

R. G. DUNBAR.

Improvement in Reversible Hydraulic Propellers.

No. 132,262.

Patented Oct. 15, 1872.

Fig. 1.

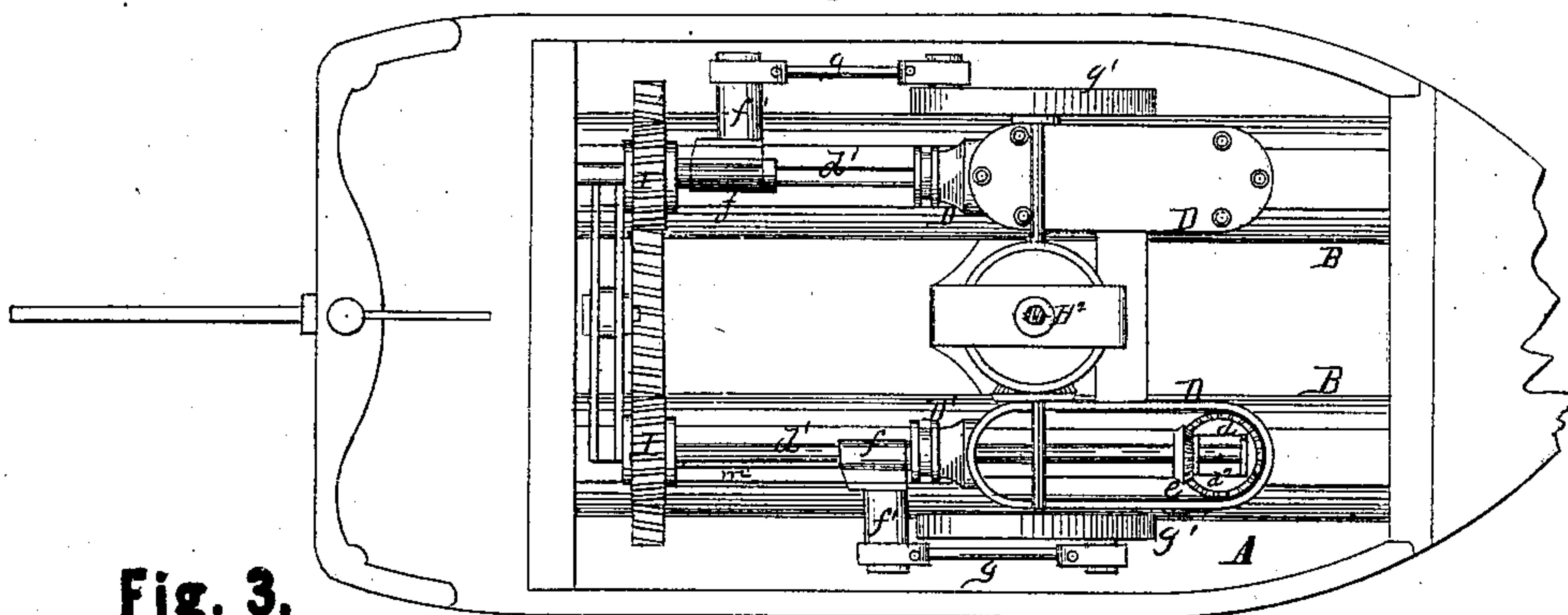


Fig. 3.

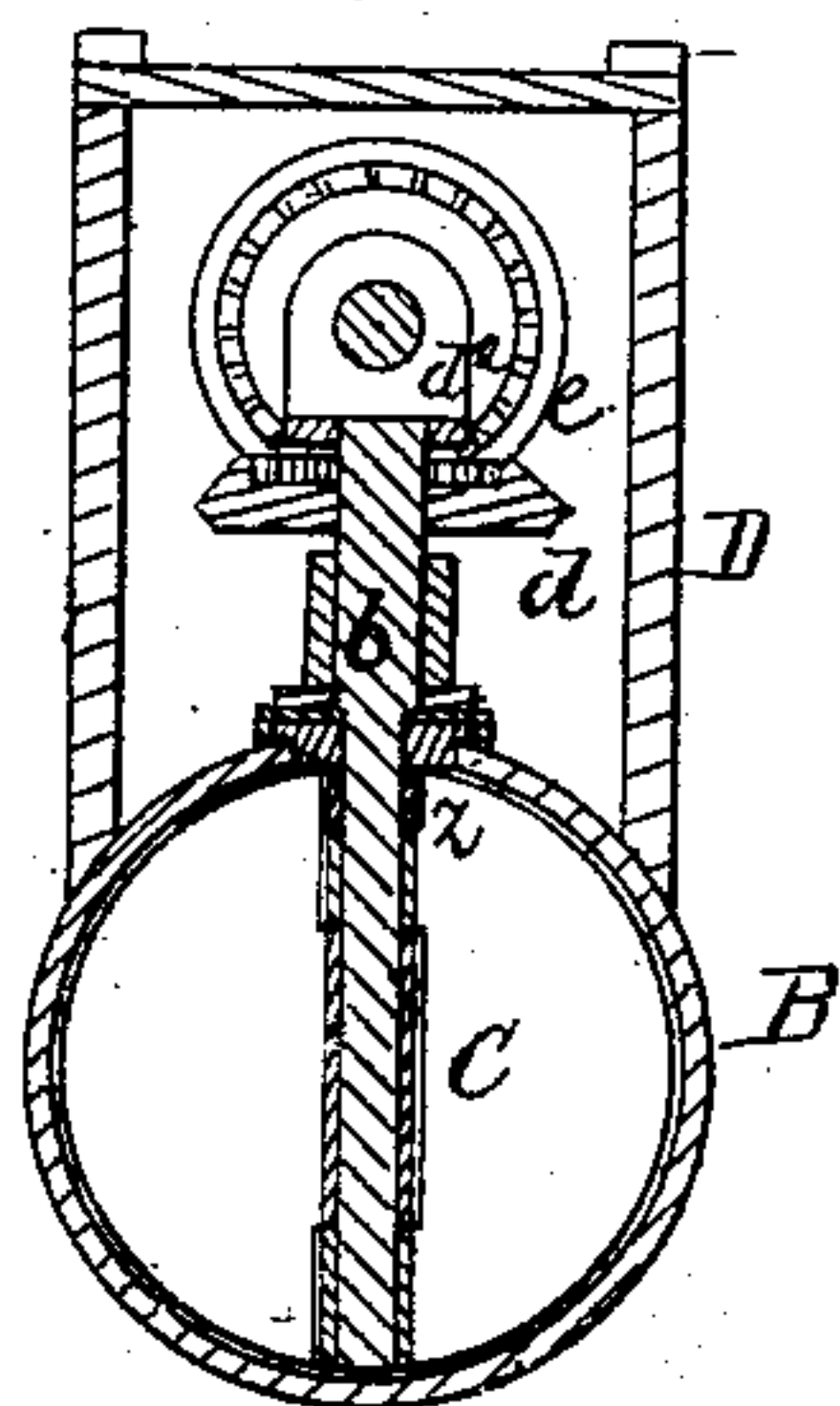


Fig. 2.

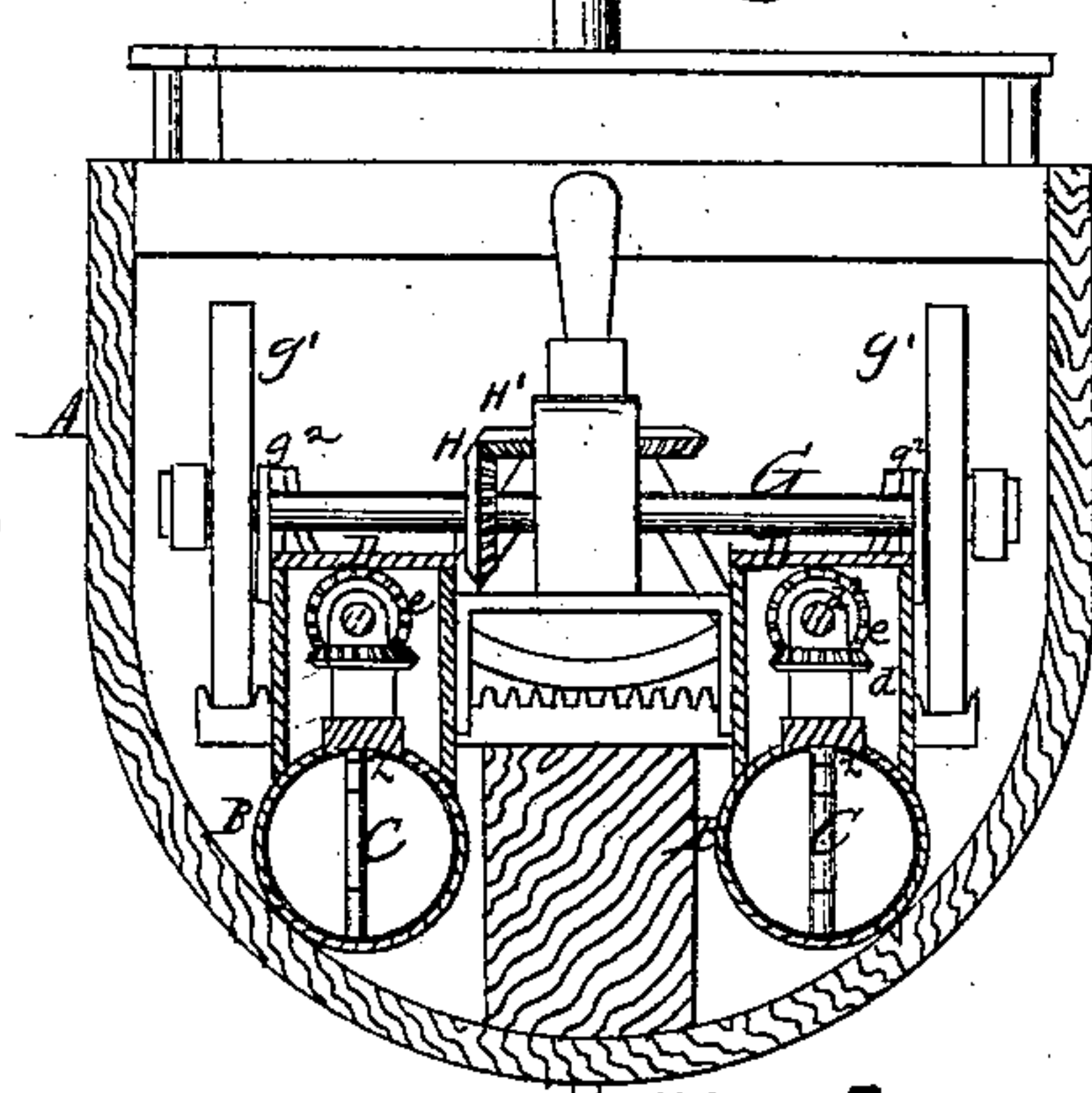


Fig. 4.

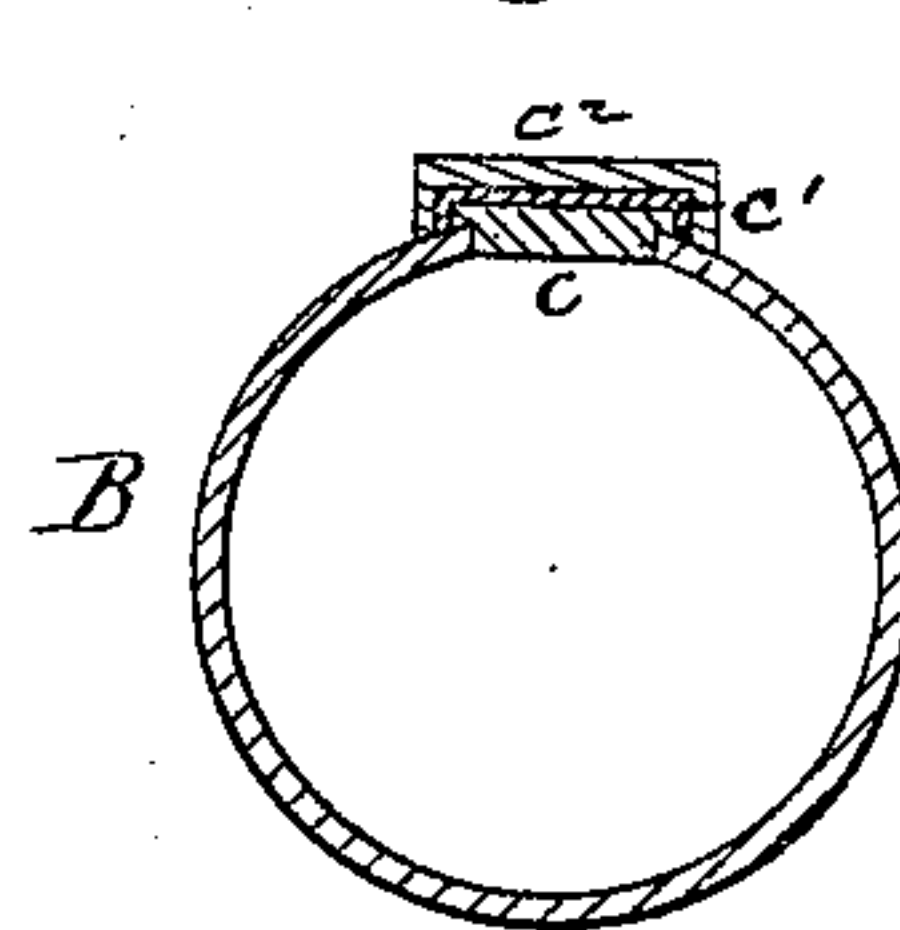


Fig. 5.

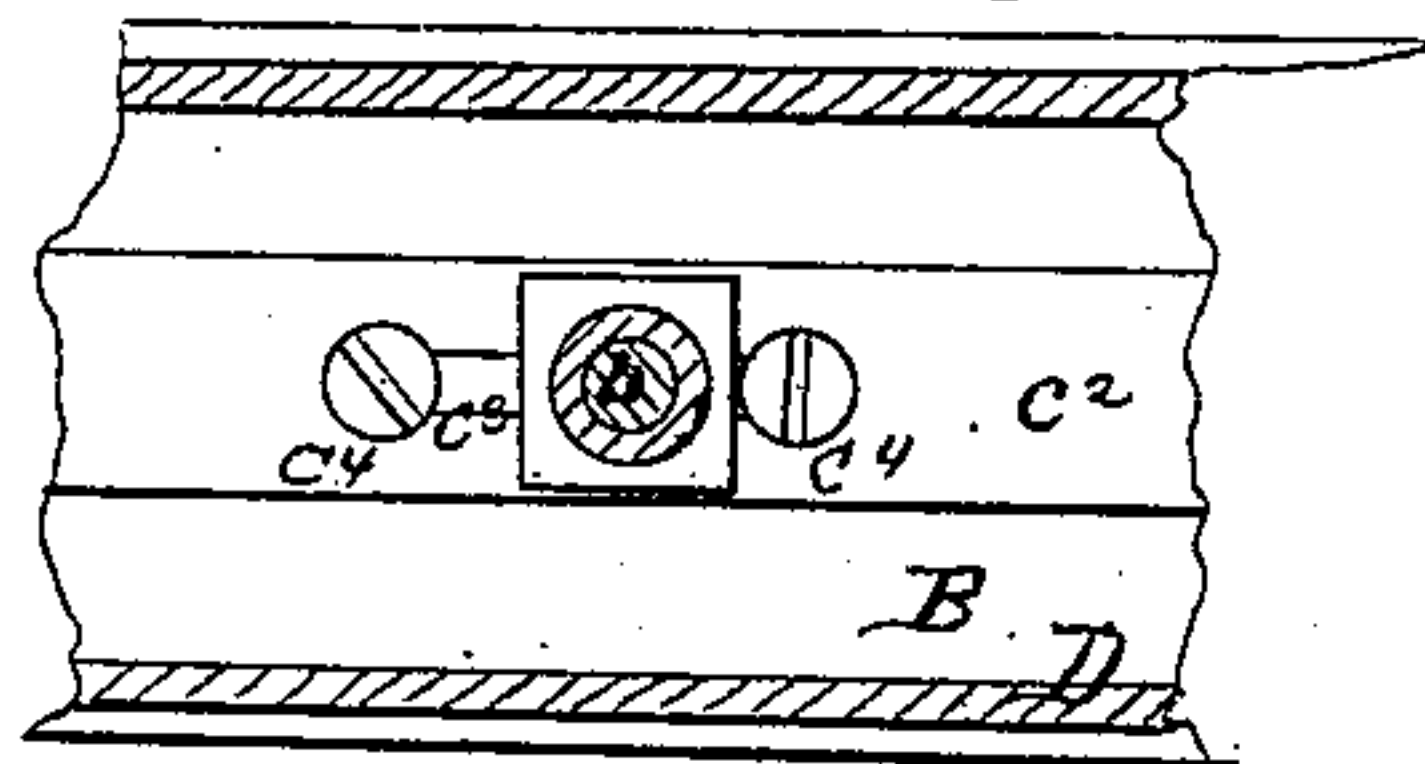
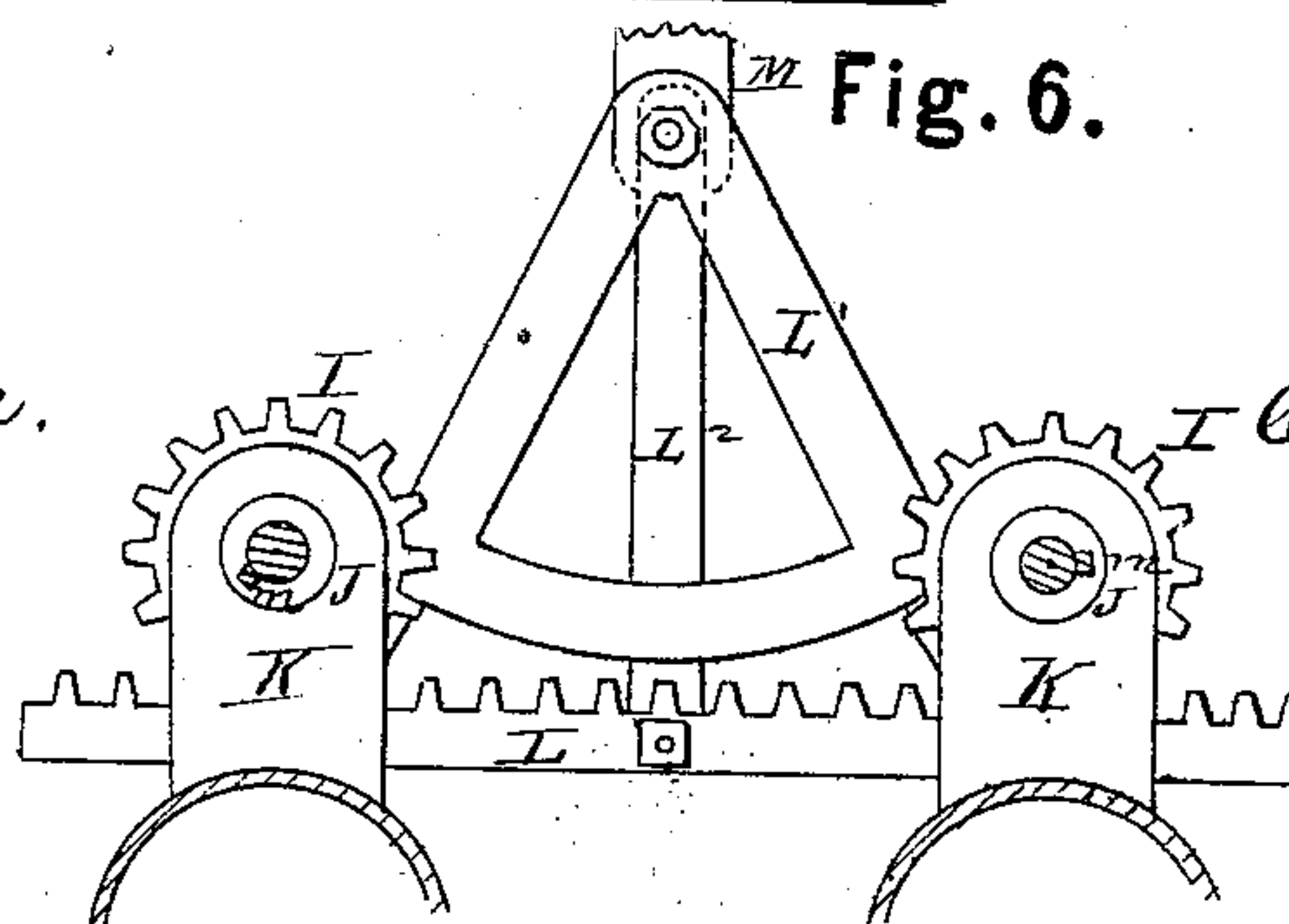


Fig. 6.



WITNESSES.

Geo. E. Upham.
Jos. B. Loomis.

INVENTOR.

R. G. Dunbar
Chipman & Son, attys.

UNITED STATES PATENT OFFICE.

RANSOM G. DUNBAR, OF LOGANSFORT, INDIANA, ASSIGNOR OF ONE-HALF HIS RIGHT TO ROBERT J. CONNOLLY, OF SAME PLACE.

IMPROVEMENT IN REVERSIBLE HYDRAULIC PROPELLERS.

Specification forming part of Letters Patent No. 132,262, dated October 15, 1872.

To all whom it may concern:

Be it known that I, RANSOM G. DUNBAR, of Logansport, in the county of Cass and State of Indiana, have invented a new and valuable Improvement in Devices for Propelling Marine Vessels; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a plan view of my invention; Fig. 2 is a sectional view of the same; Figs. 3, 4, 5, and 6, are detail views of the same.

My invention has relation to certain improvements in that class of boats which are propelled through the agency of reciprocating valves arranged within tubes which receive water at one end and expel it from the other; and it consists in the construction and novel arrangement of devices connecting said valves with their motors, and of devices whereby the valves may be turned within the tubes so as to cause the boat to move forward or backward at will, all as hereinafter more specifically described.

Referring to the accompanying drawing, A designates the hull of a boat, in the bottom part of which are located the horizontal tubes B, extending from bow to stern on either side of the keelson and open at both ends. C C designate fly-valves, located within the tubes B. Each valve consists of two semi-circular plates hinged to a central vertical rod, *b*, which passes through a slot in the tube and holds on its upper end a beveled pinion-wheel, *d*, engaging with a similar wheel, *e*, on the end of a horizontal shaft, *d*¹. A bent plate, *d*², rests on the top of the rod *b*, and holds the projecting end of the shaft *d*¹, thereby connecting the rod and shaft together. D D indicate boxes arranged upon the tubes B B and containing the pinions *d e*. The shafts *d*¹ play back and forth through stuffing-boxes D' attached to the ends of the boxes D D, and, through the medium of the plates *d*² and rods *b* transmit horizontal reciprocating motion to the valves C C. Each of said shafts is provided with a collar, *f*, having an arm, *f'* *f'*, to which is connected a pitman, *g*, coupling said

arm to a crank-wheel, *g*¹. G designates a transverse shaft connecting the wheels *g*¹, and having its bearings in standards *g*² rising from the boxes D D. The shafts *d*¹ and their operating devices are so arranged that the valves shall have an alternating movement—the one moving forward while the other moves back, and vice versa. H designates a beveled pinion on the shaft G engaging with a beveled spur-wheel, H¹, on a vertical driving-shaft, H². The shaft G may, however, be driven by any convenient or suitable means. I I designate toothed pinions, having collars J J and supported between and by standards K K rising from the tubes B B and located at a convenient distance from the boxes D D. These pinions rest upon and engage with a horizontal transverse rack, L, which slides between plates or frames L¹, and has pivoted to its middle part or lever L², also pivoted to the top of the frames L¹. A forked handle, M, is fitted to the top of said lever and used as a means of operating the rack and turning the pinions I I simultaneously. To increase the meshing-surfaces of the rack and pinions the teeth may be cut obliquely, as shown. Each of the shafts *d*¹ has a feather, *m*, and passes through the center of one of the wheels I I. Said shafts slide through these pinions, but are prevented from turning by the feathers *m*, except when the pinions are turned. The turning of said shafts through the medium of the pinions serves to turn the valves C C. The valves C C are so constructed and arranged that, as they move in the direction in which the boat is moving their wings will fall back and allow them to pass through the water easily. But as soon as the motion of the valves is reversed the wings spread out, and being prevented from turning forward lengthwise of the tubes by stops *z z*, lie crosswise and act against the water as paddles, thereby propelling the boat in a contrary direction from that in which they are moving. The direction of the movement of the boat is controlled by means of the devices for turning or reversing the valves. To prevent the water in the tubes from entering the boat the following-described expedient is adopted: The rods or shafts *b* pass through and are secured to bars *c*, which slide through slots cut in the upper parts of the tubes. These

bars have side flanges which project over the edges of said slots. The bars *c* are secured to plates *c*¹, having side flanges which embrace the flanges of the bars *c*. The plates *c*¹ slide through the boxes D and through long narrow boxes *c*² arranged upon the tubes outside the boxes D. By this arrangement all leakage is prevented. The shafts *b* pass through slots *c*³ in the plate *c*¹—the bars *c* being secured to said plates by screws *c*⁴ passing through said slots. The shafts *b* and valves C are thus adjustable lengthwise of the tubes.

What I claim as new is—

1. The rack L, pinions I I, feathered recip-

rocating shafts *d*¹, gearing *d e*, and shaft *b*, in combination with the reversible-hinged fly-valves C and tubes B, substantially as specified.

2. The plates *c c*¹, boxes *c*², shafts *b*, reciprocating valves C, and tubes B, combined substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

RANSOM G. DUNBAR.

Witnesses:

JOHN C. NELSON,

DUDLEY H. CHASE.