(No Model.)

A. L. SEGOND.

PROPELLING VESSELS BY CENTRIFUGAL FORCE.

No. 303,329. Patented Aug. 12, 1884.

FIG. 1.

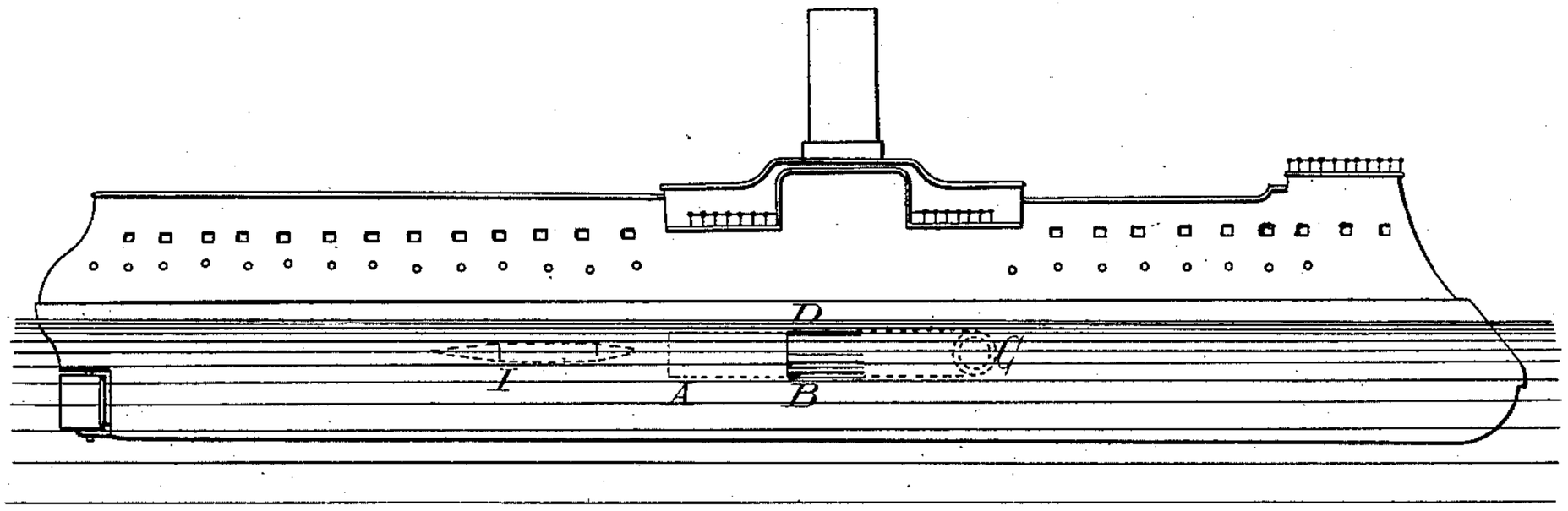


FIG. 2.

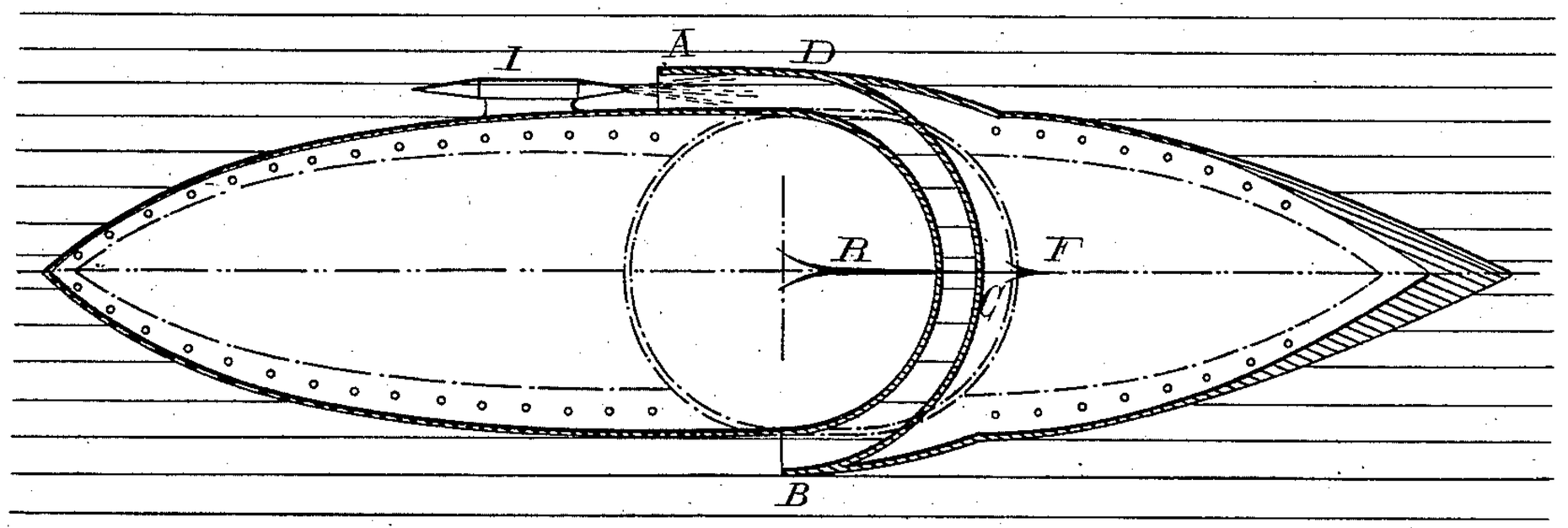
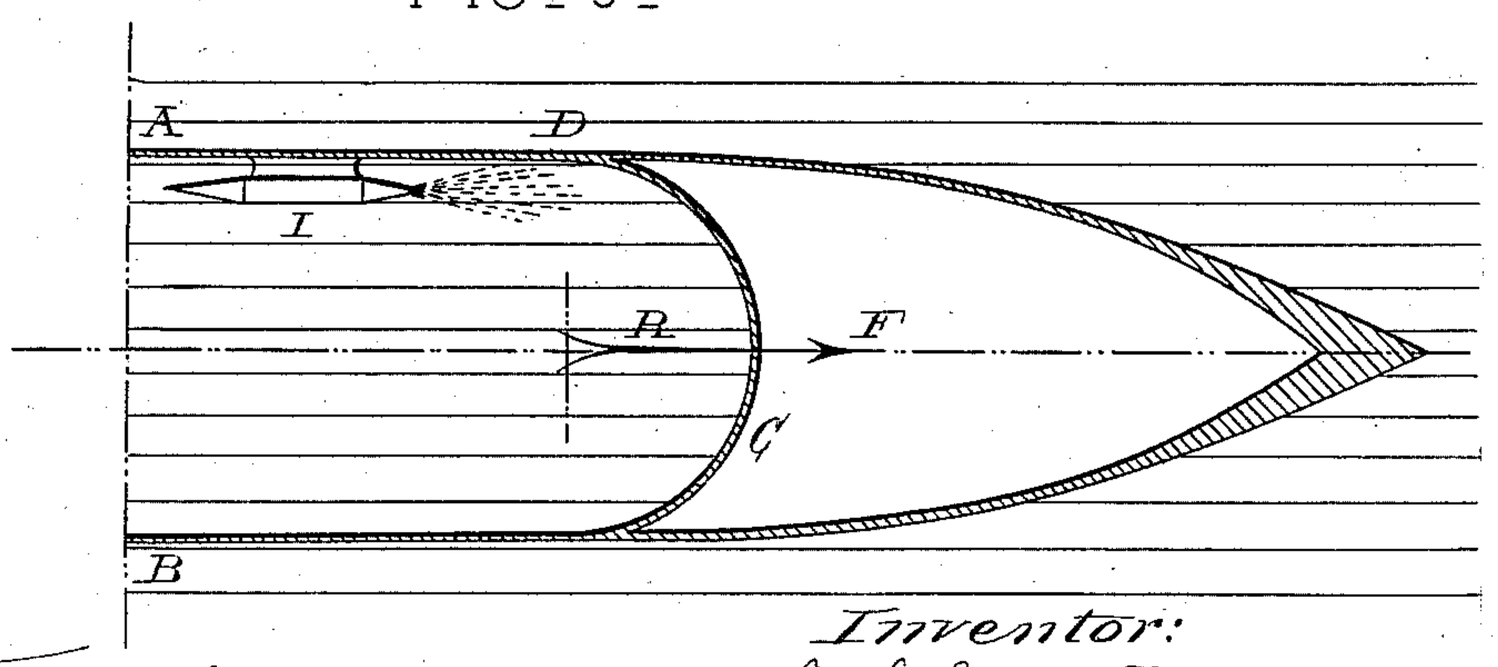


FIG. 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

ALFRED LÉON SEGOND, OF PARIS, FRANCE.

PROPELLING VESSELS BY CENTRIFUGAL FORCE.

SPECIFICATION forming part of Letters Patent No. 303,329, dated August 12, 1884.

Application filed September 19, 1883. (No model.) Patented in France May 11, 1883, No. 155,418.

To all whom it may concern:

Be it known that I, ALFRED LÉON SEGOND, a citizen of France, residing at Paris, in the French Republic, have invented new and useful Improvements in Propelling Vessels by Centrifugal Force, (for which I have obtained patent in France dated May 11, 1883, No. 155,418,) of which the following is a specification.

The centrifugal propeller the subject of the present invention is intended for propelling vessels by the action of a mass of water which is forced to describe a circle.

The apparatus may be of any convenient form and dimensions. As example, I will here describe two specimens, with the modifications which they may bear without departing from the principle of action.

The propeller represented in elevation Figure 1 and plan section Fig. 2 by the accompanying drawings consists, essentially, of a tube, A B, the larger portion of which is bent in an arched form, and of an injector of the Giffard or other type, inclosed in a case, I. The two ends of the tube A B are open, so that the water may pass freely through it, and the ends are below the line of flotation, so that they are immersed. The water, which should, by its motion, produce the centrifugal force, traverses the tube in a current running from A to B. The injector I sets the water in motion, and being thrown from rear to front, first runs through the straight part of the pipe A D, which portion merely serves to regulate the working of the apparatus. On reaching the bent part of the pipe, the water encounters the side C, which opposes its advance in a direct line and compels it to describe a circle. The centrifugal force having a tendency to throw the water from the center on which it turns, the water is pressed against the side C of the pipe, and, pushing against it, consequently propels the vessel to which the pipe is fixed. The direction of the force developed by the curvilinear motion of the water is represented by the line R F. The case I incloses a steam-injector of the Giffard or other description. It also contains the pipes which conduct the steam, as well as the mechanism necessary to regulate the working of the injector. This case is intended to prevent condensation of the steam, which should reach the orifice of the injector dry. By giving it a suitable form, the loss of power may be diminished by the displacement of the water that this part of the apparatus occasions. Centrifugal force is not the sole power which influences the propulson of the vessel. The impelling forces must also be taken into account, and in addition the forces arising from the pressure that the water brings to bear on the part of the apparatus which is outside the vessel. Account should also be taken of the reaction of the injector. This force is directed in an opposite direction to the centrifugal force, for were it equal to it, its power would be reduced. It is *nil*. Centrifugal force deprives it of a good deal of the power which would tend to hinder the progress of the vessel.

The arrangement shown in Fig. 3 is based on the same principle. It consists, essentially, of a tube with straight sides, and arched at A B, and of the steam-injector inclosed in the case I. This apparatus is fixed to the sides of the vessel and immersed. The water is thrown in the form of a jet, from rear to front, by the injector. It encounters the side C, which hinders its course in a direct line, and compels it to describe a circle. The centrifugal force developed by the curvilinear motion of the water tends to hurl the water from the center on which it turns. The water presses against the side, which it pushes, and so impels the vessel to which the pipe is connected. It will be seen that the results of this arrangement are identical, the only difference being that the stream set in motion by the injector is not surrounded by a solid pipe. The resultant forces of the water are the same.

The advantages gained by the use of this apparatus are not due to the steam-injector entirely. The *vis viva* of the Giffard apparatus is considerable. For an equal expenditure of steam the injector supplies only two-fifths of the force produced by an ordinary engine. The effective force of my propeller is such that the *vis viva* of the injector is almost wholly utilized, while the available force supplied by the engine is transformed into working-power by means of the screw or paddle wheel, with a loss of eighty per cent. The transformation of the *vis viva* of the injector into available working-

power does not occasion a loss of more than two per cent. This loss is due almost entirely to the friction of the water on the sides of the tube and case of the injector. As example, the water passing through my apparatus for producing centrifugal force is not thrown outside the vessel until the *vis viva* communicated by the injector has been transformed into working-power. When the working of the apparatus is well regulated, the speed of the water leaving the end of the tube is *nil*. It is the vessel in its advance that leaves the water behind it, which is quite still.

It has been previously observed that the propeller may be of various forms. As explained, the tube A B may be discarded, and a simple side used instead. In apparatus where the tube is employed it may be of various shapes. The arc described by the water is undetermined, since every curvilinear motion produces centrifugal force. This simple fact would indefinitely vary the shape of the propeller. When the propeller is of sufficient dimensions to admit of so doing, the injector described may be replaced by others of a smaller pattern. By this means a more regular movement of the water is procured in the tube A B. Finally, the steam-injector may be replaced by a water-injector, producing nearly the same results. In an apparatus of this description the water, forced by some convenient method, spirts into the orifice and produces a result analogous to that of the steam-jet.

The centrifugal propeller may be placed in any part of the vessel, the only indispensable condition being that at least one of the ends of the tube should be immersed, so as to allow the injector to act.

The apparatus may be placed horizontally, vertically, or obliquely without any inconvenience.

I claim as my invention—

In a vessel, the combination of the injector I, which is under water, with the curved pipe A B, which extends across the vessel and has open ends at its rear, and which is adapted to receive the action of the injector, said injector being placed immediately behind one open end of said pipe, substantially as herein shown and described.

ALFRED LÉON SEGOND.

Witnesses:

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