

No. 676,993.

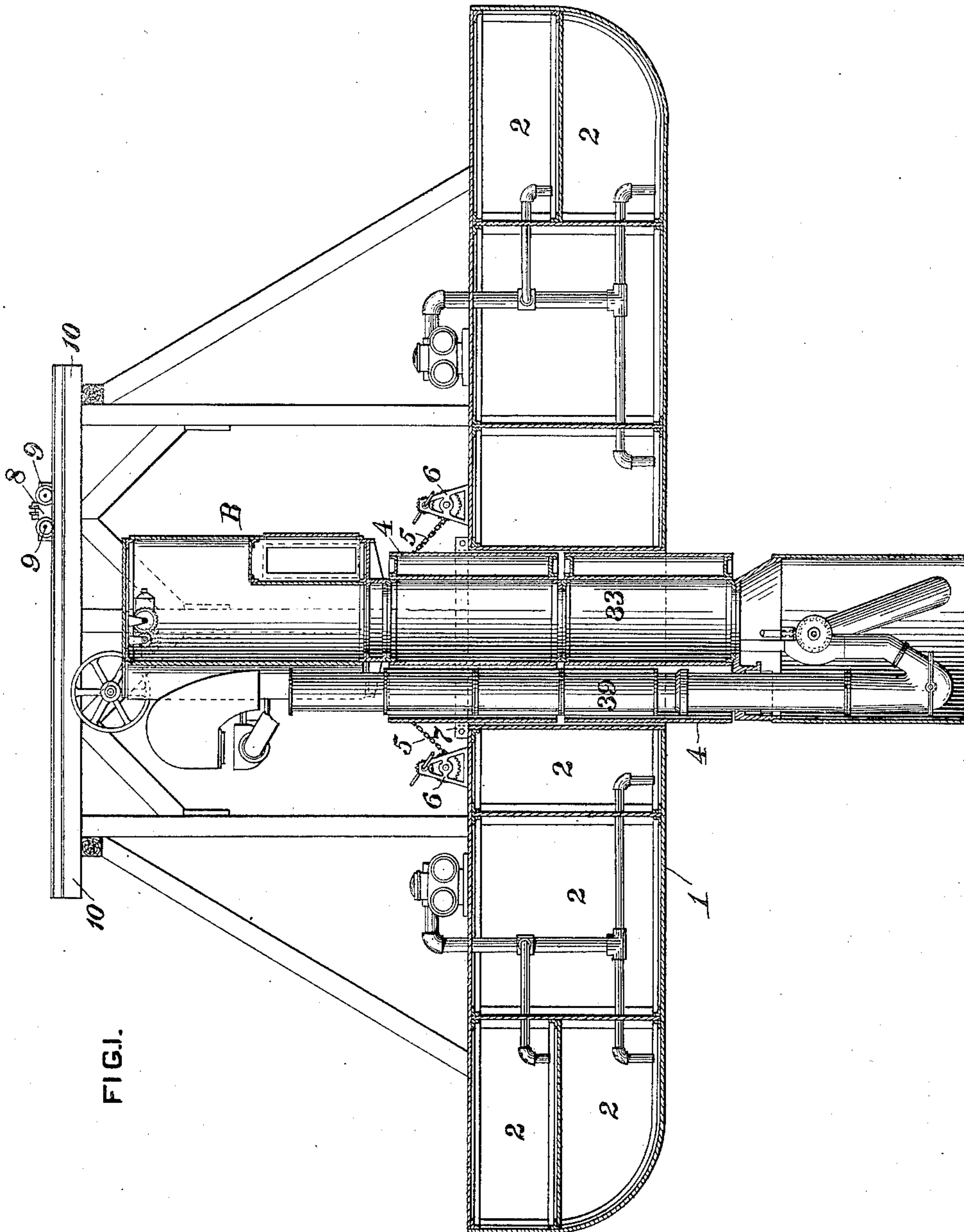
Patented June 25, 1901.

W. H. McFADDEN.
CAISSON.

(Application filed Oct. 26, 1900.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

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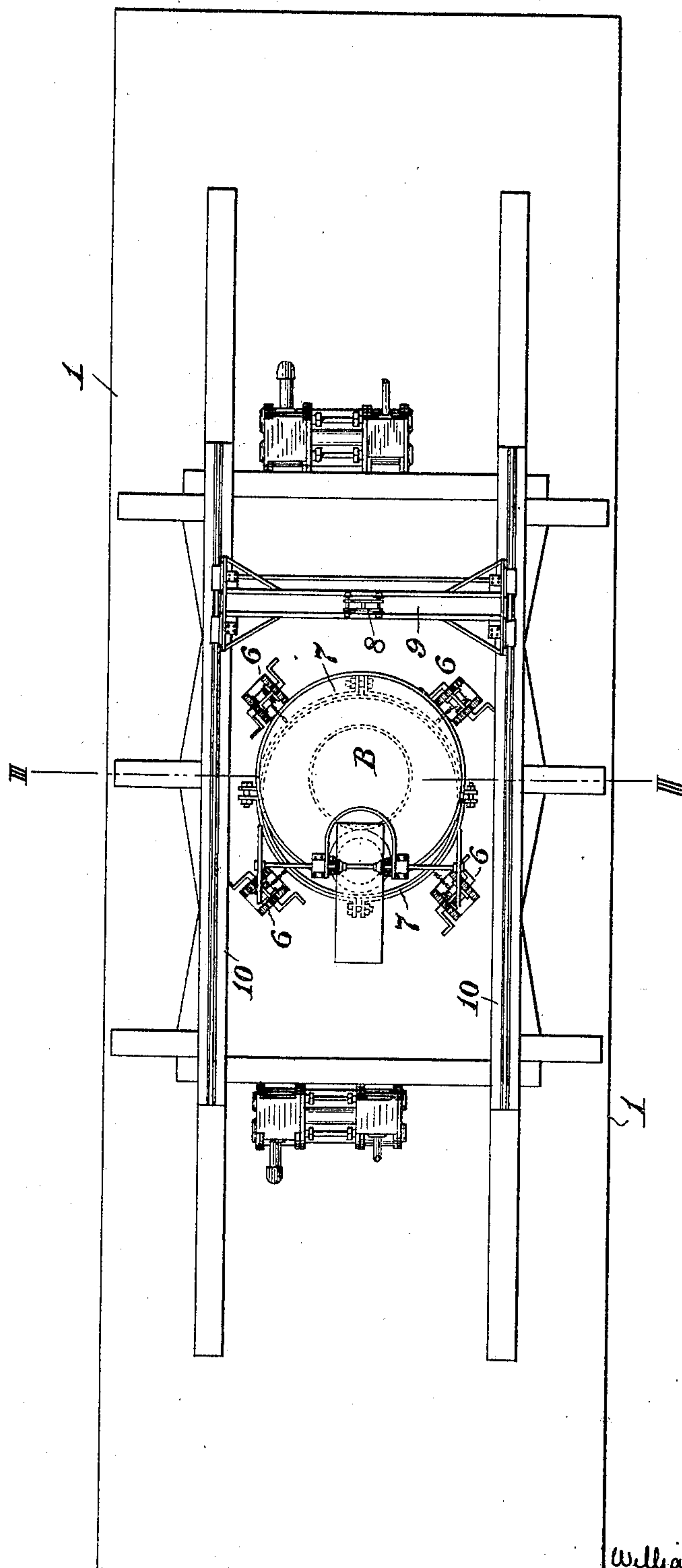
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3 Sheets—Sheet 2.



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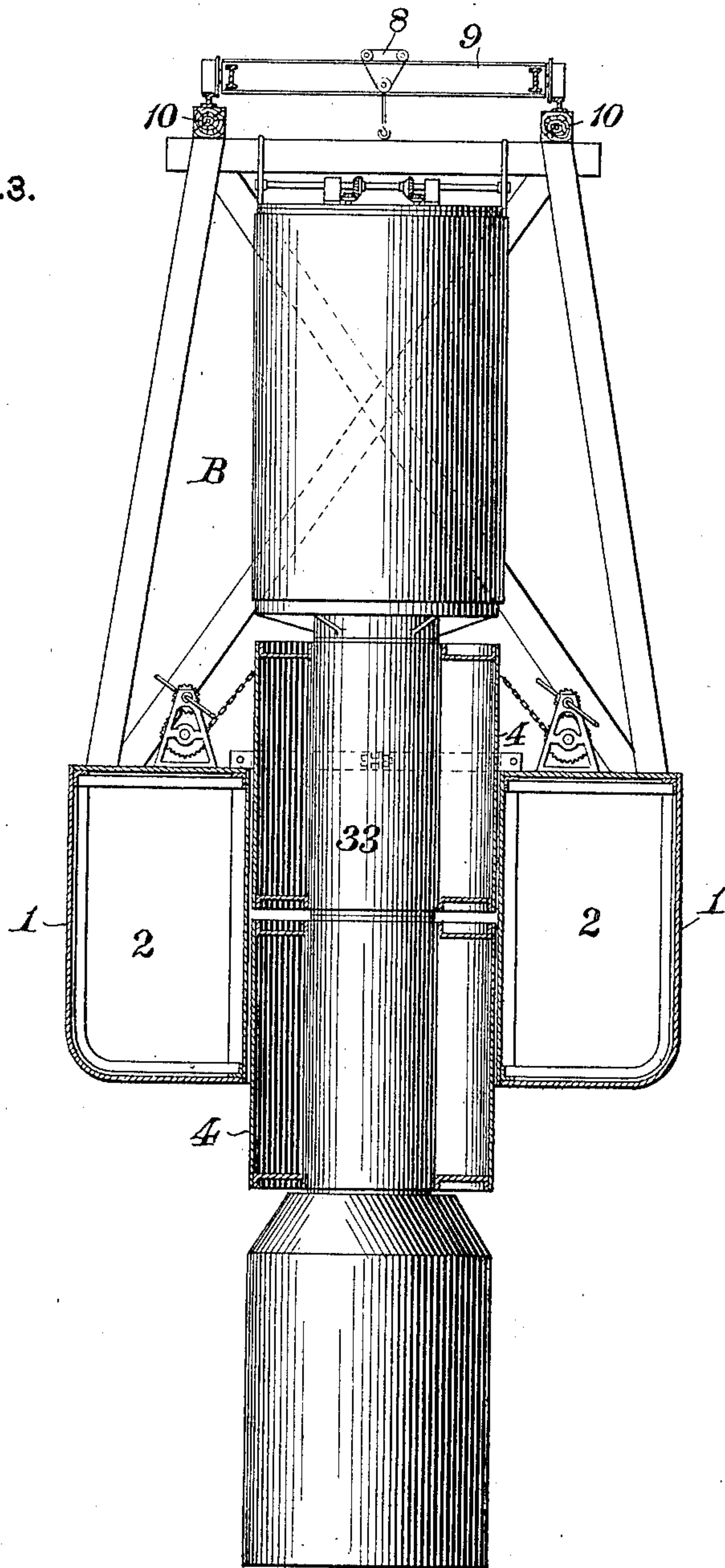
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3 Sheets—Sheet 3.

FIG. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM H. McFADDEN, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO
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CAISSON.

SPECIFICATION forming part of Letters Patent No. 676,993, dated June 25, 1901.

Application filed October 26, 1900. Serial No. 34,479. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. McFADDEN, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Caissons, of which improvements the following is a specification.

The invention described herein relates to certain improvements in caissons, and has for its object the employment of a pontoon for sinking and raising the caisson and holding the same steadily in position.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional elevation of my improvement. Fig. 2 is a top plan view of the same; and Fig. 3 is a sectional elevation on a plane indicated by the line III III, Fig. 2.

While I have shown my improvement in connection with the construction of caisson forming the subject-matter of Letters Patent No. 656,850, granted to me August 28, 1900, the improvements hereinafter described can be readily applied to other forms or constructions of caissons.

In the practice of my invention I employ a pontoon or float 1, provided with a series of compartments 2 for the reception of water when it is desired to sink the pontoon or float. The water can be removed from these compartments by means of a pump 3, or an air-compressor may be substituted for the pump and the water discharged by forcing air into the compartments, which in such case would be made air-tight. An opening or well is formed through the pontoon or float, and the caisson is arranged in such opening or well. When the caisson is of uniform dimensions as regards the portion inclosed by the well, the latter is made a little larger than the caisson, permitting of the free up-and-down movement of the caisson through the opening or well while operating as a guide to hold the caisson in a vertical position.

In applying the improvement to the form of caisson described in the Letters Patent referred to a shell or cylinder 4 is secured around the tunnel 33 and discharge-conduit

39, said shell having an external diameter equal or approximately equal to the external diameter of the working chamber, thereby rendering the portion of the caisson which will move through the well symmetrical.

The caisson is connected to the float or pontoon by means of chains 5, having one end attached to the caisson and the opposite ends to winches 6, which are secured on the pontoon or float. By means of the chains and winches the caisson can be forced down into the sand, mud, or other material; but it is preferred, in sinking the caisson, to force water out of the pontoon and as the latter rises to hold the caisson from upward movement if the buoyancy of the contained air is greater than the weight of the caisson by operating the winches. After the pontoon has risen a sufficient distance water is forced or admitted into the compartments, thereby sinking the pontoon, which will draw the caisson with it.

When it is desired to raise the caisson, the pontoon is sunk by the admission or forcing of water into the compartments of the pontoon, the chains 5 being slackened off as the pontoon sinks. If the resistance to the upward movement of the caisson is excessive, requiring a force greater than the buoyancy of the caisson itself, a band 7 may be secured around the caisson in such position that lugs projecting from the band will rest on the pontoon. As shown in the drawings, the lugs may be formed by the outturned ends of the sections of the band. The water is now forced from the pontoon, which in rising will lift the caisson. In order to support the caisson if it be desired to change its position relative to the pontoon when the working chamber of the caisson is not resting on the ground, the upper end of the caisson is attached to the hoisting-chain carried by the trolley 8, which is mounted on the bridge member 9 of an overhead crane. The wheels at the ends of the bridge run on rails on beams 10, supported by suitable framework on the pontoon. When the weight of the caisson is not too great, the lifting-band 7 may be omitted and the caisson connected to the pontoon by the overhead crane alone. This overhead crane is also employed for lifting the air-chamber B when it

is desired to add sections to the tunnel 33 or remove them therefrom, as described in said patent.

I claim herein as my invention—

5 1. The combination of a pontoon or float, means for changing the buoyancy of the float, a caisson and connections from the pontoon to the caisson whereby the caisson may be lifted and forced down by the pontoon or float
10 by varying the buoyancy of the pontoon or float, substantially as set forth.

2. The combination of a pontoon or float provided with a well or opening therethrough, a caisson arranged in said well, adjustable
15 connections from the pontoon to the caisson whereby the caisson is caused to move down

with the pontoon, and means for changing the buoyancy of the pontoon, substantially as set forth.

3. The combination of a pontoon or float 20 provided with a well or opening therethrough, a caisson arranged in said well, a series of two or more winches on the pontoon or float, having their chains connected to the caisson, and means for changing the buoyancy of the 25 pontoon, substantially as set forth.

In testimony whereof I have hereunto set my hand.

WILLIAM H. McFADDEN.

Witnesses:

DARWIN S. WOLCOTT,
F. E. GAITHER.