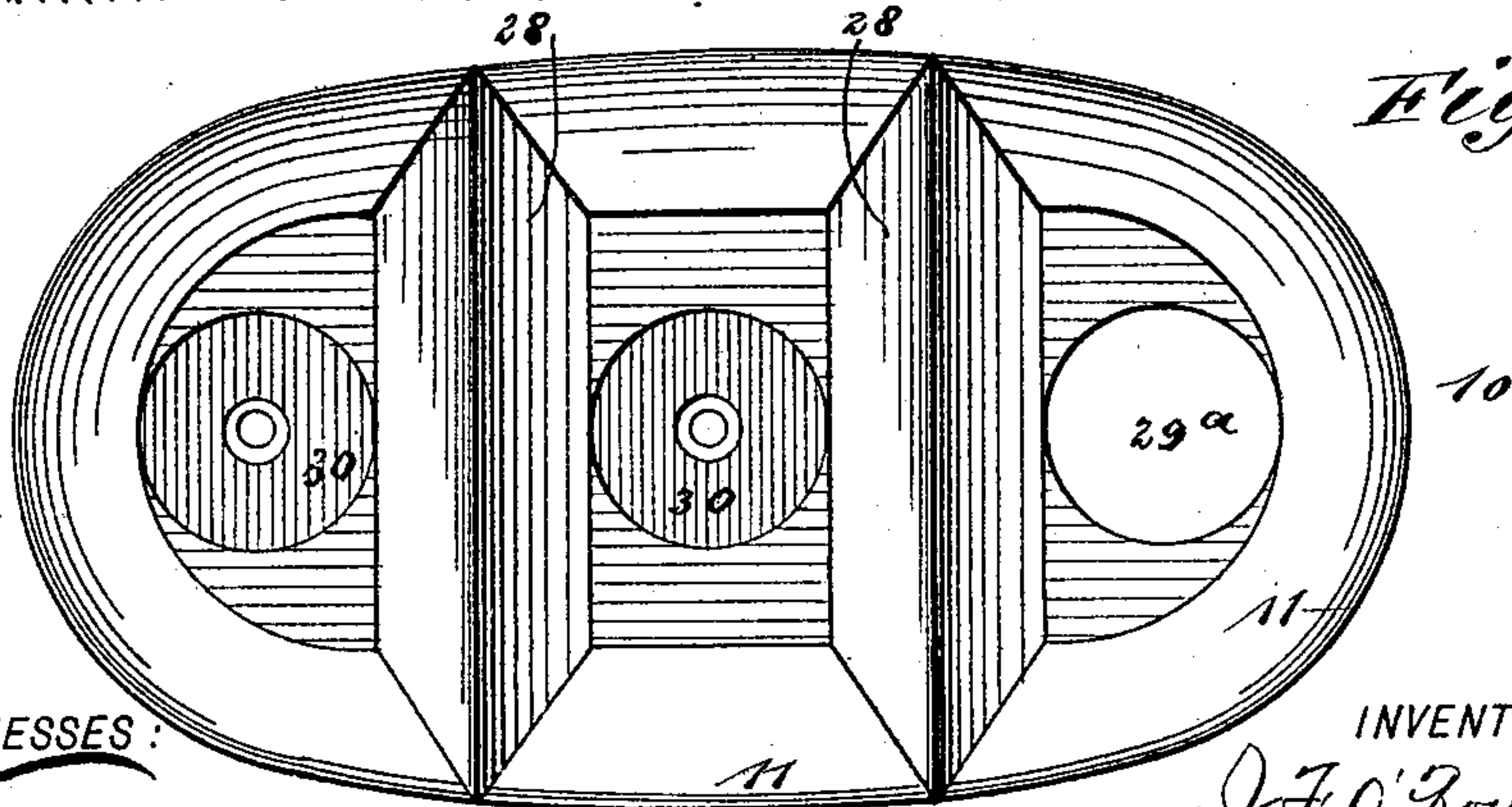
No. 480,127.

Patented Aug. 2, 1892.

*Fig. 4*



*Fig. 5*



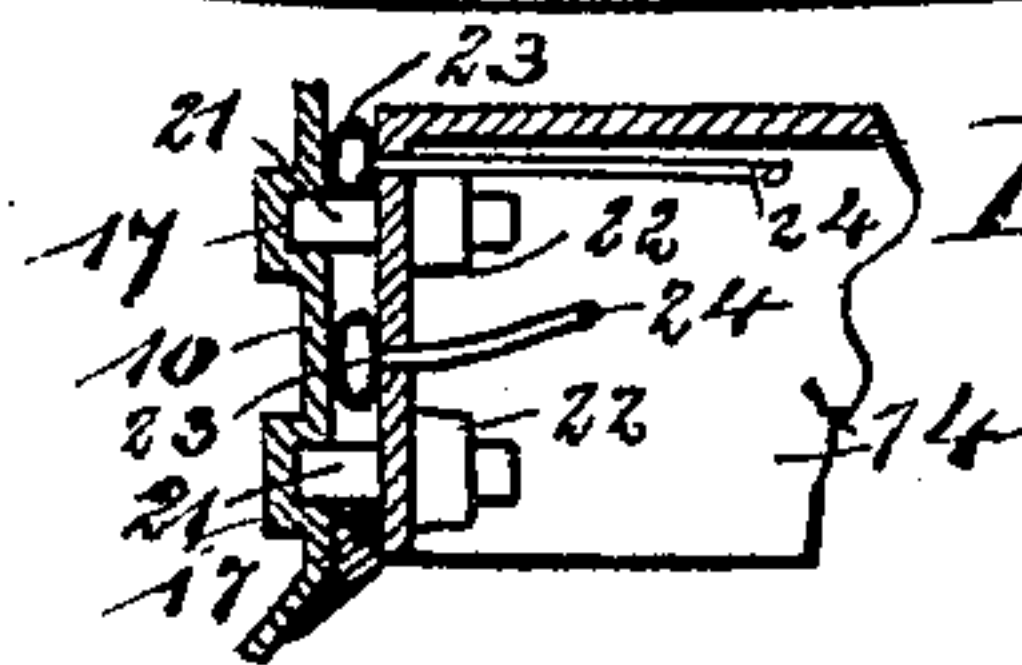
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*Fig. 6*



# UNITED STATES PATENT OFFICE.

JOHN F. O'ROURKE, OF NEW YORK, N. Y.

## CAISSON.

SPECIFICATION forming part of Letters Patent No. 480,127, dated August 2, 1892.

Application filed April 28, 1892. Serial No. 431,055. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN F. O'ROURKE, of New York city, in the county and State of New York, have invented a new and Improved  
5 Caisson, of which the following is a full, clear, and exact description.

My invention relates to improvements in caissons, such as are used in dredging and preparing under-water foundations; and the  
10 object of my invention is to produce a caisson that has the advantages, economy, and rapidity of work of the open caisson during the sinking of the same, while there are no difficulties that prevent the excavation from  
15 being uniformly performed by dredging, and which, when that method is interfered with by bowlders or the solid rock rising abruptly under one part of the bottom, or from any other cause, may be easily converted by the  
20 introduction of a bell or its equivalent into a pneumatic caisson having suitable means of ingress and egress for men and materials and provided with a suitable dredging-passage and chamber, so that the caisson will have  
25 all the advantages of both the open and pneumatic caisson and may be easily converted from one to the other.

To this end my invention consists in a convertible caisson the construction of which will  
30 be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

35 Figure 1 is a central vertical section of a caisson embodying my invention, showing it provided with a single dredging-chamber and with the bell or roof secured in position in the open caisson. Fig. 2 is a plan view of  
40 the caisson shown in Fig. 1. Fig. 3 is an enlarged detail sectional view of one method of packing the joint between the roof or bell and the sides of the open caisson. Fig. 4 is a central vertical section of a caisson em-  
45 bodying my invention and having several dredging-chambers therein, the view showing two chambers arranged to operate as a pneumatic caisson and one chamber arranged for use as an open caisson. Fig. 5 is an inverted  
50 plan of the caisson shown in Fig. 4, and Fig. 6 is an enlarged detail sectional view of the

preferred form of packing which may be used with either form of caisson.

The caisson 10 is the ordinary open caisson, having an inclined lower edge 11, which  
55 enables it to be driven down through the mud, silt, sand, and gravel beneath the water, and this caisson may be made in any suitable way and may be built up in sections in the ordinary manner, so as to make  
60 it of the necessary height. As shown in the drawings, it is provided with double walls braced by the cross-braces 12; but the details of construction I do not claim as my in-  
65 vention.

The caisson is adapted to be used in the ordinary way as an open caisson, and when it is to be converted into a pneumatic caisson a roof or bell 13 is used, which is adapted to be pushed down into the open caisson and  
70 which has a depending flange 14, adapted to extend parallel with the inner wall of the open caisson. The joint between the roof or bell and the open caisson may be packed in any convenient way, and in Figs. 3 and 6 I  
75 have shown means of properly packing the joint.

As shown in Fig. 3, the flange 14 is provided at intervals and near the top and bottom with supporting-cleats 15, through which  
80 extend bolts 16, the outer ends of the bolts being adapted to enter sockets 17 in the wall of the caisson 10, and the inner ends of the bolts are threaded and provided with adjusting-nuts 18, a suitable packing being inserted  
85 between the nuts and the cleats 15. The inner ends of the bolts connect with screws 19, which are held to turn in lugs 20, and by means of the screws the bolts 16 may be quickly loosened when desired. The pack-  
90 ing 20<sup>a</sup> is held at the lower edge of the flange 14 and between it and the adjacent wall of the open caisson 10, this wall being preferably inclined inward at this point, as shown in Fig. 3. The preferred form of packing is  
95 shown, however, in Fig. 6. Here the bolts 21 extend through the flange 14 and enter the sockets 17, the bolts being provided with suitable nuts 22, and between the flange and the adjacent wall of the caisson 10 are en-  
100 expansible tubes 23, which are connected with pipes 24, adapted to connect with the mech-



anism for supplying air to the dredging-chamber, and by this means the tubes 23 may be inflated so as to effect a perfectly tight joint.

5 In Figs. 4 and 5 I have shown an open caisson provided with a number of chambers, these being formed by the partitions 28, which terminate at their lower ends in edges adapted to sink readily through the material be-  
10 neath the water, and the chambers 29, formed between the partitions of the caisson, have dredging-passages 29<sup>a</sup>, opening upward through the caisson. These passages may be closed at their lower ends by bells or roofs 30,  
15 which are similar to the bell or roof described above, except that they are smaller, and opening upward from these bells are shafts 25<sup>a</sup>, which serve as working-shafts in the manner already described, and these are provided  
20 with suitable locks 26 at their lower ends.

As shown in Fig. 4, two of the chambers 29 are arranged to be used as pneumatic chambers, the bells 30 being fastened in place above them, and the other chamber 29 and its pas-  
25 sage 29<sup>a</sup> serve the purpose of an ordinary open caisson, and it will be seen that the arrangement described provides for using one or more chambers as open caissons and one or more as pneumatic caissons, as circumstances re-  
30 quire.

The apparatus is used in the following way: The open caisson 10 is sunk downward through the mud, silt, sand, and gravel by dredging from within and beneath it, and used as long  
35 as it conveniently can be as an open caisson, and when the more solid bottom is reached, or the side edges of the caisson strike an obstruction, the bell or bells, as the case may be, and the shafts are lowered downward into the  
40 caisson and secured firmly in place in the manner described. Compressed air is then forced downward into the dredging-chamber or chambers, thus forcing out the water and

leaving the chamber in condition for the men to work within it, and the men and materials 45 may be lowered in the ordinary way through the passage 25. A suitable bottom may be provided for concrete, after which the men are withdrawn, the compressed air removed, the bell raised from the open caisson, and the 50 concrete lowered through the water and filled up within the open caisson to a point where it is desirable to pump out the water and complete the concreting in the air.

The upper part of the caisson may be made 55 in detachable sections like the sides of an ordinary floating caisson for convenience in removal after the masonry is built.

I do not claim the construction of either the open caisson or the bell as a part of my inven- 60 tion, as caissons and bells of this kind have long been used, but the combination described and the convertible feature illustrated and set forth above is believed to be new.

Having thus described my invention, I 65 claim as new and desire to secure by Letters Patent—

1. The combination, with the open caisson, of a detachable bell held to fit within the open caisson and provided with a suitable shaft, 70 substantially as described.

2. A convertible caisson comprising an open main caisson having an inclined lower edge and a removable bell or roof held to fit within the open caisson and provided with a suitable 75 shaft, substantially as described.

3. The combination of the main caisson, a detachable bell held to fit therein, and the inflatable packing-tubes held between the walls of the bell and caisson, substantially as 80 described.

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Witnesses:

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