(No Model.)

J. M. GLENN.

PNEUMATIC APPARATUS FOR PROPELLING VESSELS.

No. 436,350. Patented Sept. 16, 1890.

Fig. 1.

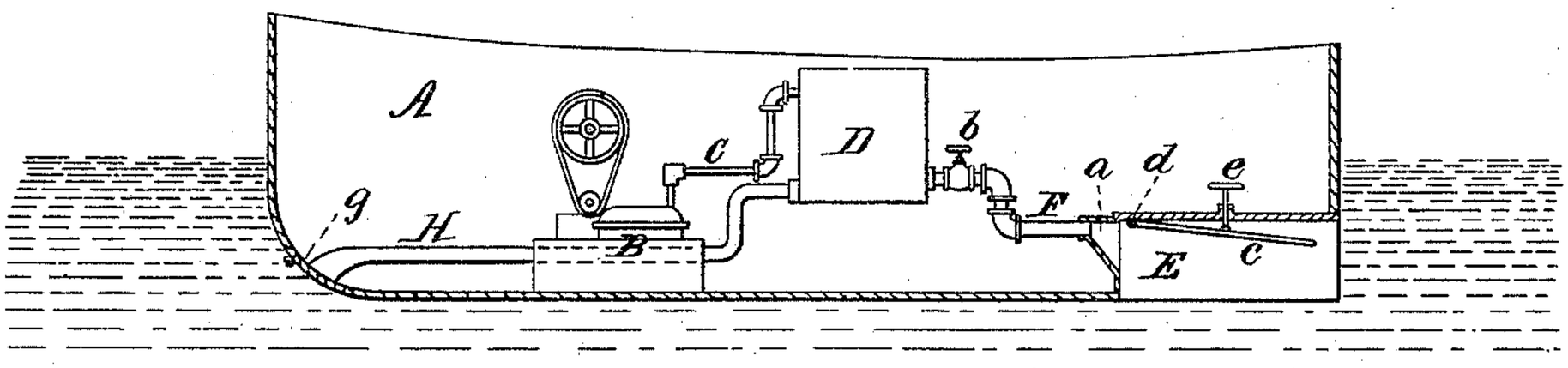


Fig. 2.

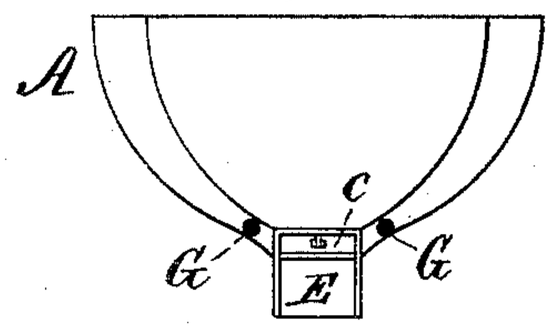
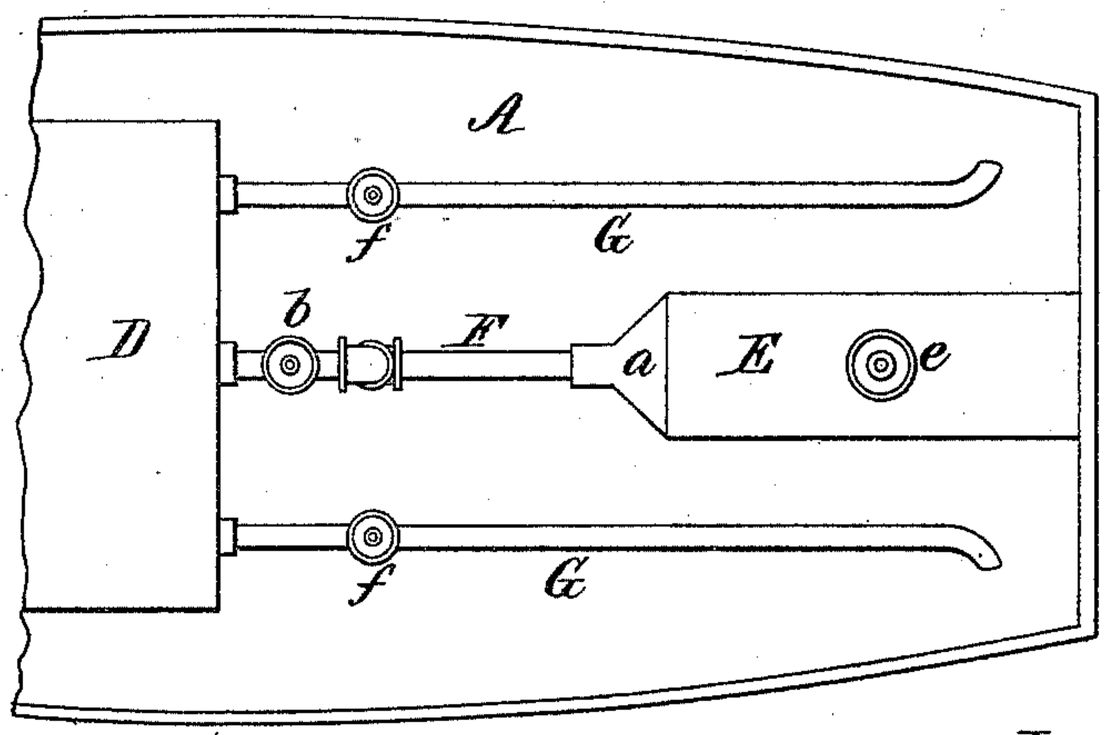


Fig. 3.



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UNITED STATES PATENT OFFICE.

JAMES M. GLENN, OF CINCINNATI, OHIO.

PNEUMATIC APPARATUS FOR PROPELLING VESSELS.

SPECIFICATION forming part of Letters Patent No. 436,350, dated September 16, 1890.

Application filed July 3, 1889. Serial No. 316,462. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. GLENN, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Pneumatic Apparatus for the Propulsion of Vessels, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to all classes of vessels, and has for its object the provision of novel means for propelling and steering the same.

The novelty of my invention will be herein set forth, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal section of a boat fitted out with my improved apparatus. Fig. 2 is a rear elevation of the same. Fig. 3 is an enlarged plan of the rear half of the same.

The same letters of reference are used to indicate identical parts in all the figures.

A is a boat of any suitable construction, having fitted within it an air-pump or pressure-blower B, driven by any suitable power and communicating by a pipe C with an air-chamber D. At the rear of the boat on its under side is a chamber E, open at the bottom and rear end and so constructed as to be always submerged and preferably rectangular in cross-section. A pipe F extends from the chamber D and opens with a flaring mouth *a* into the forward end of the chamber E. Any suitable valve *b* is provided for the pipe F to control the admission of air from the chamber D into the chamber E, and the pressure of the air from the pipe F against the water in the chamber E propels the boat. The chamber E is provided with an adjustable hinged deflecting-board *c*, hinged as at *d* and adjusted by the screw *e* to prevent the escape of the air along the top of the chamber and to thereby secure its best results in propelling the boat.

G G, Fig. 3, are two pipes extending back from the chamber D to the stern of the vessel beneath the water-line on each side, and are slightly curved outward, as shown. These pipes are likewise provided with suitable valves *f*, and their purpose is to steer the vessel by the pressure of the air through them against the water, as will be readily understood.

For checking and backing the vessel, its forward end may be fitted up in the same manner as its rear end, the propelling and steering pipes all extending from the same chamber D.

The forwardly-extending pipe H is provided with a hinged cover or valve *g*, which as the vessel is propelled forward is held closed by the pressure of the water, but which is opened to permit the backing of the vessel by the pressure of the air through the pipe H.

By providing the enlarged chamber E at the rear end of the vessel, into which the air-pipe of lesser diameter enters, a greater space for the expansion of air is provided, and such expansion is forced to be made in a course directly backward. Furthermore, such chamber enables the introduction of the adjustable deflecting-board.

Having thus fully described my invention, I claim—

1. In pneumatic propelling apparatus for vessels, the combination, with the vessel, of an air-pump or blower, a chamber receiving the air from said pump or blower, and a downwardly and rearwardly open discharging-chamber formed in the bottom of the vessel at its rear end, and a pipe of less diameter than the said discharging-chamber connecting it with the first-mentioned chamber, substantially as and for the purpose described.

2. In pneumatic propelling apparatus for vessels, the combination, with a vessel, of an air-pump or blower, a chamber receiving the air from said pump or blower, and a downwardly and rearwardly open discharging-chamber formed in the bottom of the vessel at its rear end, and a pipe of less diameter than the said discharging-chamber connecting it with the first-mentioned chamber, said last-mentioned discharging-chamber being provided with an adjustable deflector, substantially as and for the purpose described.

3. In pneumatic propelling apparatus for vessels, the combination, with the vessel, of an air-pump or blower, a chamber receiving the air from said pump or blower, a down-

wardly and rearwardly open discharging-chamber formed in the bottom of the vessel at its rear end, and a pipe of less diameter than the said discharging-chamber connecting it with the first-mentioned chamber, and pipes controlled by valves leading from said first-mentioned air-chamber to the rear of the vessel below the water-line, substantially as and for the purpose described.

4. The pneumatic propelling apparatus for vessels, consisting of the combination of the air-pump B, chamber D, connecting-pipe C, chamber E, formed in the bottom of the vessel at its rear end, pipe F, of less diameter than said chamber E, connecting it with the chamber D, pipes H, leading from chamber D to openings at the bow of the vessel, and the two steering-pipes G, leading from chamber D to the stern of the vessel, one on each side of chamber E, substantially as described.

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