

No. 721,024.

PATENTED FEB. 17, 1903.

W. B. COWLES.  
BULKHEAD DOOR.

APPLICATION FILED AUG. 4, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 4.



Fig. 5.

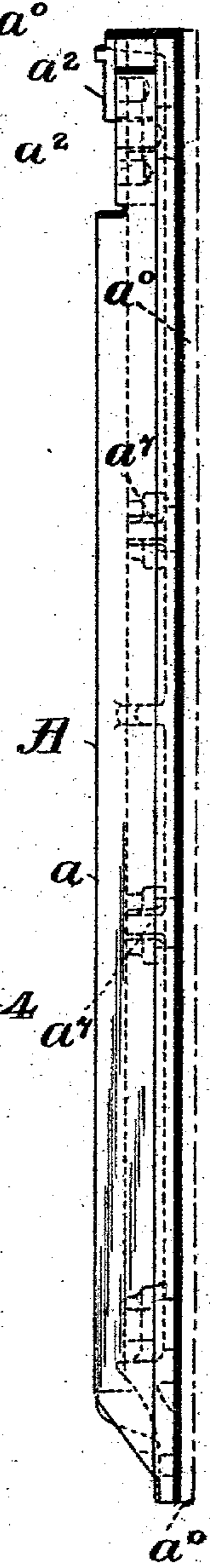


Fig. 1.

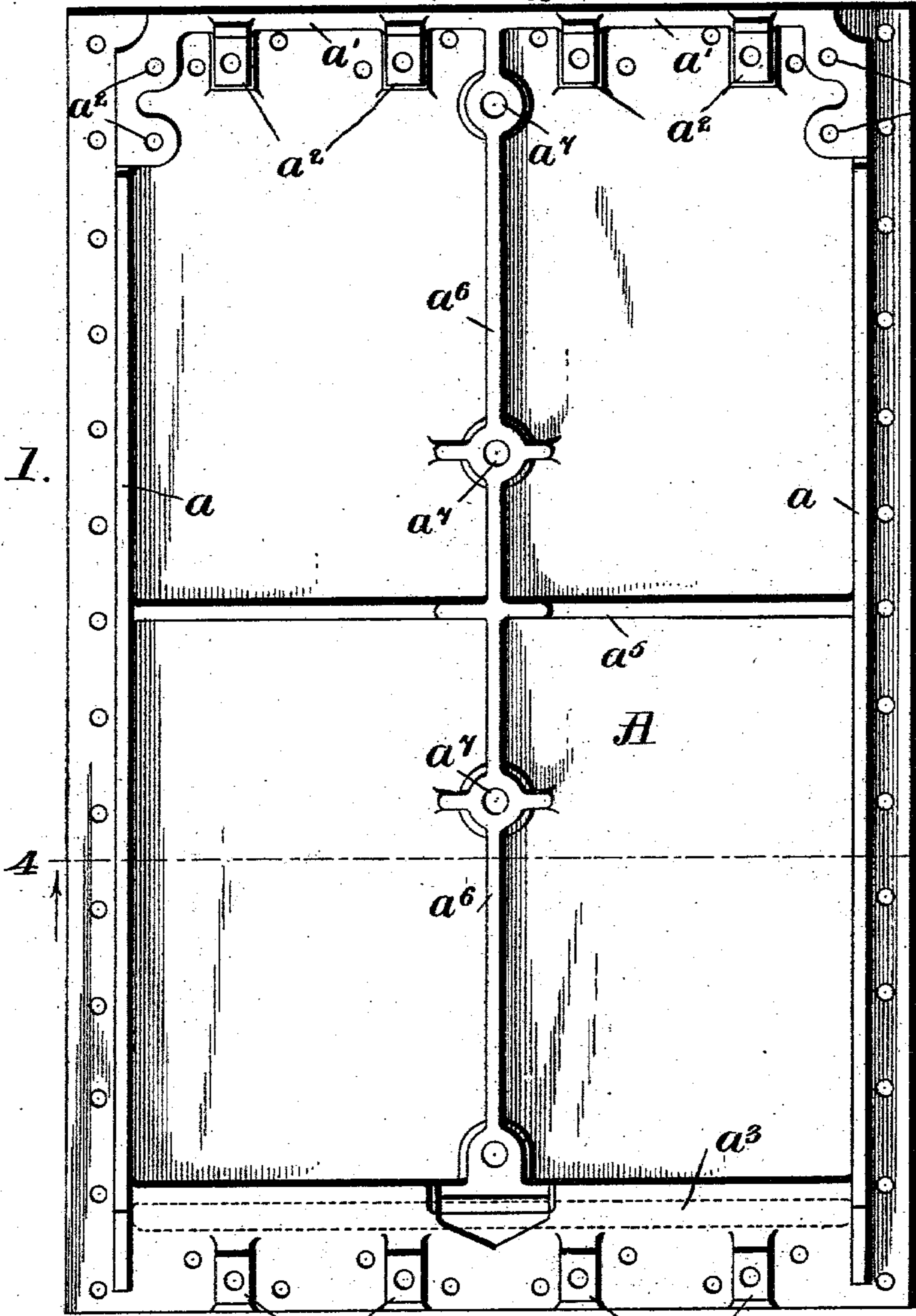
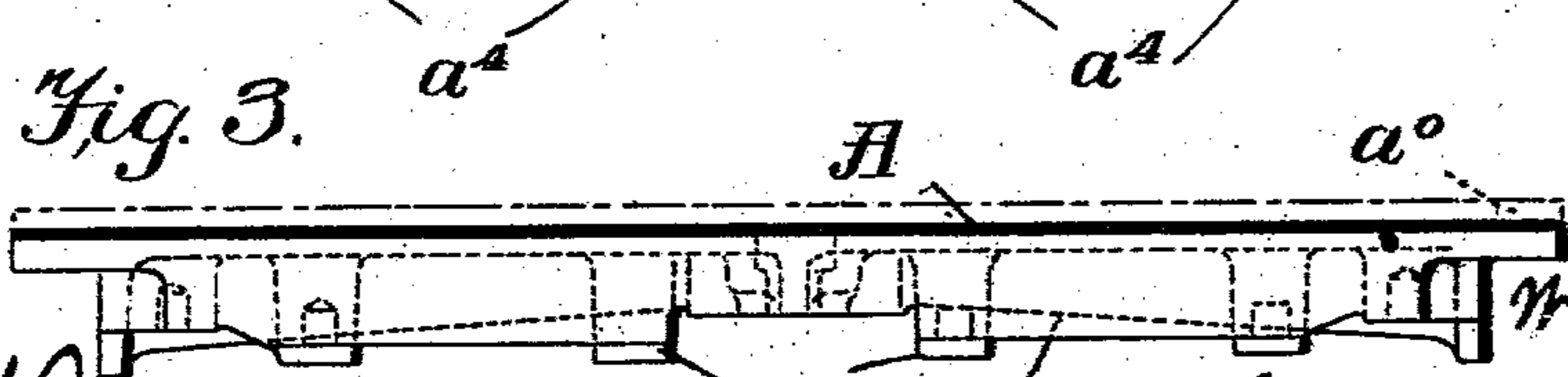


Fig. 3.



Witnesses

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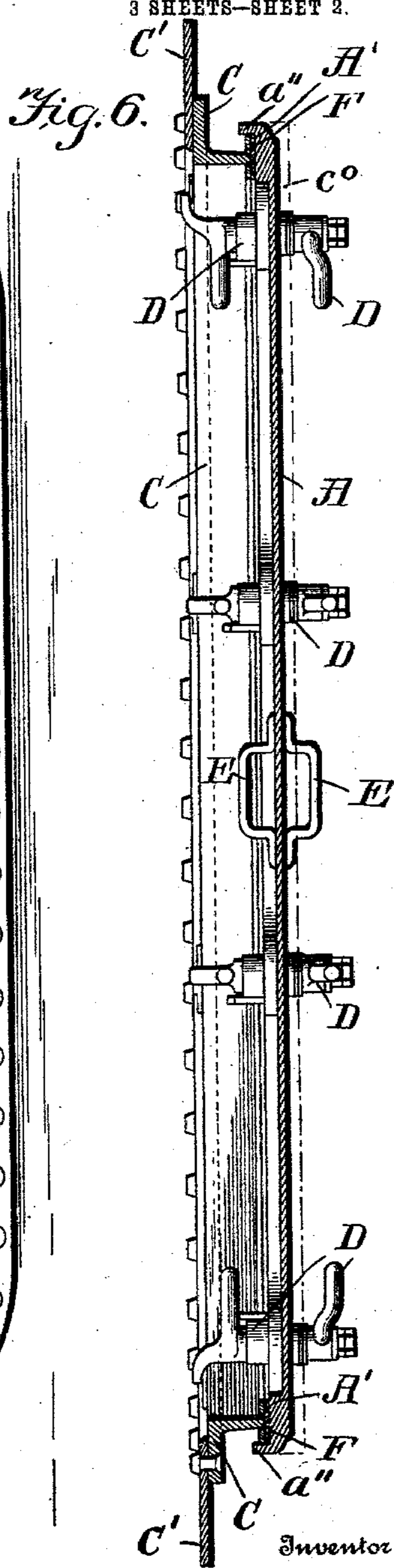
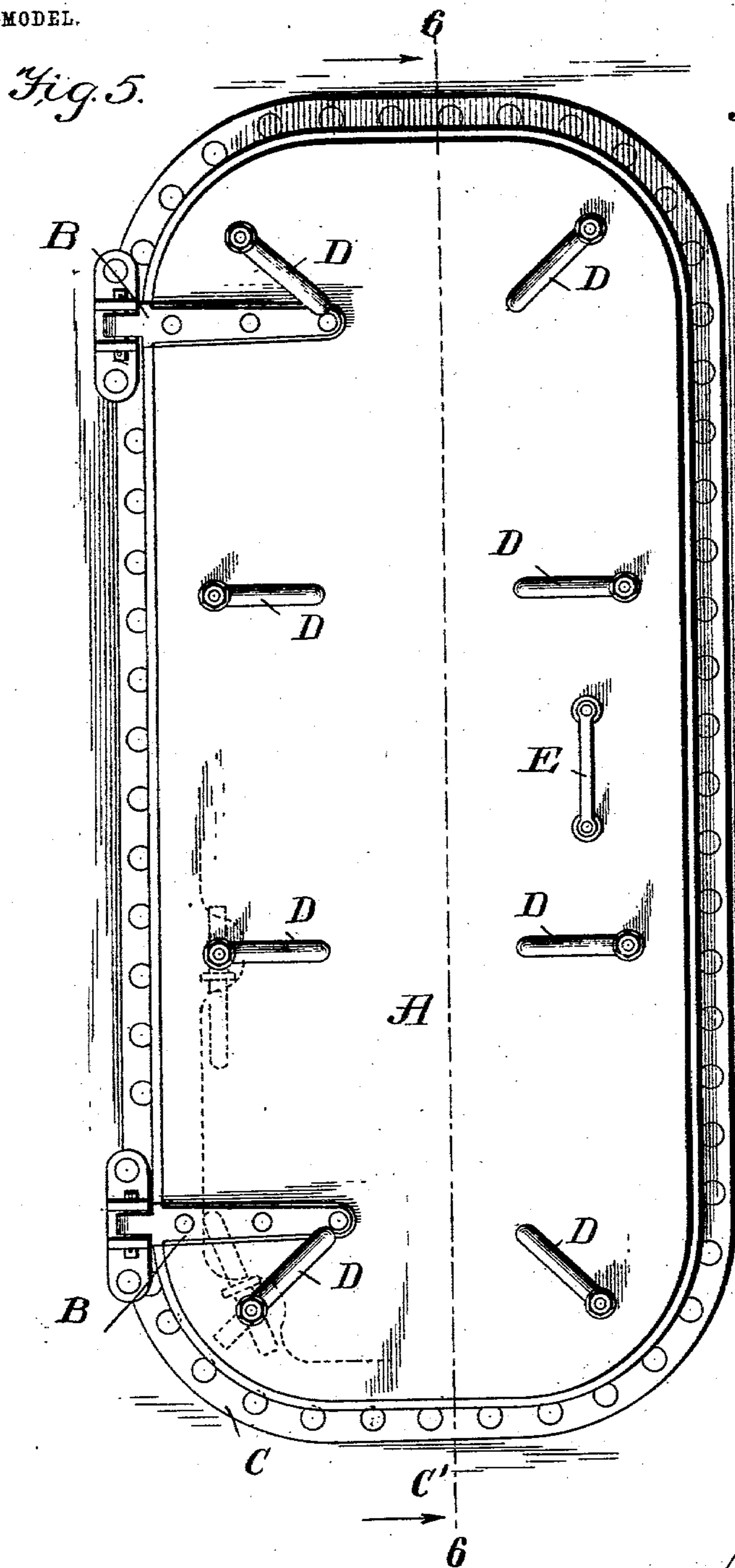
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3 SHEETS—SHEET 2.



Witnesses

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3 SHEETS—SHEET 3.

Fig. 7.

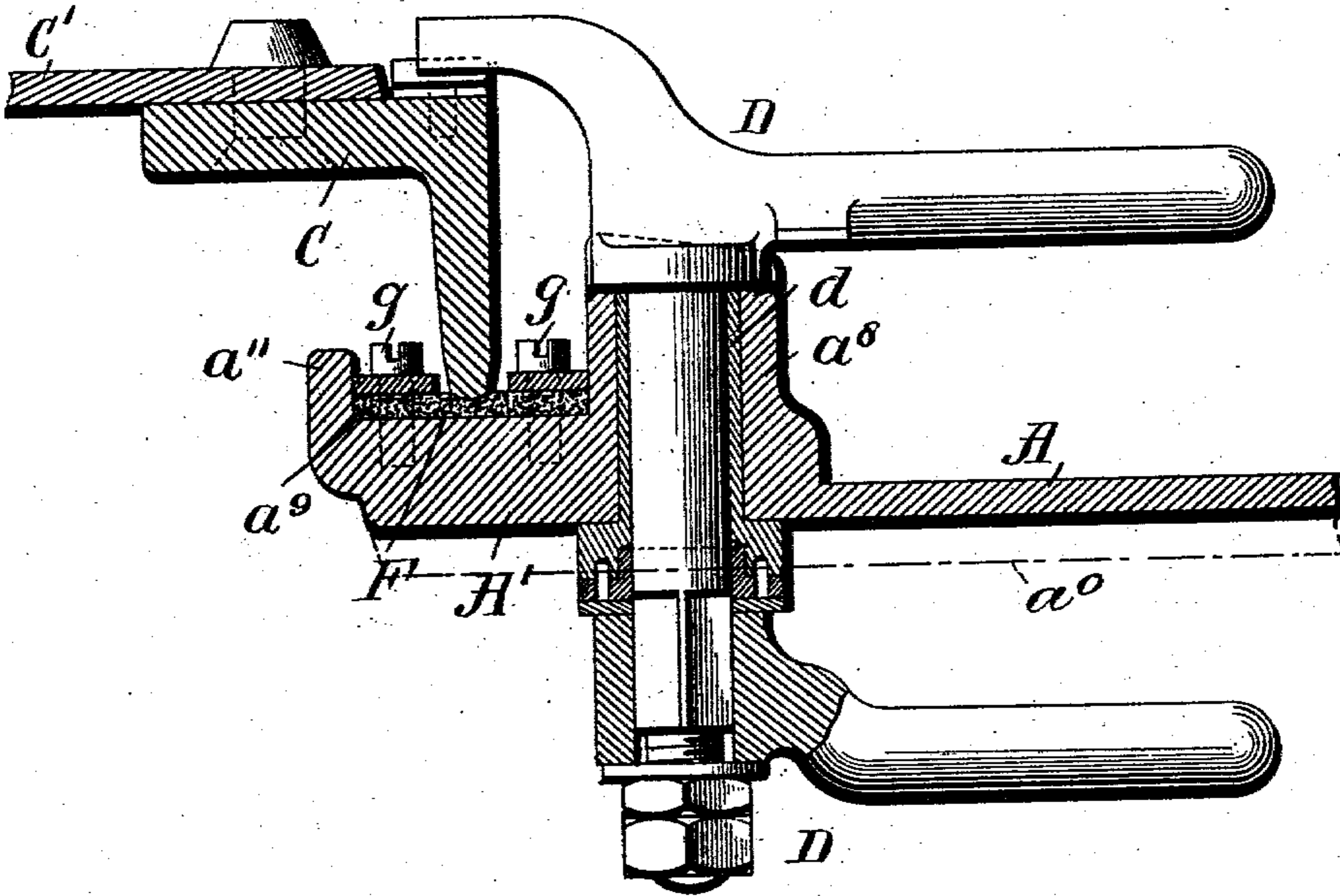
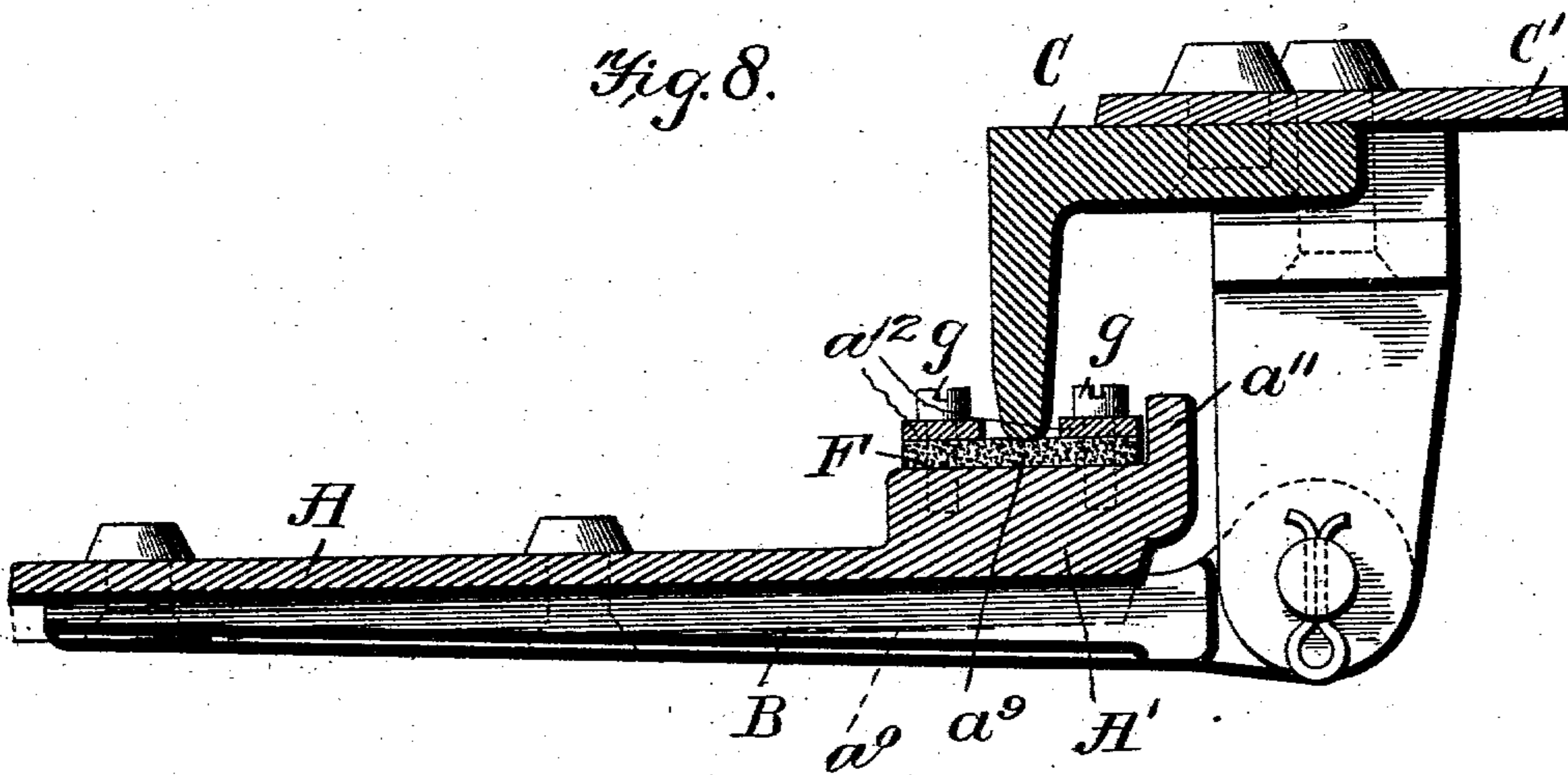


Fig. 8.



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# UNITED STATES PATENT OFFICE.

WILLIAM BARNUM COWLES, OF CLEVELAND, OHIO, ASSIGNOR TO "LONG ARM" SYSTEM COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF WEST VIRGINIA.

## BULKHEAD-DOOR.

SPECIFICATION forming part of Letters Patent No. 721,024, dated February 17, 1903.

Application filed August 4, 1902. Serial No. 118,327. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM BARNUM COWLES, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Bulkhead-Doors; 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 invention relates to improvements in water-tight bulkhead-doors for use on board ship; and it consists of certain novel features that will be hereinafter described and claimed.

In the manufacture of water-tight doors it has hitherto been the usual practice to make these doors of rolled iron or steel riveted to a cast frame or to a flanged frame. With this construction it is found difficult and expensive to make the joints tight, and in consequence the doors are expensive and not apt to fit snugly. Attempts have been made to cast the doors in one piece; but in such cases it has been found impracticable to make a steel casting of the required thinness and the doors have been too heavy for satisfactory use on board ship, taking up too much of the displacement of the vessel which is desired for other uses. Some brass composition is the only metal which can be cast in these large sheets of the required thinness, and brass is too expensive for commercial use in this way.

According to my invention I cast the door and its frame in one piece, but with one side flat, the steel casting being about twice the desired thickness of the door. I then plane down the door on the flat side to the desired thickness, and with a little machining on the edges, and after boring the usual holes for the tighteners, &c., it is ready for use.

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

Figure 1 represents a sliding bulkhead-door of the type shown in the "Long Arm" System Company's patents, Nos. 605,399, 608,838, and 631,698. Fig. 2 is a side elevation of the same. Fig. 3 is a plan view. Fig. 4 represents a sec-

tion along the line 4 4 of Fig. 1 looking upward. Fig. 5 represents a hand-operated bulkhead-door similar to those in use in the naval and merchant service, but constructed according to my invention. Fig. 6 represents a section along the line 6 6 of Fig. 5 and looking in the direction of the arrows. Fig. 7 is a detail showing the operation of the tighteners, and Fig. 8 is a detail showing the hinge of the door and the parts contiguous thereto.

Referring now to Figs. 1 to 4, A represents the door provided with side ribs  $a$  and an end rib  $a'$ , with bosses  $a^2$ , a bottom rib  $a^4$ , cross-rib  $a^5$ , and a longitudinal rib  $a^6$  with bosses  $a^7$ . In these bosses bolt-holes are bored to attach the various parts of the operating-gear to the door. One side of the door is cast flat and has a thickness corresponding to that indicated by the dotted line  $a^0$  in Figs. 2, 3, and 4. This flat face of the door is then planed down, leaving the door the desired thickness, as indicated in Fig. 4. The flanges of the door are cast somewhat thicker than the main portion to receive the tightening-rollers referred to in the patents aforesaid.

In the form of device shown in Figs. 5 to 8 the door A has a heavy rim  $A'$  with recesses on the back, as at  $a^9$ , to receive the gasket F. Exterior to the gasket is a rib  $a^{11}$ . The door, with its rim  $A'$  and this rib  $a^{11}$ , is cast in one piece, having one face flat and of a thickness corresponding to that indicated by the dotted line  $a^0$  in Figs. 6, 7, and 8. This flat portion is then planed away until the door is of the desired thickness. When the requisite machining is done, the holes for the tighteners D are made, hinges are put on, and the door is otherwise made ready for use.

The tighteners D (shown in detail in Fig. 7) are journaled in bosses  $a^8$  in the door-casting. For water-tightness and to avoid corrosion bushings  $d$  of some brass composition are preferably provided. The door is provided with a rubber gasket F, held in place by tap-bolts  $g$  and by the metal strips  $a^{12}$ . (See Fig. 8.) This gasket fits snugly against the frame C, which is fast to the bulkhead C'.

The construction of the tighteners not being a part of my invention will not be further described.

The hinges B are secured to the door in the manner indicated in Fig. 8.

Thus it will be seen that I provide a door made of a single piece of low-cost metal, which is of the desired thickness and which may be cheaply and quickly constructed without the expensive drilling, fitting, riveting, and calking and which at the same time is water-tight, strong, and durable.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. As an article of manufacture, a lightweight bulkhead-door, consisting of a single piece of cast metal having one of its faces plane and the other face provided with strengthening and retaining ribs, said door being made by casting a blank of about twice the required thickness and planing off one

face thereof until the door is reduced to the required thickness, substantially as described. 20

2. As an article of manufacture, a lightweight bulkhead-door, consisting of a single piece of cast-steel having one of its faces plane and the other face provided with circumferential strengthening and retaining ribs, said door being made by casting a blank of about twice the required thickness and planing off one face thereof until the door is reduced to the required thickness, substantially as described. 25 30

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

WILLIAM BARNUM COWLES.

Witnesses:

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