No. 825,881. PATENTED JULY 10, 1906.

T. GIBON.

AUTOMATIC SYSTEM FOR BALANCING AND CONTROLLING TORPEDOES.

APPLICATION FILED NOV. 11, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

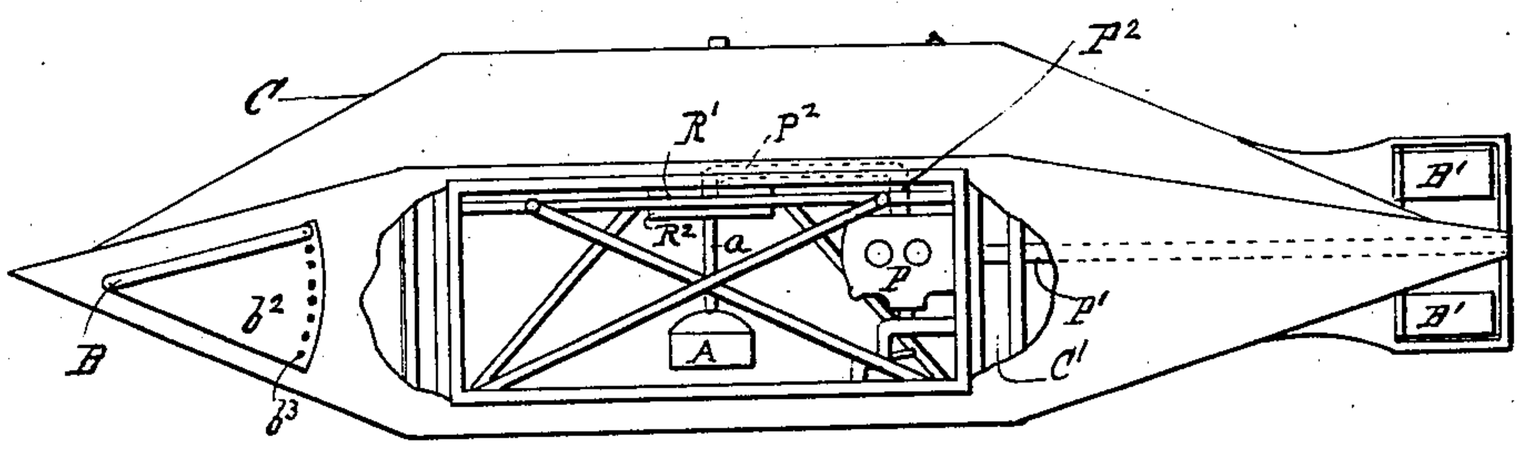


Fig. 2.

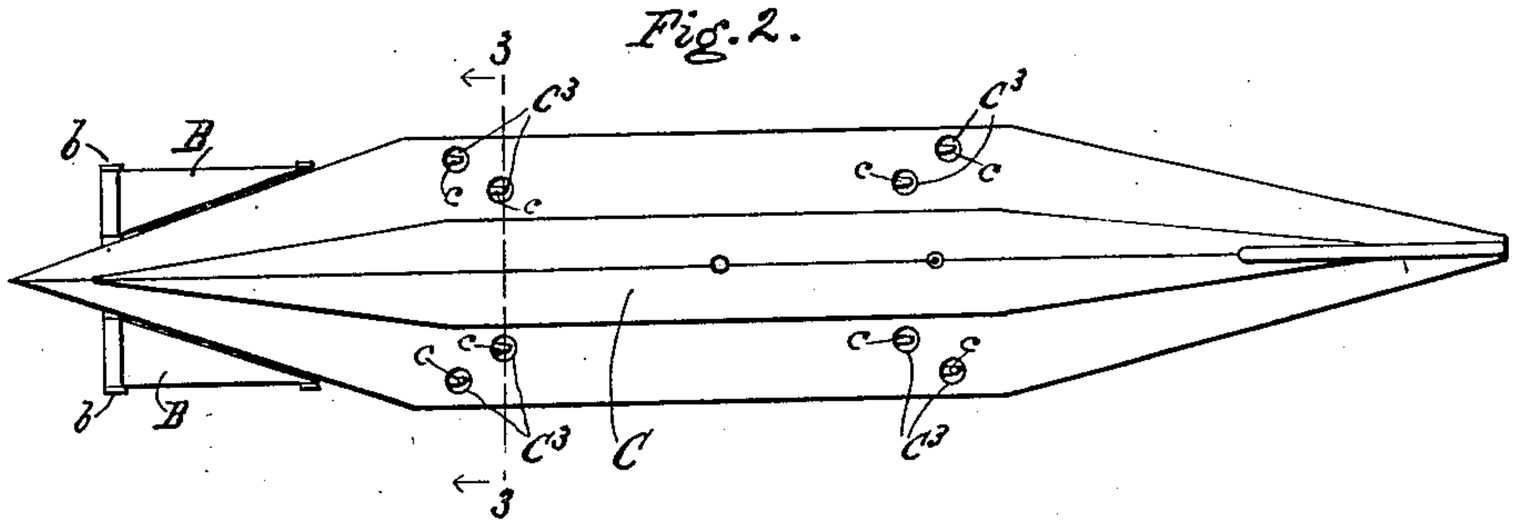
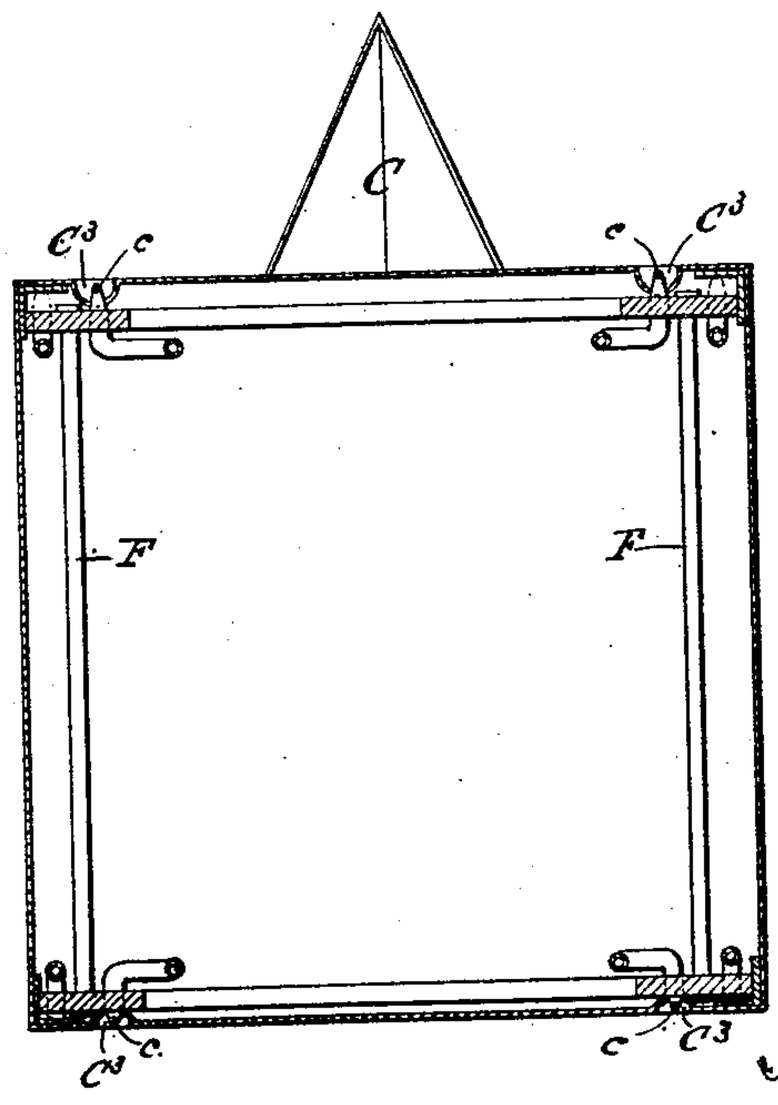


Fig. 3.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 4.

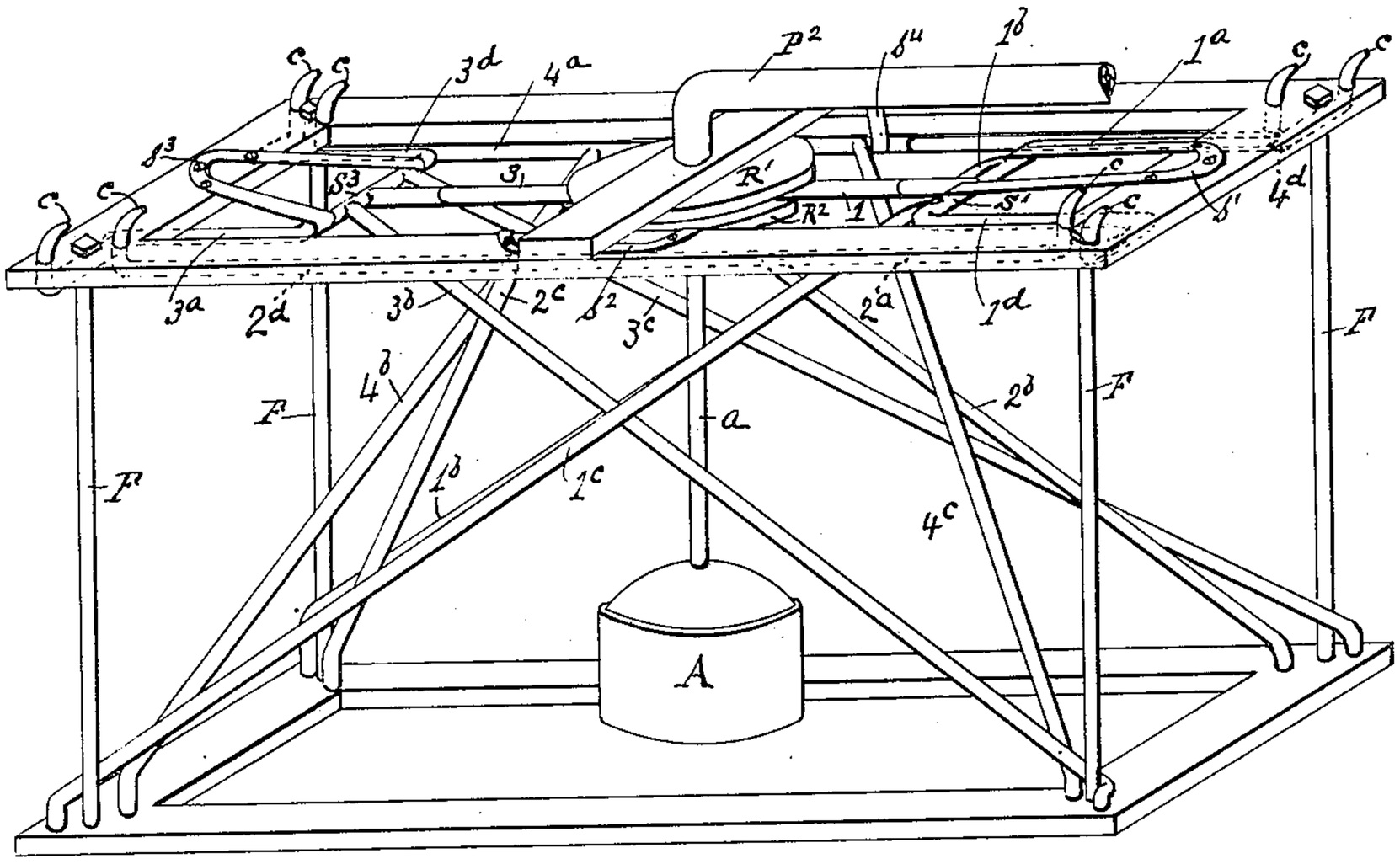
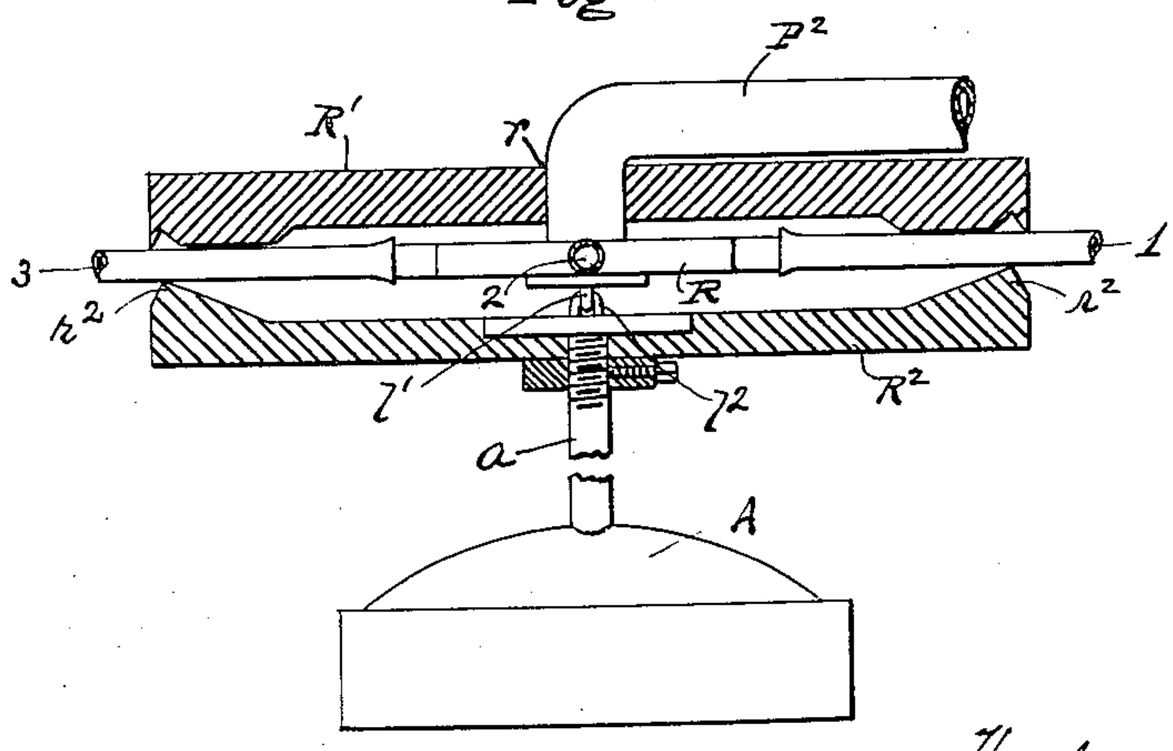


Fig. 5.



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THEODOR GIBON, OF CLARKSVILLE, TENNESSEE.

AUTOMATIC SYSTEM FOR BALANCING AND CONTROLLING TORPEDOES.

No. 825,881. Specification of Letters Patent. Patented July 10, 1906.

Application filed November 11, 1905. Serial No. 286,943.

To all whom it may concern:

Be it known that I, THEODOR GIBON, a subject of the German Emperor, and a resident of Clarksville, Montgomery county, in the State of Tennessee, have invented certain new and useful Improvements in Automatic Systems for Balancing and Controlling Torpedoes and the Like, of which the following is a specification.

My invention relates to certain improvements especially applicable in balancing and controlling submarine torpedoes, although with slight modifications the same principle may be applied to submarine boats or aeroplanes.

The principal object of my invention is to provide a construction whereby the torpedo or the like will be propelled and at the same time balanced in a horizontal plane and means whereby it may be controlled to sink to any desired depth in going a known distance.

In the accompanying drawings, which show my system applied to a submarine torpedo, Figure 1 represents a form of torpedo in elevation with parts broken away. Fig. 2 is a plan view of the torpedo. Fig. 3 is a sectional view taken on the line 3 3, Fig. 2. Fig. 4 is a detail perspective view showing the balancing mechanism; and Fig. 5 is a detail of part of Fig. 4, showing the distributing-valve.

In the drawings, I have shown my invention as applied to a submarine torpedo of square cross-section instead of the usual cigar shape. As is customary, the torpedo is divided into three distinct parts, the forward end containing the explosive charge, the central part the propelling means, and the rear part, which in this case contains a compressed-air tank. Extending along the top of the torpedo is a fin-shaped buoyancy-chamber C to sustain the weight of the torpedo and maintain the same at a constant depth, preferably with the body several inches below the surface of the water in order that the propelling medium may exert its reactive force in the water above.

The propelling means may be of the usual type of screw-propeller operated by a compressed-air engine; but it is preferred, as shown in Fig. 1, to use a pump P of any simple but powerful form, operated by compressed air or other means from the chamber C′. The pump P draws water in the rear end of the torpedo through the pipe P′ and discharges it through the pipe P^2 to the balancing and propelling mechanism.

The balancing mechanism of the form shown consists of two open rectangular frames connected at the corners by rods F, forming a framework, as shown in Fig. 4. Mounted in the center of the upper rectangle is the distributing-valve, which controls the balancing mechanism and which I will now describe. The pipe P^2, leading from the pump, enters at *r* the top of the stationary ring R′ to the distributing-ring R, which is at the center of gravity of the torpedo and is divided into four branches 1, 2, 3, and 4 in the form of flexible tubes, which pass out between the rings R′ and R^2. The upper ring R′ is in this form rigid with the framework of the torpedo. The ring R^2, the center of which should be directly beneath the entrance-pipe P^2, is concentric with the ring R′ and is fixed to the upper end of the stem *a* of the pendulum A, lying in a plane perpendicular thereto. The pendulum A is supported by a universal joint, such as two links *l′* and l^2, attached to the ring R and the stem *a* of the pendulum, respectively. It will now be seen that as the torpedo tilts to either side or "pitches" the pendulum will swing accordingly, and the raised portion r^2 of the ring R^2 will squeeze the flexible pipe at that point against the outer edge of the ring R′, and so stop the water from that branch. This will naturally increase the current in the other three branches.

Referring to Fig. 4, it will be seen that each of the branch pipes 1, 2, 3, and 4 passes through a spreader S′ S^2, &c., supported from the frame by the rods *s′* s^2 s^3, &c., or other means, and each is divided into four streams 1^a 1^b 1^c 1^d 2^a, &c. Two of these pipes 1^a and 1^d lead to the nearest upper corners of the frame and the other two, 1^b and 1^c, to the diametrically opposite lower corners. There will therefore be two pipes leading to each corner. When this mechanism is in position on the torpedo, a short pipe or nozzle *c* leads to a discharge-outlet C^3 on the exterior upper or lower side of the torpedo, as the case may be. In each outlet C^3 the nozzle *c* is below the exterior surface of the torpedo. Each one of these nozzles points backward at an angle of about forty-five degrees. The upper eight streams are parallel with each other, and the lower eight streams are also parallel

with each other. It is the reactive force of these sixteen streams that propels the torpedo. As long as the torpedo remains in a horizontal position all of these streams will operate; but if any force acts to throw it out of a horizontal plane or causes it to tilt to one side the pendulum will swing to cut off the branch pipe at that side, which, it will be seen by referring to Fig. 4, will, for example, squeeze the pipe 1 and shut off two of the upper holes 1^a 1^d on that side and two of the lower holes 1^b 1^c on the opposite side. This will of course increase the pressure in the other streams, and as the corresponding streams, or those of the opposite spreader S^3, are still in operation the force of these additional streams will tend to restore the torpedo to its desired position. The pendulum will then swing back to the normal position, which immediately opens the valve or pipe 1 at that side which was closed. The same operation will hold for "pitching" or a combination of pitching and rolling, in which latter case two branch pipes will be closed instead of one. On the front end of the torpedo are two rudders B, one on each side, pivoted at b to a triangular plate b^2. At the opposite end of this plate, arranged in the arc of a circle, are a series of holes b^3, adapted to be engaged by a pin on the rudder, whereby the depth to which the torpedo is to sink may be arranged for. This can be predetermined by experiment. For example, when the pin is in the third hole from the top the torpedo will sink five feet in every thousand feet traversed. At the opposite end may be placed two rudders B′ in a plane at right angles to those in the bow for the purpose of keeping the torpedo in a straight course or to travel in a constant curve. If preferred, both sets of rudders may be placed in the stern, as is customary in the art. This same valve principle may be applied to mechanism for operating aeroplanes, such as described in my Patent No. 730,107.

I claim as my invention—

1. In torpedoes or the like, a propelling and balancing means comprising a pump, a distributing-valve, flexible pipes leading therefrom and means for closing one or more of said pipes when the torpedo is out of equilibrium.

2. In torpedoes and the like, a propelling means comprising a pump, an automatic distributing-valve, nozzles on the exterior surface of the torpedo and inclined at an angle thereto, and connections between said distributing-valve and nozzles through which the propelling medium is forced in combination with means connected with said valve for closing one or more of the said connections to restore the torpedo to equilibrium.

3. In torpedoes and the like, balancing means, comprising a distributing-valve, flexible pipes therein, means connecting said pipes with the exterior of the torpedo, said distributing-valve adapted to act on said pipes to restore the torpedo to equilibrium.

4. In torpedoes and the like, means for balancing the same, comprising a distributing-valve, flexible pipes leading therefrom, a stationary ring and a movable ring adapted to close one or more of said pipes between their circumference when torpedo is out of equilibrium.

5. In torpedoes or the like, a propelling and balancing means comprising a pump for pumping the propelling medium, means for distributing the medium, flexible pipes leading from said distributing means, in combination with means to close one or more of said pipes when the torpedo is out of equilibrium.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THEODOR GIBON.

Witnesses:

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LOGAN C. DAVIS.