

No. 850,643.

PATENTED APR. 16, 1907.

J. J. HARPAIN.

APPARATUS FOR TRANSPORTING AND LAUNCHING BOATS.

APPLICATION FILED APR. 23, 1906.

3 SHEETS—SHEET 1.

Fig. 1.

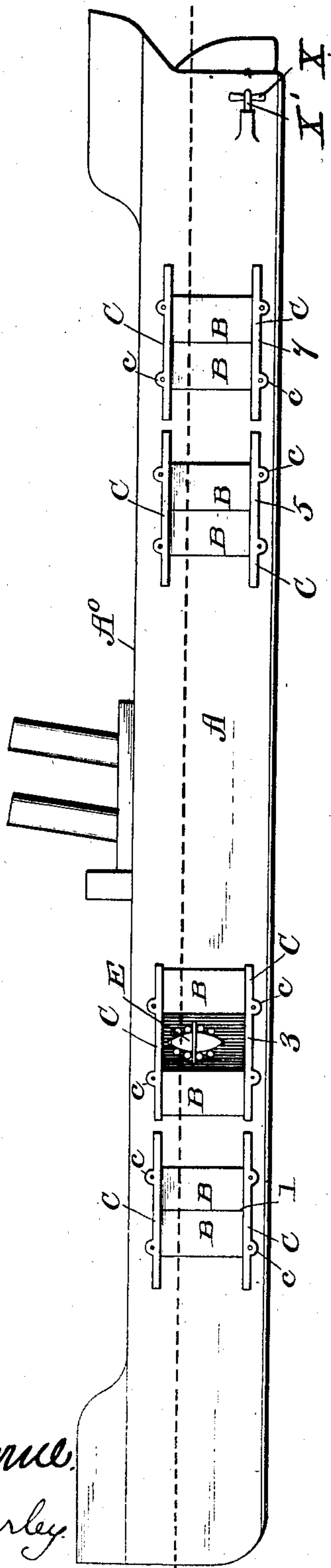
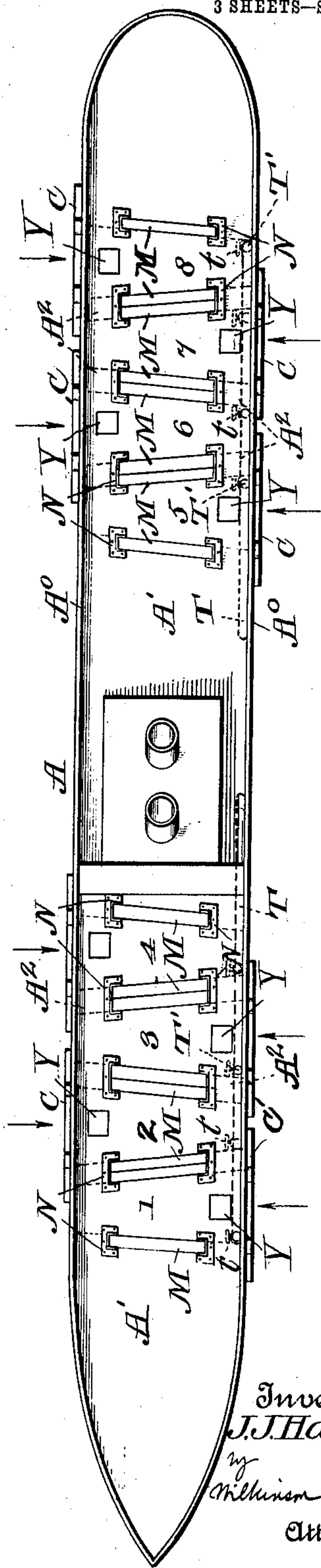


Fig. 2.



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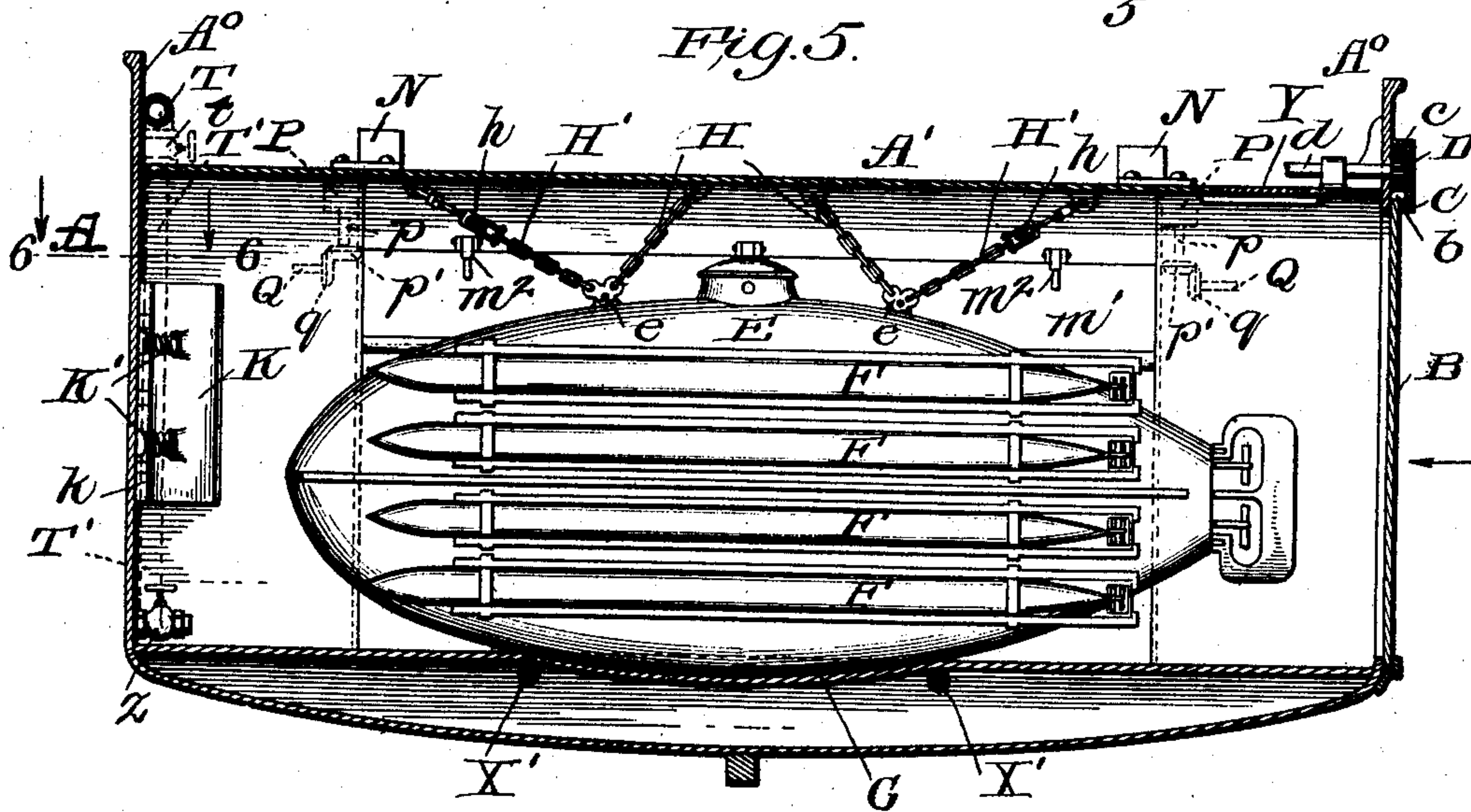
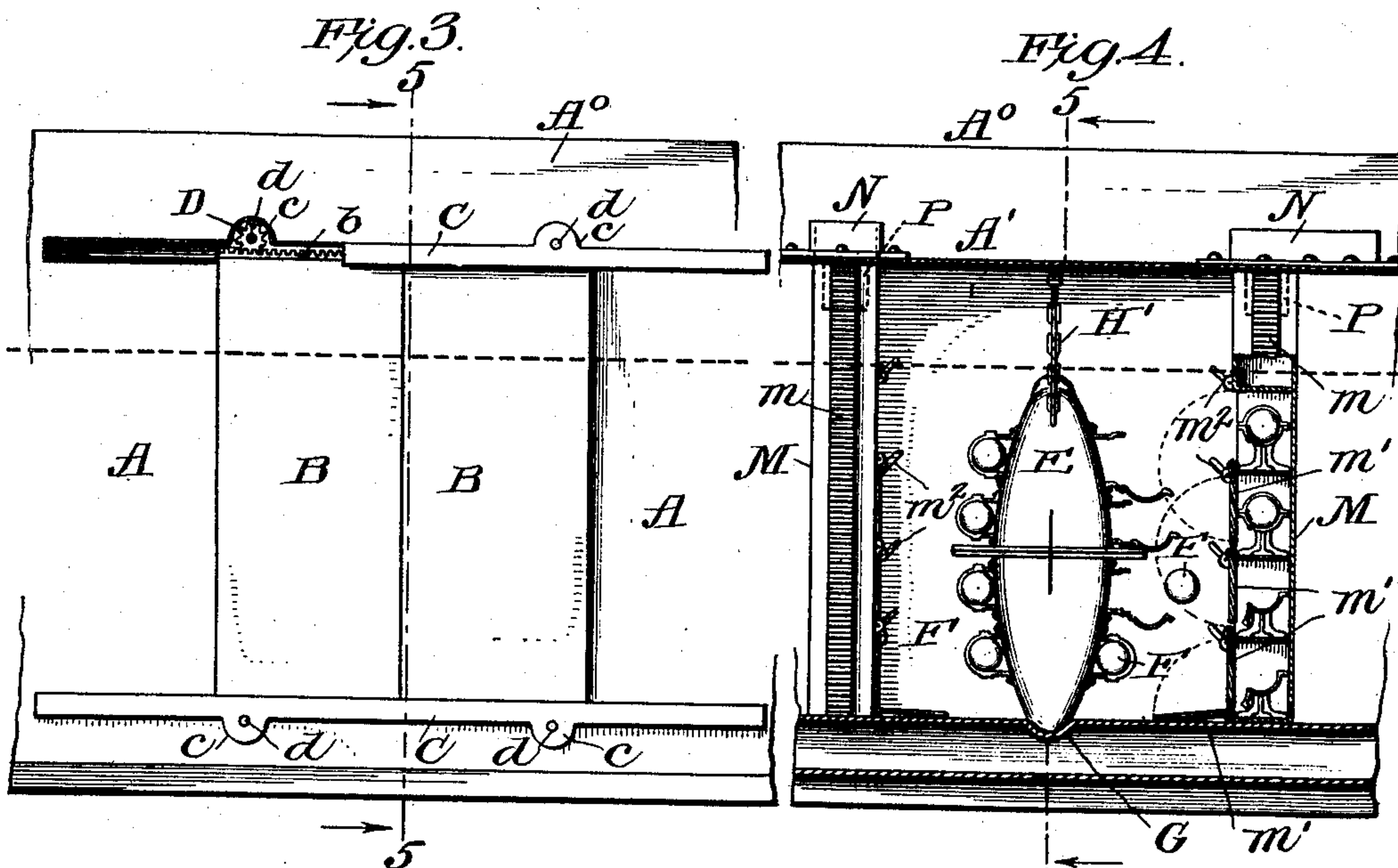
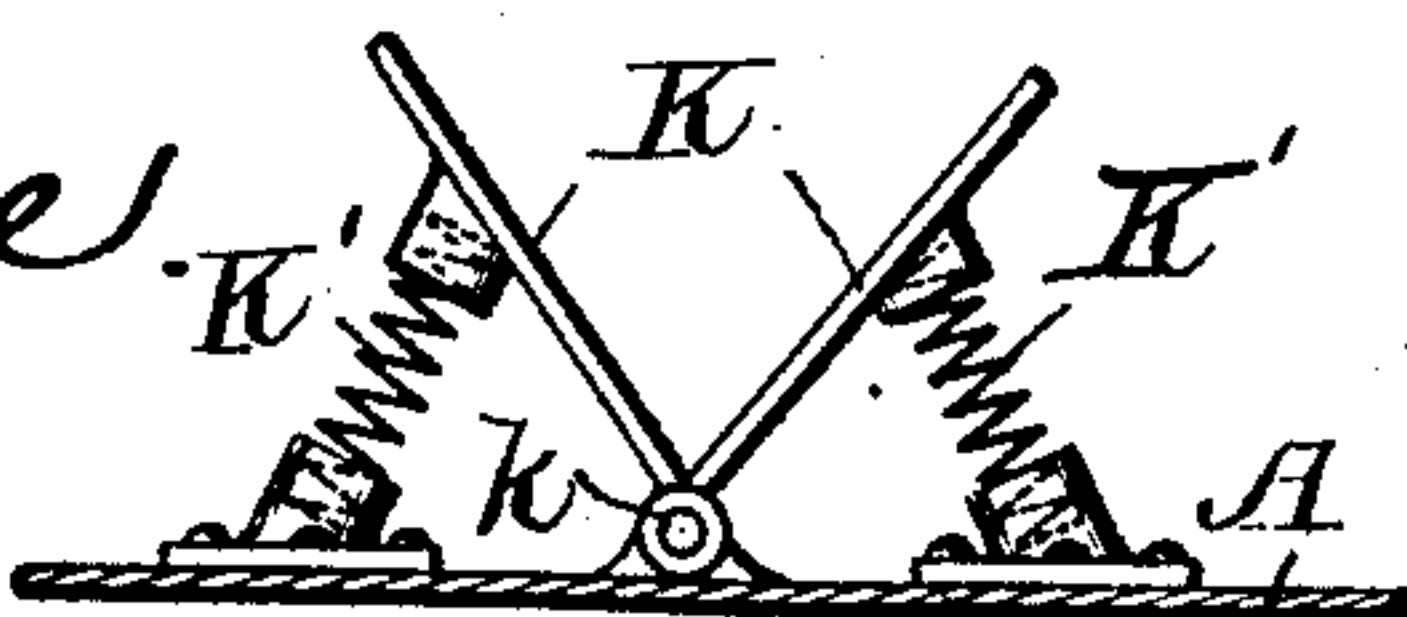


Fig. 6.

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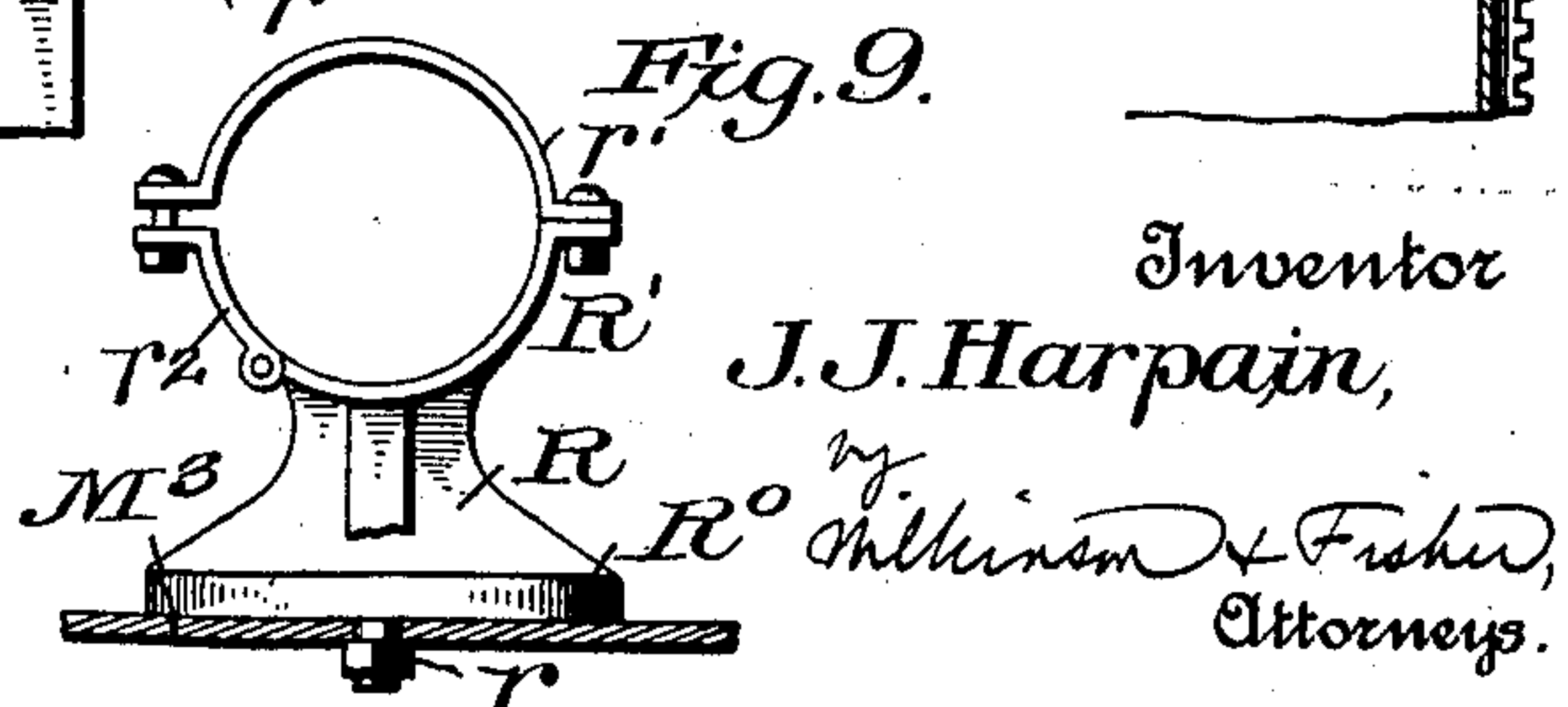
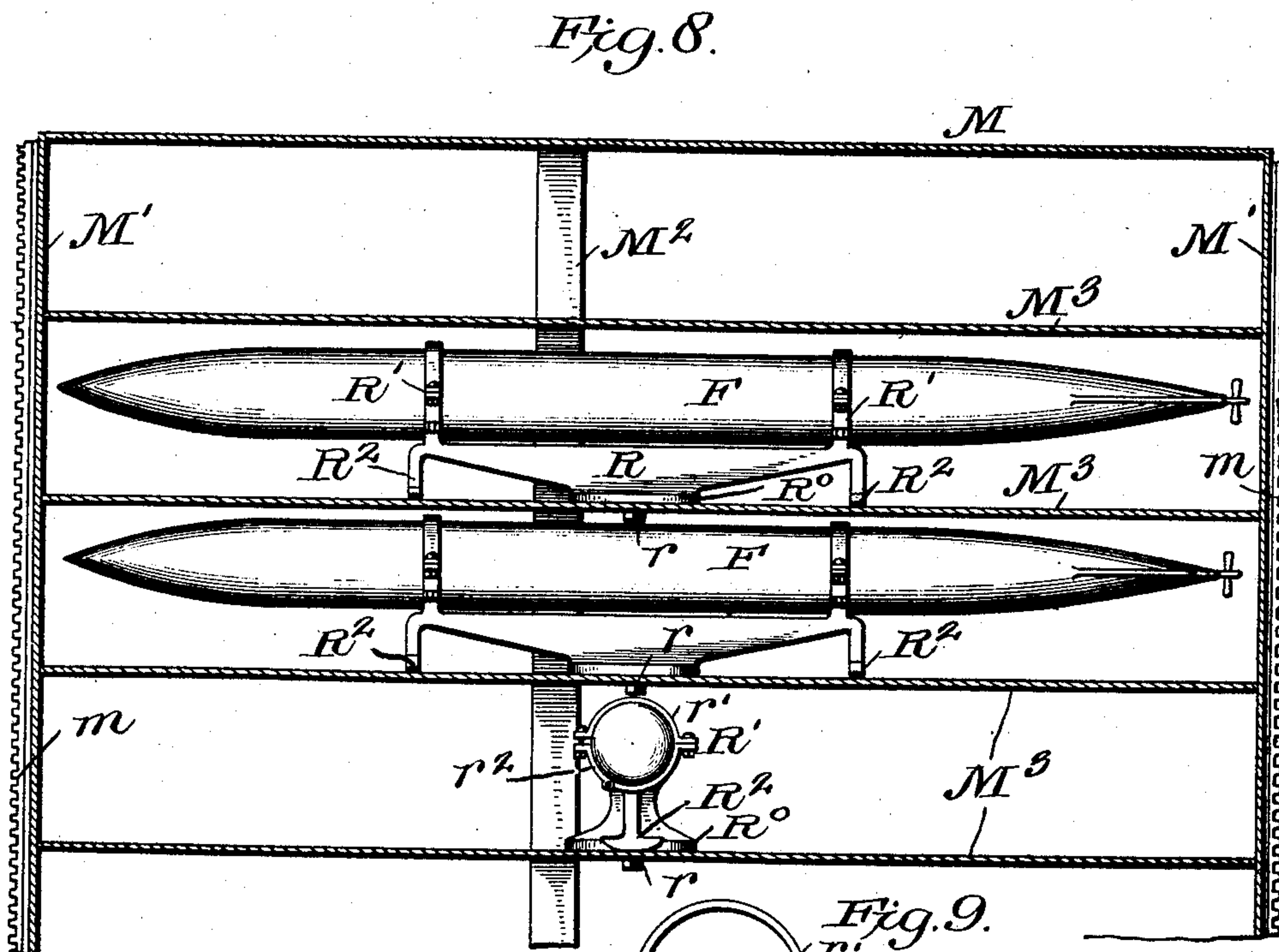
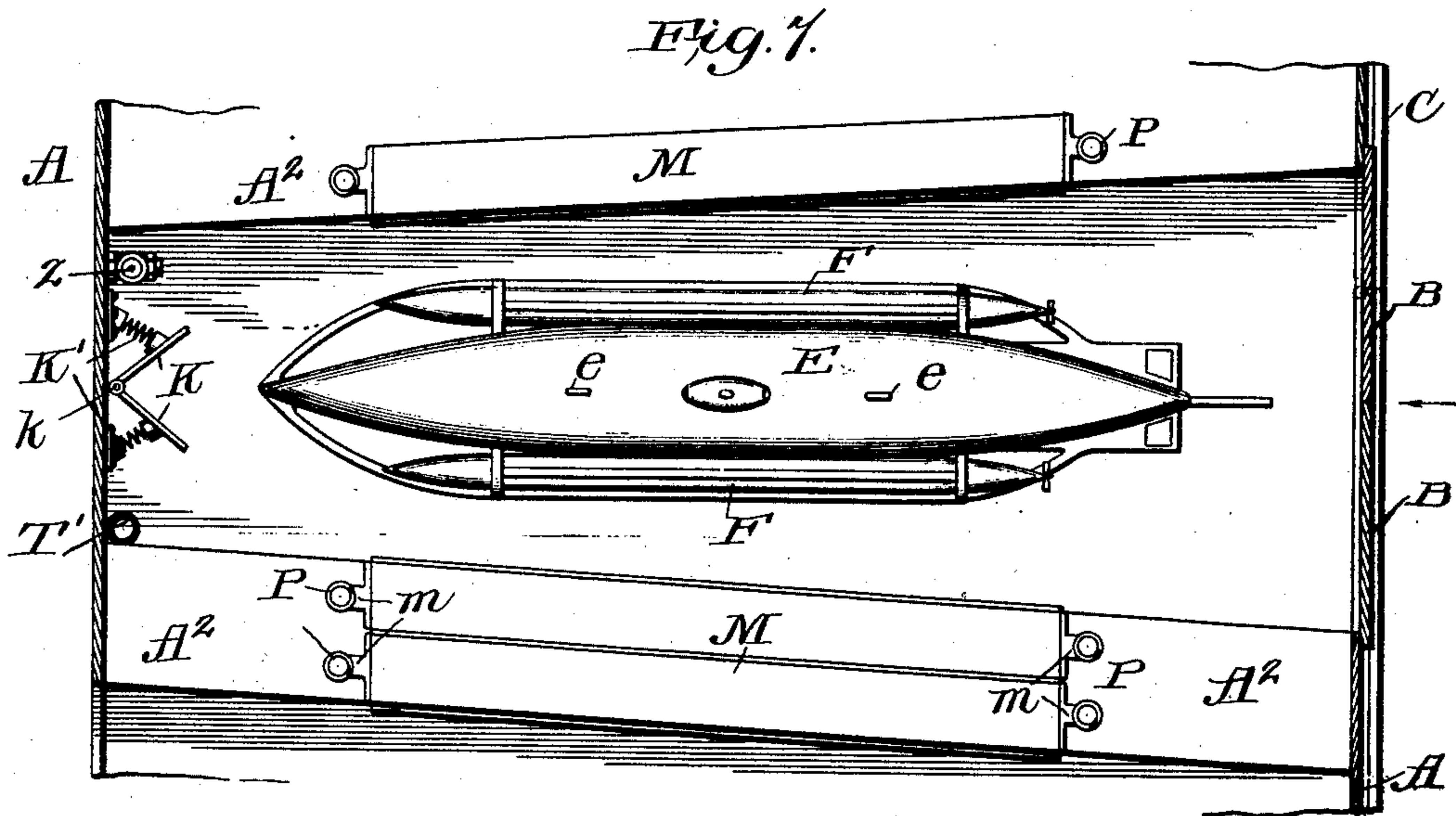
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3 SHEETS—SHEET 3.



Witnesses  
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# UNITED STATES PATENT OFFICE.

JOHN J. HARPAIN, OF THE UNITED STATES NAVY.

## APPARATUS FOR TRANSPORTING AND LAUNCHING BOATS.

No. 850,643.

Specification of Letters Patent.

Patented April 16, 1907.

Application filed April 23, 1906. Serial No. 313,267.

*To all whom it may concern:*

Be it known that I, JOHN J. HARPAIN, a citizen of the United States, of the United States Navy, serving on board United States steamship *Marblehead*, have invented certain new and useful Improvements in Apparatus for Transporting and Launching Boats; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to apparatus for transporting submarine torpedo-boats, so that they may be readily launched at sea whenever desired; and it also relates to means for securing said boats while in transport and to means for supplying said boats with automobile torpedoes and for storing said torpedoes in a safe and available position.

According to this invention a vessel is equipped to carry submarine boats, which vessel is so arranged that these boats may be carried in closed chambers, and the chambers may be flooded and the boats moved in or out by their own motive power. When the vessel is equipped to carry torpedo-boats, torpedo-magazines adjoining the chambers are provided in which are placed a number of torpedoes, and these magazines are so arranged that the torpedoes may be conveniently released and attached to the exterior of the submarine boat.

The submarine torpedo-boats and torpedoes are preferably located beneath the normal water-line of the submarine-boat carrier, so as to be protected against gun-fire, and where torpedo-boats are to be carried the carrier should preferably have a very high speed, but where submarine boats, for other than war purposes, are carried the factor of speed is not essential.

My invention will be understood by reference to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

Figure 1 is a side elevation of a submarine-boat carrier constructed according to my invention and shows three of the chambers for carrying the boats closed and the fourth one open, with a submarine boat floating in the open chamber. Fig. 2 shows a plan view of the submarine-boat carrier shown in Fig. 1. Figs. 1 and 2 are mainly diagrammatic, omitting many parts of the structure not relating

to the invention. Fig. 3 is a detail, on an enlarged scale, showing, in side elevation the doors for closing one of the boat-carrying chambers, with means for sliding these doors longitudinally, parts being broken away. Fig. 4 is a similar view to Fig. 3, except that it shows the interior of the chamber with the submarine torpedo-boat, one of the torpedo-magazines, and the racks for raising the magazines, parts being broken away, parts in section, and parts in elevation. Fig. 5 shows a section along the line 5 5 of Figs. 3 and 4 and looking in the direction of the arrows, the torpedo-boat being shown in side elevation. Fig. 6 is a detail showing the buffer arrangement for centering the torpedo-boat on its cradle, being a section along the line 6 6 of Fig. 5 and looking down. Fig. 7 is a plan view of the interior of one of the torpedo-boat chambers and of the contiguous magazines, the deck above being removed. Fig. 8 shows a vertical longitudinal section through one of the torpedo-cases, showing the torpedo-case in the raised position, with one of the torpedoes rotated to the position for attaching the war-head; and Fig. 9 is a detail showing one of the devices for holding the torpedo in the case.

A represents any suitable marine vessel provided with the usual decks, such as A', and gunwales, such as A°. This vessel may be driven by any suitable motive power, such as the twin screws X, carried by propeller-shafts X'. This vessel is provided with a plurality of submarine-boat compartments 1 2 3 4 5 6 7 8 which may be distributed throughout the boat in any convenient way, I have shown four of these chambers provided forward of the engine-room and four abaft the same. Access may be had to each of these compartments in any convenient way, as by a hatch y from the deck above, and these compartments may be flooded either by opening the doors B B, as will be hereinafter described, or through suitable sea-cocks Z. These compartments are preferably tapered in reverse directions to permit the requisite longitudinal movement of the doors B B for closing the compartments and at the same time secure a larger number of compartments in a given length than would be possible if the compartments had parallel sides. Furthermore, by making the compartments flare outward toward the doors the boats, which are moved in in the



direction of the arrows in Fig. 2 have a wide gate for entrance.

The doors B B slide horizontally within suitable guides C C, which are secured to the hull of the ship. These doors are each provided with racks  $b$ , meshing in the pinions D, carried by the shafts  $d$ , which shafts are driven from any convenient source of power, so that the doors B B may be slid backward or forward, as required. These pinions D are mounted in suitable hoods  $c$ , forming part of the guides C, and suitable tightening-wedges for jamming the doors B B tight on their seats may be provided, such as are well known in the power operation of sliding horizontal doors on board ship, as seen, for instance, in the patent to D. W. Taylor, No. 797,986, granted August 22, 1905.

The apparatus for moving these doors and for tightening the same on their seats does not constitute part of my present invention, as any suitable and well-known apparatus for that purpose may be provided.

E represents a submarine torpedo-boat generally similar to the boat described and claimed in my Patent No. 800,101, except that four torpedoes F on a side are shown instead of two on each side, as shown in the patent. The details for connecting the torpedo to the boat and for launching and firing the same may be similar to that shown in my patent referred to or of any other convenient form. This boat rests in a suitable cradle G, and additional chocks may be provided, if desired. The upper part of the boat is held against scending longitudinally as the ship rolls by means of a suitable bridle, such as the chains H and H', secured to the eyes  $e$ , rigidly attached to the submarine boat. One or both of these chains may be adjusted to the requisite tension by means of suitable turnbuckles  $h$ . (See Fig. 5.)

In order to center the boat in the cradle as it enters and to prevent injury either to the boat or to the opposite skin plating of the ship, a V-shaped buffer K is provided, which is pivoted, as at  $k$ , and is backed by stout springs K', which buffer will direct the nose of the boat into the central position fair for resting in the cradle G.

At each side of each of the boat-chambers a partition-chamber A<sup>2</sup> is provided, in which are mounted the vertical movable torpedo-cases M. These torpedo-cases are arranged like a bookcase, being provided with end pieces M', one or more stiffeners M<sup>2</sup>, and a series of shelves M<sup>3</sup>. The end pieces M' carry racks  $m$ , which mesh in worms P, mounted on shafts  $p$ , which carry bevel-gears  $p'$ , meshing with bevel-gears  $q$ , mounted on a shaft Q. These shafts Q are moved in unison, so that both ends of the torpedo-case may be moved up and down together.

Any other suitable gearing for moving the

torpedo-cases up and down may be provided, and I do not mean to limit this invention to any particular form of lifting or lowering apparatus.

The torpedo-cases are open front and back between the shelves M<sup>3</sup>, and the torpedo is carried in a holder R, which is pivoted to one of these shelves and may be clamped thereto, as indicated at  $r$  in Fig. 9. These torpedo-holders R have annular holding-clips R', including the upper cap-square  $r'$  and the pivoted segment  $r^2$ , and this upper cap-square is adapted to be removed and the pivoted segment swung down, as shown in Fig. 4, so that the torpedo may be readily removed from the holder.

The torpedo-holder R is pivoted to rotate about its base R<sup>0</sup>, so that the torpedo may be swung with its nose clear of the carrier for the purpose of attaching or removing the war-head or for other purposes, as indicated at the bottom of Fig. 9. To steady the torpedo in the case, the torpedo-holder R is provided with steadying-legs R<sup>2</sup>.

The torpedo-case is caused to move vertically above the deck by means of the worms P and racks  $m$ , already described, and the torpedoes are put in place and the torpedo-case is returned to the lowered position, when it will assume the position indicated to the right of Fig. 4. Suitable doors  $m'$  and clamping devices  $m^2$  may be provided for each of the torpedo-shelves, if desired; but these are not necessary and may be omitted, if desired.

The operation of the device is as follows: The submarine boats without torpedoes being afloat, are conveyed, either under their own power or by hauling-lines, to the carrier and are propelled or drawn into their respective compartments, the doors B B being open and the compartment or compartments being flooded. It will be obvious that the various compartments may be opened *seriatim* or in groups. The buffer K will guide the nose of the boat in the proper position relative to the cradle and will prevent the boat from injuring the skin-plates of the ship. If it is desired to transport the boats without torpedoes to any distant point, the doors B B are closed, the water in the chamber is partly pumped out, the boat is guided to her cradle G, and the bridles H H' are hooked on and properly adjusted by means of the turnbuckles  $h$ . The rest of the water in the compartment is then pumped out, and the boat is left resting in her cradle G and held against scending by the bridles, as aforesaid.

Any suitable form of cradle and any suitable substitute for the bridles may be adopted, if desired.

If it is desired to attach the torpedoes to the boat, this may be most conveniently



done by flooding or partly flooding the compartment in which the boat is carried. Thus, for instance, if the compartment is partly flooded the two lower torpedoes may be released from and floated out of their respective holders and may be secured onto the lower portion of the hull of the boat, as indicated in Fig. 4.

The torpedoes have a small reserve buoyancy and can be readily handled when floating, so that one or more operators may go down through the hatch *y* and disengage the floating torpedoes from their holders and move same while submerged beneath the water in their appropriate holders on the boat. It would be more convenient to float in the lower torpedoes and then the upper, the operator or operators standing partly immersed either on the bottom of the chamber or on the projections of the torpedo-boat.

In removing the torpedoes from the boat for restoring same in their cases the upper torpedoes should preferably be removed first, as the water-level is lowered in the compartment. The compartment may be pumped out by any suitable pumping arrangement, such as the pipes *T* and the branch pipes *T'*, controlled by valves *t*, and connected to pumps (not shown) in the engine-room.

The compartments containing the torpedoes may be flooded in any convenient way, as by partly opening the doors or by a sea-cock *z*. (See Figs. 4 and 5.)

In order to load or unload the torpedo-cases, these may be moved upward by means of the racks *m* and worms *P* and the torpedoes inserted or removed, and then these cases may be returned to the initial position.

If it is desired to put on or take off the war-head from any torpedo, this may be done by hoisting the torpedo-case high enough to have the torpedo-holder clear the deck *A'* and then swinging the torpedo-holder *R* about its pivot *r* until the nose of the torpedo is clear of the torpedo-case, and then the war-head may be put on or taken off, and the torpedo may be swung back to the initial position.

While the apparatus is primarily intended for use with submarine torpedo-boats, it may also be used with small torpedoes of any description or with small submarine boats of any description, the main idea of the invention being to carry such boats for long distances and then have them ready for launching and for use at short notice and also to furnish a suitable base to which these boats may return and where they may be housed in safety when not actually cruising.

The description of my invention is intended to show general ideas only with the omission of as many mechanical details as is practicable in order to facilitate comprehension of the invention.

It will be understood that the herein-described mechanical details may be widely varied without departing from the spirit of the invention.

I claim, broadly, as new—

1. A marine vessel adapted to transport and to launch smaller vessels, provided with a plurality of reversely-disposed tapered transverse compartments extending above and below the water-line, doors closing the wide end of each compartment and opening outboard and adapted to permit the ingress and egress of the smaller vessel, and means for securing the smaller vessel in the compartment, substantially as described.

2. A marine vessel adapted to transport and to launch smaller vessels, provided with a plurality of reversely-disposed tapered transverse compartments extending above and below the water-line, doors closing the wide end of each compartment and opening outboard and adapted to permit the ingress and egress of the smaller vessel, means for flooding and emptying the compartment, and means for securing the smaller vessel in the compartment when the compartment is wholly or partly emptied of water, substantially as described.

3. A marine vessel adapted to transport and to launch smaller vessels, provided with a plurality of reversely-disposed tapered transverse compartments extending above and below the water-line, sliding doors closing the wide end of each compartment and opening outboard and adapted to permit the ingress and egress of the smaller vessel, and means for securing the smaller vessel in the compartment, substantially as described.

4. A marine vessel adapted to transport and to launch smaller vessels, provided with one or more compartments extending above and below the water-line, doors on one side of the compartment opening outboard and adapted to permit the ingress and egress of the smaller vessel, a guiding-buffer on the side of the compartment opposite said doors, a cradle in said compartment, and means for securing the smaller vessel on said cradle, substantially as described.

5. A marine vessel adapted to transport and to launch smaller vessels, provided with one or more compartments extending above and below the water-line, doors on one side of the compartment opening outboard and adapted to permit the ingress and egress of the smaller vessel, a guiding-buffer on the side of the compartment opposite said doors, a cradle in said compartment, means for securing the smaller vessel on said cradle, means for flooding and for emptying the compartment, and means for securing the smaller vessel in place on said cradle when the compartment is wholly or partly emptied of water, substantially as described.



6. A marine vessel adapted to transport and to launch smaller vessels; provided with a plurality of reversely-disposed tapered transverse compartments extending above and below the water-line, sliding doors closing the wide end of each compartment and opening outboard and adapted to permit the ingress and egress of the smaller vessel, a buffer on the side of said compartment opposite said doors, and means for securing the smaller vessel in the compartment, substantially as described.

7. A marine vessel adapted to transport and to launch smaller vessels, provided with a plurality of reversely-disposed tapered transverse compartments extending above and below the water-line, substantially water-tight sliding doors normally closing the wide end of each compartment and adapted when open to permit the ingress and egress of the smaller vessel, means for flooding and for emptying the compartment, and means for securing the smaller vessel in the compartment when the compartment is wholly or partly emptied of water, substantially as described.

8. A marine vessel adapted to transport and to launch smaller vessels, provided with a plurality of reversely-disposed tapered transverse compartments extending above and below the water-line, substantially water-tight sliding doors normally closing the wide end of each compartment and adapted when open to permit the ingress and egress of the smaller vessel, a cradle in said compartment, and means for securing the smaller vessel on the cradle, substantially as described.

9. A marine vessel adapted to transport and to launch torpedo-boats, provided with transverse compartments extending above and below the water-line, with doors opening outboard and adapted to permit the ingress and egress of the torpedo-boat, torpedo-magazines at one or both sides of said chambers, and means for securing the smaller vessel in the compartment, substantially as described.

10. A marine vessel adapted to transport and to launch torpedo-boats, provided with transverse compartments extending above and below the water-line, doors opening outboard and adapted to permit the ingress and egress of the torpedo-boat, torpedo-magazines located at the side of each compartment, means for flooding and emptying the compartment, and means for securing the torpedo-boat in the compartment when the compartment is wholly or partly emptied of water, substantially as described.

11. A marine vessel adapted to transport and to launch torpedo-boats, provided with transverse compartments extending above and below the water-line, sliding doors opening outboard and adapted to permit the in-

gress and egress of the torpedo-boat, torpedo-magazines located on each side of each compartment, and means for securing a smaller vessel in the compartment, substantially as described.

12. A marine vessel adapted to transport and to launch a torpedo-boat, provided with a compartment extending above and below the water-line, substantially water-tight sliding doors normally closing said compartment but opening outboard and adapted to permit the ingress and egress of the torpedo-boat, means for flooding and for pumping out said compartment, means for securing the torpedo-boat in the compartment when it is wholly or partly emptied of water, and torpedo-magazines located at each side of said compartment and opening into said compartment, substantially as described.

13. A marine vessel adapted to transport and to launch a torpedo-boat, provided with a compartment extending above and below the water-line, substantially water-tight sliding doors normally closing said compartment but opening outboard and adapted to permit the ingress and egress of the torpedo-boat, means for flooding and for pumping out said compartment, means for securing the torpedo-boat in the compartment when it is wholly or partly emptied of water, torpedo-magazines located at each side of said compartment and opening into said compartment, with torpedo-carriers removably mounted in said magazines, and means for raising and lowering said torpedo-carriers, substantially as described.

14. A marine vessel adapted to transport and to launch torpedo-boats, provided with compartments extending above and below the water-line, substantially water-tight sliding doors normally closing said compartment but opening outboard and adapted to permit the ingress and egress of the torpedo-boat, means for flooding and pumping out each compartment, means for securing the torpedo-boat in the compartment when the compartment is wholly or partly emptied of water, and torpedo-magazines located at each side of said compartment and opening into said compartment, substantially as described.

15. A marine vessel adapted to transport and to launch torpedo-boats, provided with compartments extending above and below the water-line, substantially water-tight sliding doors normally closing said compartment but opening outboard and adapted to permit the ingress and egress of the torpedo-boat, means for flooding and pumping out each compartment, means for securing the torpedo-boat in the compartment when the compartment is wholly or partly emptied of water, torpedo-magazines located at each side of said compartment and opening into said compartment with torpedo-carriers re-



movably mounted in said magazines, and means for raising and lowering said torpedo-carriers, substantially as described.

16. A marine vessel adapted to transport and to launch torpedo-boats, provided with transverse compartments extending above and below the water-line, with doors opening outboard and adapted to permit the ingress and egress of the torpedo-boat, torpedo-magazines at one or both sides of said compartments, torpedo-carriers in said magazines comprising a series of shelves with means for attaching a torpedo to each shelf, means for raising and lowering said carriers, and means for securing the torpedo-boat in the compartment, substantially as described.

17. A marine vessel adapted to transport and to launch torpedo-boats, provided with transverse compartments extending above and below the water-line, doors opening outboard and adapted to permit the ingress and egress of the torpedo-boat, torpedo-magazines located at the side of each compartment, torpedo-carriers in said magazines comprising a series of shelves with means for attaching a torpedo to each shelf, means for raising and lowering said carriers, means for flooding and emptying the compartment, and means for securing the torpedo-boat in the compartment when the compartment is wholly or partly emptied of water, substantially as described.

18. A marine vessel adapted to transport and to launch torpedo-boats, provided with transverse compartments extending above and below the water-line, sliding doors opening outboard and adapted to permit the ingress and egress of the torpedo-boat, torpedo-magazines located on each side of each compartment, torpedo-carriers in said magazines comprising a series of shelves with means for attaching a torpedo to each shelf, means for raising and lowering said carriers, and means for securing the torpedo-boat in the compartment, substantially as described.

19. A marine vessel adapted to transport and to launch a torpedo-boat, provided with a compartment extending above and below the water-line, substantially water-tight sliding doors normally closing said compartment but opening outboard and adapted to permit the ingress and egress of the torpedo-boat, means for flooding and for pumping out said compartment, means for securing the torpedo-boat in the compartment when it is wholly or partly emptied of water, torpedo-magazines located at each side of said compartment and opening into said compartment, torpedo-carriers in said magazines comprising a series of shelves with means for attaching a torpedo to each shelf, and means for raising and lowering said carriers, substantially as described.

20. A marine vessel adapted to transport and to launch a torpedo-boat, provided with

a compartment extending above and below the water-line, substantially water-tight sliding doors normally closing said compartment but opening outboard and adapted to permit the ingress and egress of the torpedo-boat, means for flooding and for pumping out said compartment, means for securing the torpedo-boat in the compartment when it is wholly or partly emptied of water, torpedo-magazines located at each side of said compartment and opening into said compartment, with torpedo-carriers comprising a series of shelves removably mounted in said magazines with a torpedo-holder pivoted to each shelf, and means for raising and lowering said torpedo-carriers, substantially as described.

21. A marine vessel adapted to transport and to launch torpedo-boats, provided with compartments extending above and below the water-line, substantially water-tight sliding doors normally closing said compartment but opening outboard and adapted to permit the ingress and egress of the torpedo-boat, means for flooding and pumping out each compartment, means for securing the torpedo-boat in the compartment when the compartment is wholly or partly emptied of water, torpedo-magazines located at each side of said compartment and opening into said compartment, torpedo-carriers in said magazines comprising a series of shelves with means for attaching a torpedo to each shelf, and means for raising and lowering said carriers, substantially as described.

22. A marine vessel adapted to transport and to launch torpedo-boats, provided with compartments extending above and below the water-line, substantially water-tight sliding doors normally closing said compartment but opening outboard and adapted to permit the ingress and egress of the torpedo-boat, means for flooding and pumping out each compartment, means for securing the torpedo-boat in the compartment when the compartment is wholly or partly emptied of water, torpedo-magazines located at each side of said compartment and opening into said compartment with torpedo-carriers comprising a series of shelves removably mounted in said magazines with a torpedo-holder pivoted to each shelf, and means for raising and lowering said torpedo-carriers, substantially as described.

23. A marine vessel adapted to transport and to launch torpedo-boats, provided with transverse compartments extending above and below the water-line, with doors opening outboard and adapted to permit the ingress and egress of the torpedo-boat, torpedo-magazines at one or both sides of said compartments, torpedo-carriers in said magazines comprising a series of shelves with means for attaching a torpedo to each shelf, racks and gearing meshing in said racks, for



raising and lowering said carriers, and means for securing the torpedo-boat in the compartment, substantially as described.

24. A marine vessel adapted to transport  
5 and to launch torpedo-boats, provided with transverse compartments extending above and below the water-line, doors opening outboard and adapted to permit the ingress and egress of the torpedo-boat, torpedo-magazines located at the side of each compartment,  
10 torpedo-carriers in said magazines comprising a series of shelves with means for attaching a torpedo to each shelf, racks and gearing meshing in said racks for raising and lowering said carriers, means for flooding  
15 and emptying the compartment, and means for securing the torpedo-boat in the compartment when the compartment is wholly or partly emptied of water, substantially as described.  
20

25. A marine vessel adapted to transport and to launch torpedo-boats, provided with transverse compartments extending above and below the water-line, sliding doors opening outboard and adapted to permit the ingress and egress of the torpedo-boat, torpedo-magazines located on each side of each compartment, torpedo-carriers in said magazines comprising a series of shelves with  
25 means for attaching a torpedo to each shelf, racks and gearing meshing in said racks for raising and lowering said carriers, and means for securing the torpedo-boat in the compartment, substantially as described.  
30

26. A marine vessel adapted to transport  
35 and to launch a torpedo-boat, provided with a compartment extending above and below the water-line, substantially water-tight sliding doors normally closing said compartment but opening outboard and adapted to  
40 permit the ingress and egress of the torpedo-boat, means for flooding and for pumping out said compartment, means for securing the torpedo-boat in the compartment when it is  
45 wholly or partly emptied of water, torpedo-magazines located at each side of said compartment and opening into said compartment, torpedo-carriers in said magazines comprising a series of shelves with  
50 means for attaching a torpedo to each shelf, and racks and gearing meshing in said racks for raising and lowering said carriers, substantially as described.

27. A marine vessel adapted to transport  
55 and to launch a torpedo-boat, provided with a compartment extending above and below the water-line, substantially water-tight sliding doors normally closing said compartment but opening outboard and adapted to

permit the ingress and egress of the torpedo-boat, means for flooding and for pumping out  
60 said compartment, means for securing the torpedo-boat in the compartment when it is wholly or partly emptied of water, torpedo-magazines located at each side of said compartment and opening into said compartment,  
65 with torpedo-carriers comprising a series of shelves removably mounted in said magazines with a torpedo-holder pivoted to each shelf, and racks and gearing meshing  
70 in said racks for raising and lowering said torpedo-carriers, substantially as described.

28. A marine vessel adapted to transport and to launch torpedo-boats, provided with compartments extending above and below  
75 the water-line, substantially water-tight sliding doors normally closing said compartment but opening outboard and adapted to permit the ingress and egress of the torpedo-boat, means for flooding and pumping out  
80 each compartment, means for securing the torpedo-boat in the compartment when the compartment is wholly or partly emptied of water, torpedo-magazines located at each side of said compartment and opening into  
85 said compartment, torpedo-carriers in said magazines comprising a series of shelves with means for attaching a torpedo to each shelf, and racks and gearing meshing in said racks for raising and lowering said carriers,  
90 substantially as described.

29. A marine vessel adapted to transport and to launch torpedo-boats, provided with compartments extending above and below  
95 the water-line, substantially water-tight sliding doors normally closing said compartment but opening outboard and adapted to permit the ingress and egress of the torpedo-boat, means for flooding and pumping out  
100 each compartment, means for securing the torpedo-boat in the compartment when the compartment is wholly or partly emptied of water, torpedo-magazines located at each side of said compartment and opening into  
105 said compartment with torpedo-carriers comprising a series of shelves removably mounted in said magazines with a torpedo-holder pivoted to each shelf, and racks and gearing meshing in said racks for raising and lowering  
110 said torpedo-carriers, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN J. HARPAIN.

Witnesses:

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