No. 806,596. PATENTED DEC. 5, 1905.

D. W. STIBBS.

BULKHEAD DOOR.

APPLICATION FILED SEPT. 23, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

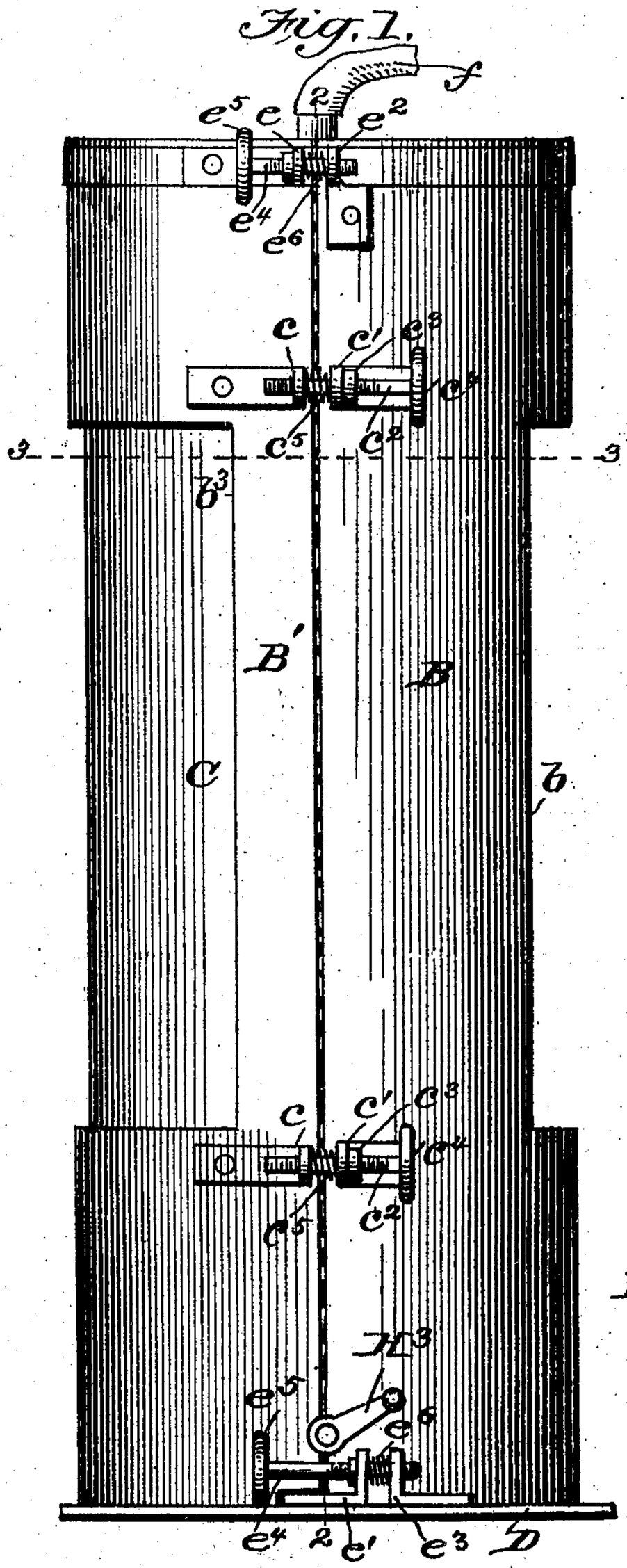


Fig. 4.

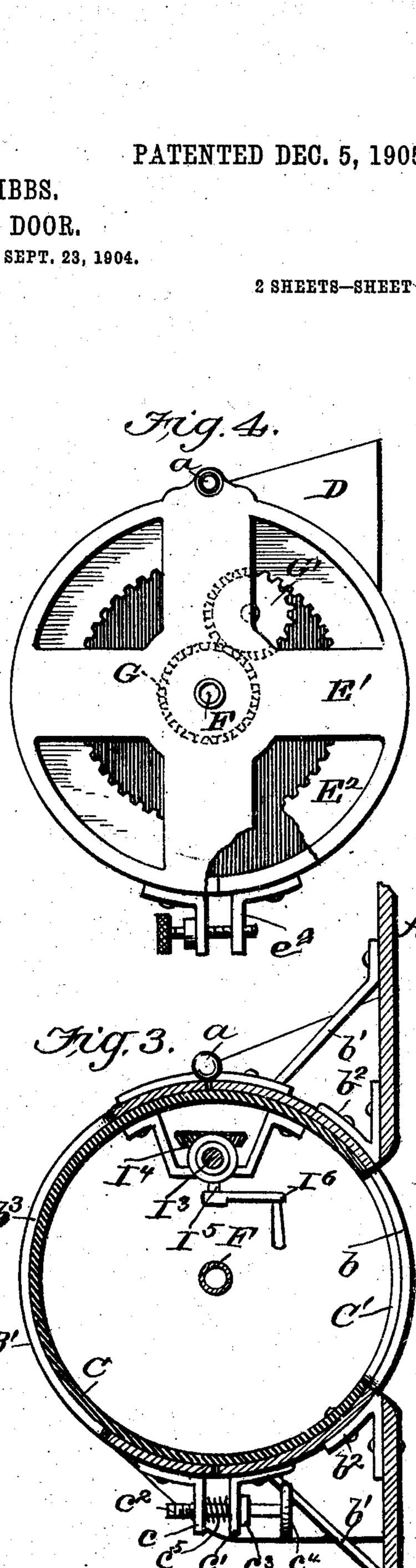
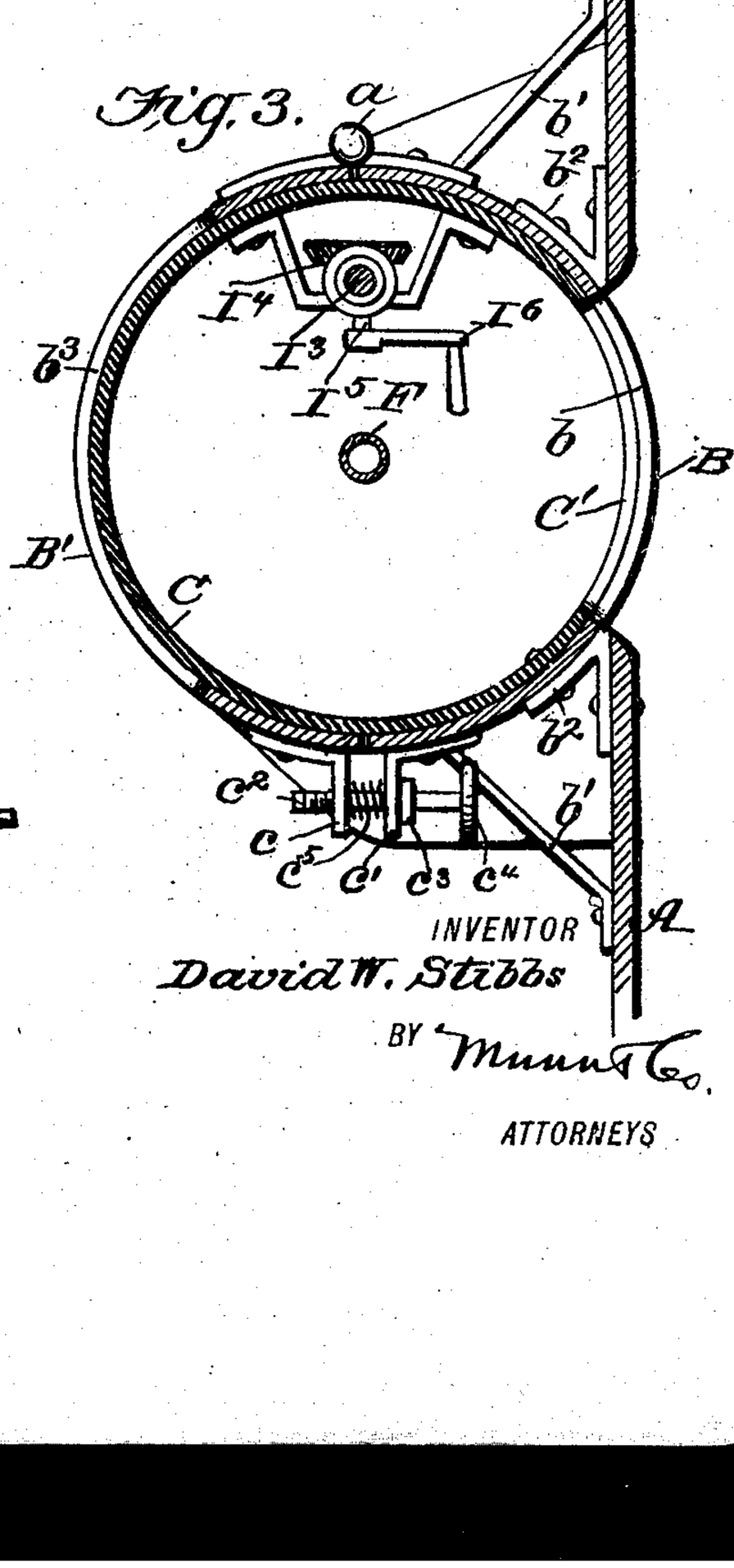


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 2.

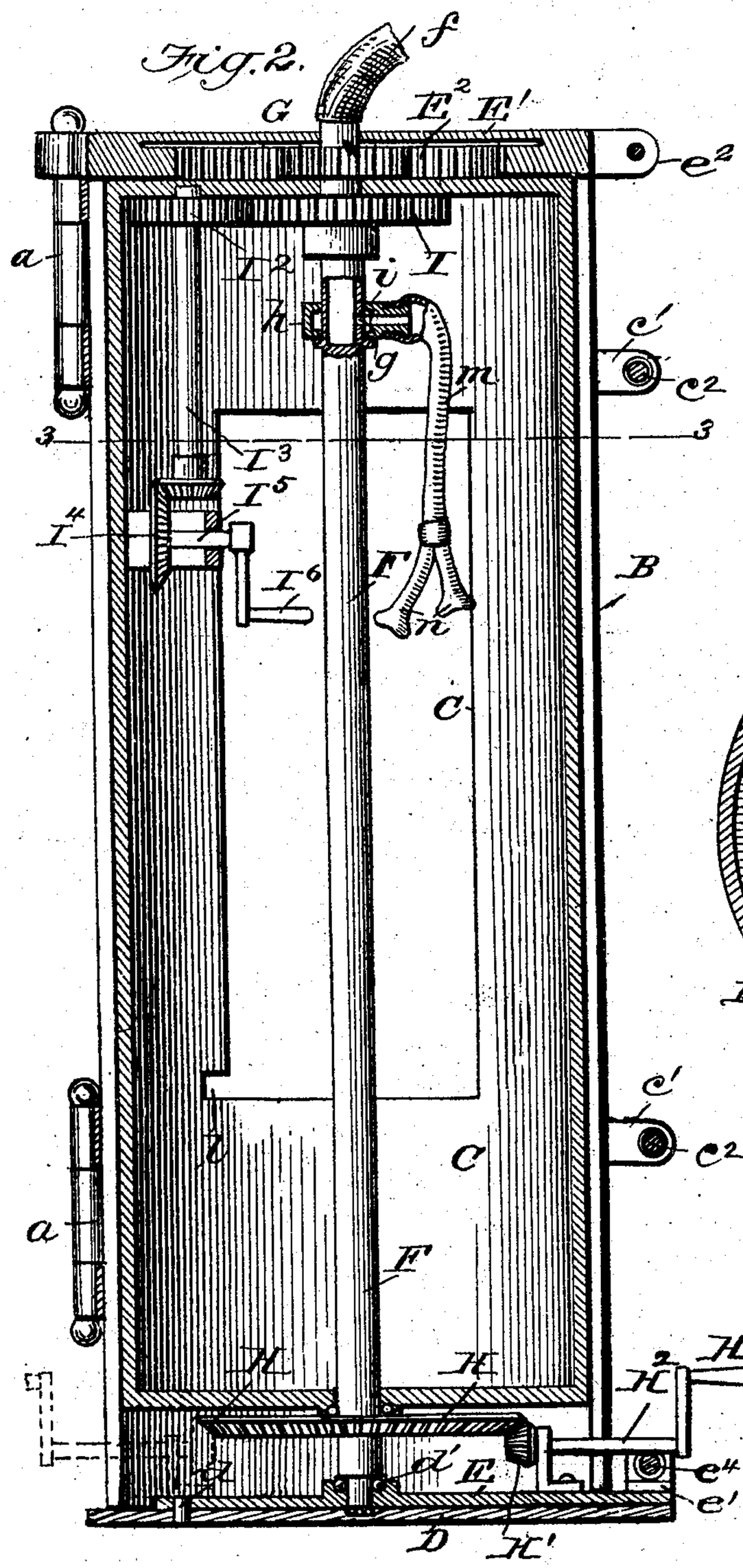
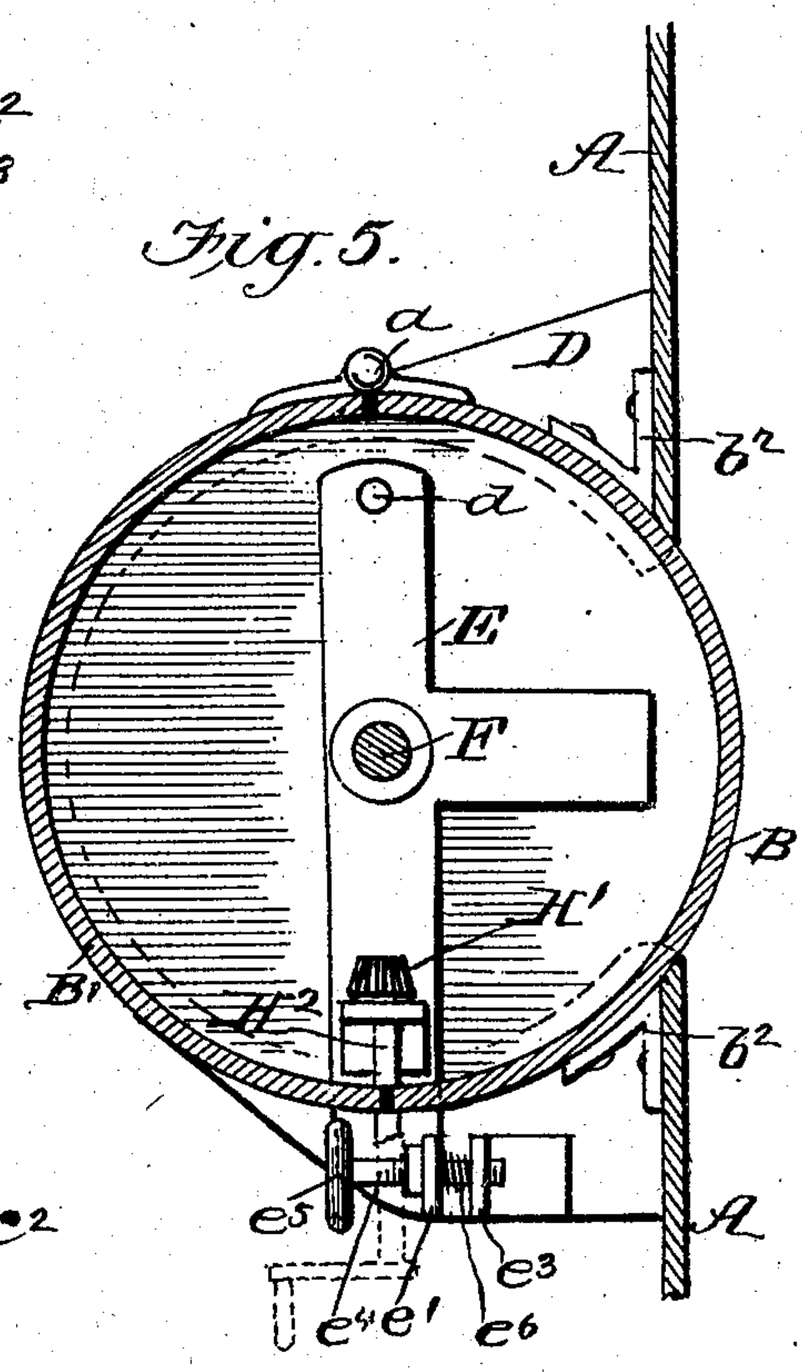


Fig. 5.



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UNITED STATES PATENT OFFICE.

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BULKHEAD-DOOR.

No. 806,596. Specification of Letters Patent. Patented Dec. 5, 1905.

Application filed September 23, 1904. Serial No. 225,621.

To all whom it may concern:

Be it known that I, DAVID WALDHAUER STIBBS, a citizen of the United States, residing at Puerto Cortez, in the Republic of Honduras, have invented a new and useful Improvement in Bulkhead-Doors, of which the following is a specification.

My invention is in the nature of an improvement in bulkhead-doors for ships, &c., designed to enable a person to pass from one side of a partition to another without at any time opening a through communication between the compartments or spaces on opposite sides of the partition. It is especially designed for permitting the escape of persons from the interior of a disabled submarine boat to the external space below water without allowing the unrestrained inrush of water to flood the boat. It is also applicable for location in the bulkheads of a ship anywhere and for the closure of ships' magazines in such a way as to preclude open or through communication between the magazine and the turrets or other compartments of the ship where an explosive flash would be likely to strike back into the magazines.

My invention relates to that class of devices in which a rotary cell with a door in one side is adjusted about its axis, so as to put its door first in communication with an opening in a surrounding casing and then be turned to put its door in communication with an opening on the opposite side of the casing, but never allowing an open communication through both sides of the casing at one time.

My improvements comprise adjustable means for maintaining a tight fit for the rotary cell against its casing, in means for inserting and removing the cell, in means for rotating the cell either from within or without, and in means for supplying air to the temporary occupant or occupants of the cell, as will be hereinafter fully described with reference to the drawings, in which—

Figure 1 is a side elevation. Fig. 2 is a vertical section through the door on line 2 2 of Fig. 1. Fig. 3 is a horizontal section on line 3 3 of Figs. 1 and 2. Fig. 4 is a top plan view, and Fig. 5 is a sectional plan of the bottom of the cell-casing.

In the drawings, A, Figs. 3 and 5, represents the side of the hull of a submarine boat which is constructed with a vertical opening through it large enough to permit the egress of a man. Firmly fixed to the side of the hull in vertical position is an upright cylindrical casing B B′, made in two diametrically-divided sections hinged at one side about a vertical axis *a*. The side B of the casing is formed with an opening *b*, corresponding in size to and registering with the opening in the hull of the boat. This side of the casing is stationary and is fixed strongly and rigidly to the side of the hull by braces *b′* and flanged plates b^2. The other side B′ of the cylindrical casing is movable about its hinge-axis *a* and has an opening b^3 in it somewhat larger than the opening in the other section. This opening b^3 faces the interior space of the boat and is the opening through which access is had to the rotary cell from within the boat. The two sections of the cylindrical casing are clamped together upon the cell (see Fig. 1) by means of lugs *c c* on one section and lugs *c′ c′* on the other section and a screw c^2 for each pair of lugs having a collar c^3 and hand-wheel c^4. This screw swivels in a lug *c′*, and its thread turns into a screw-threaded perforation in the other lug *c*, and a coil-spring c^5 is located between the lugs on the screw-shank and presses the two sections of the casing apart with a yielding pressure, while the screws draw the two sections together to produce a water-tight bearing on the cell. To make such bearing water-tight and yet free to turn, the interior of the cell-casing and the exterior of the cell are accurately turned and then finished with a ground joint that is kept properly lubricated and packed so that no water can get between.

The stationary section of the casing is fixedly mounted on a base-plate D, and on this base-plate is a swinging frame E, Fig. 5, adjustable in a horizontal plane about a pivot *d*, connecting it to the base-plate. This adjustable frame contains a ball-bearing step *d′*, in which turns the lower end of the central shaft F, that extends through the cell, turning loosely in the upper and lower heads thereof, and is journaled at the top in an adjustable frame E′, Fig. 4.

The cylindrical cell C has a single door C′ to register with the outer opening *b* in the case, and when the cell is turned one hundred and eighty degrees about its vertical axis this door passes from registration with the outer opening in the case and the hull to registra-

tion with the opening b^3 in the inner section of the case, and vice versa; but at no time is there any through communication between both inner and outer openings of the case, as one is closed when the other is open, and vice versa.

When a person wishes to pass entirely through the bulkhead-door, the cell is turned so that its door registers with the inner opening of the case. The person then enters the cell, and the cell is then turned until its door registers with the outer opening in the case and the opening through the hull, and then the person emerges from the cell into the water and rises to the surface.

To rotate the cell for the purpose just described, this may be accomplished both from the inside and the outside by the same train of mechanism, which I will now describe.

In the upper frame E′ of the case, which is relatively stationary, there is an annular gear E^2 with inwardly-projecting teeth. (See Figs. 2 and 4.) On the central shaft of the cell there is above and outside the cell-head a gear-wheel G, which is in mesh with and rotates an intermediate gear G′, turning on a stud on the top of the cell. This intermediate gear G′ is in mesh with the large stationary annular gear E^2, so that when the central shaft is turned the gears G G′ are rotated and G′, engaging with the stationary annular gear E^2, travels around the same and turns the entire cell about its central vertical shaft. This central shaft has below the floor of the cell a rigidly-attached bevel-gear H, and with it there meshes a small bevel-gear H′ on a horizontal shaft H^2, which protrudes through the side of the case and is provided with a crank H^3, by which the cell may be turned from the outside.

To turn the cell from the inside, a gear-wheel I is fixed to the shaft near the top of the cell and inside the same, and with this there engages a small gear-wheel I^2 on a vertical shaft I^3, which at the lower end receives rotary motion through bevel-gears I^4 and a short horizontal shaft I^5, bearing a crank-handle I^6.

It will be seen that there is through the opening in the side of the boat a considerable hydrostatic pressure against the cell, and if any looseness exists at the bearings this pressure would force the cell away from a water-tight bearing against the interior of the cell and allow water to leak between. To avoid this, I make the entire cell laterally adjustable outward against the water-pressure, so as to maintain a water-tight bearing between the cell and the outer section of the case. This is effected by the adjustable character of the two frames E E′, in which the cell is carried. These frames (see Figs. 1, 4, and 5) have each a perforated lug e and e', which cooperate with corresponding perforated lugs e^2 e^3 on the stationary part of the case, and through these lugs pass the screws e^4, with hand-wheels e^5 and springs e^6, by means of which the journal-bearings of the cell, and consequently the cell itself, are adjusted outwardly to make a tight fit to resist external pressure.

To supply the occupant or occupants of the cell with air (see Fig. 2) while in the cell, I make the upper end of the central shaft F hollow to take air from inside the boat, and in the hollow shaft within the cell I form an opening g, which is surrounded by a swiveling collar h, having an annular channel and a thimble i, connecting with a hose m and double mouthpiece n for the use of the person or persons within the cell. This swiveling collar prevents the twisting or winding up of the hose while the cell is being turned. This air-supply is to provide for a protracted stay in the cell in case anything goes wrong with the door-actuating devices. If the cell be used for diving purposes, the upper end of the hollow shaft is connected by a hose f with an air-pump.

When the person or persons enter the cell from the interior of the boat and the cell has been turned to shut off communication with the interior of the boat, the cell is for a short time completely closed from both the interior and exterior of the boat. After a half-revolution takes place the water rushes into the cell and submerges the occupant for a brief period. To render this inrush of water gradual and to break its force, a small notch or hole l, Fig. 2, is located near the bottom of the cell-door, so as to open first a small inlet, so that the water rises gradually in the cell, and when the cell is filled the cell is then turned its full movement, so that the occupant or occupants can escape through its door into the exterior water and rise to the surface. After an occupant or occupants of the cell have escaped water will show through hollow shaft and come into the boat. Then the persons inside the boat turn the cell back again to receive another person or persons by means of the external crank-handle.

When the invention is used for a bulkhead-door or is placed in a partition, provision must be made for rotating the cell from either side, and for this purpose the bevel-gear and its operating-crank (shown on the right of Fig. 2 at the bottom of the cell) are duplicated on the left, as indicated by dotted lines.

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

1. A rotary cell-shaped door having an opening in its side, combined with an inclosing case made in two hinged sections said sections each having an opening arranged opposite each other and means for tightening and holding the hinged sections upon the cell-door substantially as described.

2. A rotary cell-shaped door having an open-

ing in its side, combined with an inclosing case made in two hinged sections, said sections each having an opening arranged opposite each other, means for tightening and holding the hinged sections upon the cell-door and means for adjusting the axial bearings of the cell outwardly substantially as described.

3. A rotary cell-shaped door having axial bearings and an opening in its side, combined with an inclosing case having opposite openings and means for adjusting the cell laterally to its axis to a tight fit with the opening in the case as described.

4. A rotary cell-shaped door for a boat having an opening in its side, combined with an inclosing case having opposite openings, bearings for the axis of the cell and means for adjusting both bearings outwardly in relation to the boat substantially as described.

5. A rotary cell-shaped door for a boat having an opening in its side, combined with an inclosing case having opposite openings, means for turning the cell within the case and a central air-supplying pipe entering the cell concentrically with its axis substantially as described.

6. A rotary cell-shaped door of cylindrical form having an opening in its side, an inclosing cylindrical case with opposite openings, a loose central shaft having a gear-wheel on its upper end outside the cell, an intermediate gear meshing therewith and mounted exteriorly on the top of the cell, a stationary annular gear with inwardly-projecting teeth meshing with the said intermediate gear and means for rotating the shaft from both the interior and exterior of the cell as described.

7. A rotary cell-shaped door of cylindrical form having an opening in its side, an inclosing cylindrical case having opposite openings, a loose central shaft having one rigid gear-wheel on its upper end outside the cell and another rigid gear-wheel on the lower end below and outside the cell, a turning shaft arranged below the cell and extending through the side of the case and bearing on its inner end a gear meshing with the gear on the lower end of the shaft, a second turning shaft arranged within the cell, and gears connecting the same with the central shaft within the cell substantially as described.

8. A rotary cell-shaped door having an opening in its side, an inclosing case with opposite openings, a hollow central operating-shaft extending through the end of the cell for connection with an air-supply and a mouthpiece with air-pipe within the cell having a swiveled connection and open communication with the interior of the hollow shaft substantially as shown and described.

DAVID WALDHAUER STIBBS.

Witnesses:
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C. S. CARTER.