

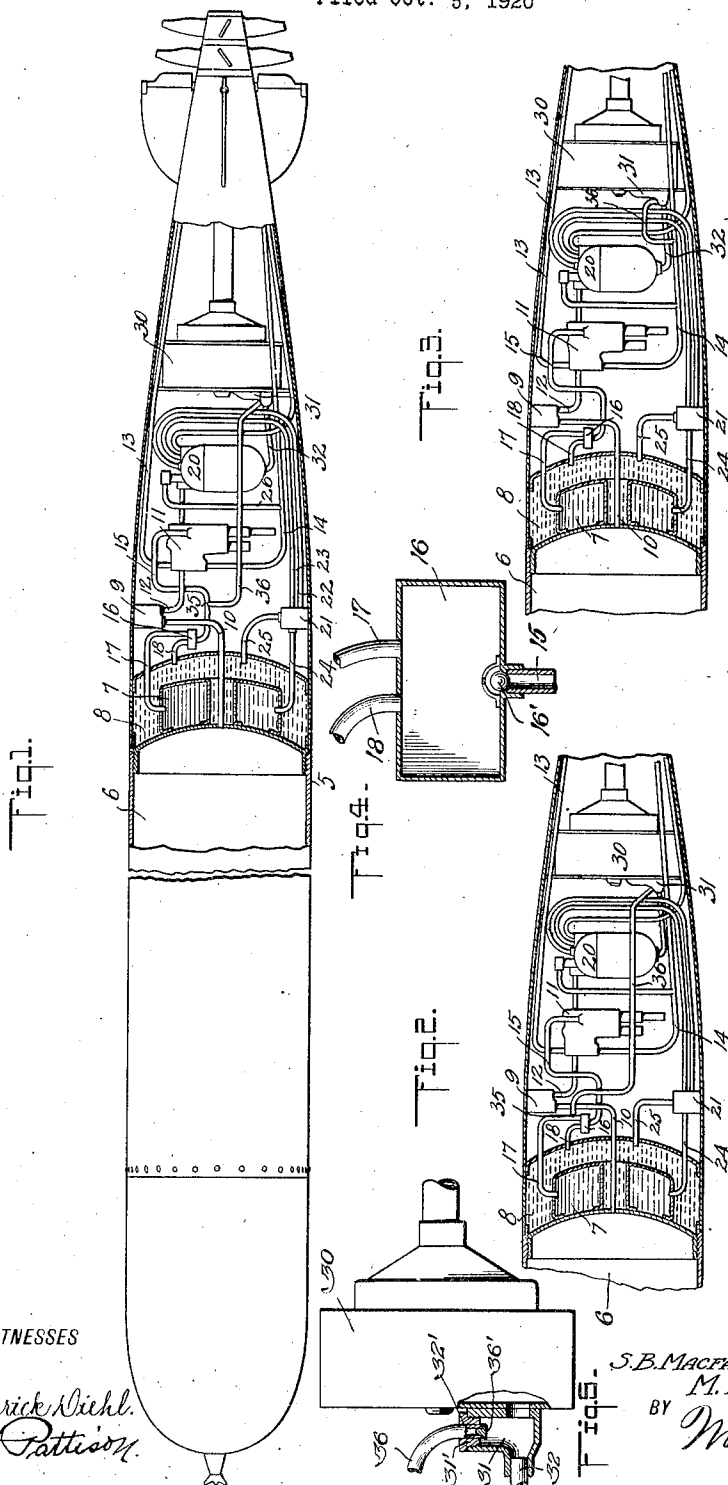
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TORPEDO

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WITNESSES

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TORPEDO.

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The present invention relates to new and useful improvements in torpedoes, and pertains more particularly to torpedoes of automobile type.

5 It is a well-known fact that torpedoes in their run heat up to such a degree that certain parts of the turbine motor expand thereby rendering the motor incapable of further use until the same has been overhauled and reconditioned. It often happens
10 that these expanded parts are thrown by centrifugal action from the turbine with sufficient force to puncture the shell, in which event the torpedo fills with water
15 and submerges, becoming a total loss.

It is one of the primary objects of the present invention to so construct a torpedo that its turbine will be incapable of heating beyond a predetermined temperature, which
20 temperature will be sufficiently low to prevent injury to its turbine.

In the accompanying drawings forming a part of the specification, three methods by which this result is obtained, are shown, and
25 said methods consist of the following: (1) means affecting the pressure by which the fuel and water are fed to the combustion pot; (2) means for controlling the pressure by which the fuel line is fed to the combustion
30 pot, and (3) a backing up in the entire system of the pressure equal to the pressure before it reaches the reducing valve, said pressure being preferably tapped from the main line of the gyro-spin motor.

35 It is a further object of the invention to provide a controlling device in the form of a thermal plug or other device, said plug being affected by the heat generated at the turbine nozzle and being adapted to actuate
40 the various pressures as above stated.

A further object of the invention is to provide a torpedo with controlling means of this character in such a manner that the present known construction is not materially
45 varied, thus making the device of the present invention adaptable to torpedoes already in use by merely slightly changing the construction thereof.

With the above and other objects in view,
50 reference is had to the accompanying drawings, in which

Figure 1 is a side elevation partly in section of a torpedo, said figure illustrating one form of the present invention;

Fig. 2 is a detail sectional view of a portion of the after end of the torpedo showing a modified form of the invention;

Fig. 3 is a similar view showing a still further modified form of the invention.

Figure 4 is a sectional view on an enlarged scale of the check valve and its casing.

Figure 5 is an elevation partly in section and on an enlarged scale of the turbine, and showing the pipe having a fusible plug connected with the nozzle thereof.

Referring to the drawings, the reference character 5 designates a torpedo, and 6 designates the air flask or tank thereof. In the common form of torpedo, a fuel tank 7 is provided and said fuel tank 7 is placed concentrically within a water tank 8 as more clearly shown in Fig. 1. The air flask is charged by means of a charging valve 9, from which a pipe 10 extends to the interior of the flask.

The reference character 11 designates the reducing valve and leading from the valve 9 into the reducing valve 11 is a main air-line 12, by means of which the air of the flask is introduced to the reducing valve 11. The reducing valve 11 has leading from its high pressure side two lines 13 and 14, the line 13 being the high pressure line to the distance gear (not shown), and the line 14 being the high pressure line to the gyro-spin (not shown in the present case).

Leading from the low pressure side of the reducing valve 11, is a line 15, and said line 15 leads to the housing 16 of the check valves 16'. Leading from the valve chest housing 16 are two lines 17 and 18, the line 17 being the pressure line for feeding the fuel from the fuel tank 7, while the line 18 is the pressure line for feeding the water from the water tank 8.

The reference character 20 designates the combustion pot, and leading into the combustion pot from the valve chest 21, are two lines 22 and 23, the line 22 being the fuel line to the combustion pot 20, while the line 23 is the water line to the combustion pot 20. The fuel is supplied to the valve chest 21 by means of a pipe 24 and water is supplied to the valve chest 21 by means of a pipe 25, it being understood that these pipes 24 and 25 extend from the valve chest into the fuel tank and the water tank, respectively. Branching off from the gyro-spin

line 14, is a line 26, and said line 26 is the high pressure air to the pistol of the combustion pot.

The turbine 30 is operated by means of superheated air formed within the combustion pot 20 and supplied to the turbine nozzle 31 by means of a pipe or line 32.

The several parts above described are commonly known in certain types of torpedoes as at present constructed, and it is in combination with these parts that the present invention is adapted to operate.

In the preferred form of the invention, a thermal device to be hereinafter referred to is positioned adjacent the nozzle 31, and leading from the thermal device at the nozzle 31 to the point 35 in the line 15 between the reducing valve 11 and the check valve 16, is a line 36. As shown the thermal device consists of a plug 36' secured in the end of the pipe within the nozzle 31 by means of fusible solder.

Assuming now that the torpedo has started on its run and the turbine 30 thereof begins to heat up to a degree in excess of that to which the thermal device is set: the thermal device operates to open the line 36 and upon opening the line 36 to the interior of the torpedo, the low pressure line 15 will be bled and the pressure passing through the check valve 16 to the fuel and water tanks will be decreased and will thereby decrease the amount of fuel and water fed to the combustion pot 20. When the supply of water and fuel to the combustion pot 20 is reduced, it will be apparent that the degree of temperature to which the air is superheated will be materially reduced, thereby providing for an automatic cooling of the turbine. With such a device in operation, it is obvious that the turbine will not heat to a degree of temperature which will affect its running qualities and that all that is necessary to again place the torpedo in operative condition is the installation of new thermal devices at the nozzle.

In that form of the invention shown in Fig. 2, the line 36 leads from the nozzle 31 to the pressure line 17 of the fuel tank 7. By this construction, it will be apparent that when the fusible device at the nozzle 31 fuses, the line 17 will be bled through the medium of the line 36, thus causing a cessation of feeding of the fuel to the combustion pot 20. Under these conditions, the turbine will operate under flask pressure until said flask pressure has been spent, at which time the turbine will cease operation.

In the form of the invention shown in Fig. 3, the line 36 is tapped into the nozzle 31, and its other end is connected to the line 14 of the gyro-spin. In this form of the invention when the fusible element of the nozzle 31 fuses, it will be seen that the high

pressure air in the line 14 will be allowed to pass by way of the products of combustion line 32 to the combustion pot 20, and owing to its excessive back pressure will prevent proper combustion in the combustion pot 20 and back up the whole system with an excessive air pressure which will render the same inoperative.

From the foregoing it will be seen that the present invention provides means for protecting the turbine of an automobile torpedo in such a manner as to prevent its overheating and therefore prevent a rupture of the several parts and a destroying or total loss of the torpedo.

While in the present instance we have shown three different means by which this result may be obtained, it is obvious that with the means at hand, various arrangements of mechanisms may be so positioned within the torpedo as to control the various pressures therein in such a manner as to render the torpedo inoperative when any or all of its working parts have reached a predetermined degree of temperature; and we therefore do not limit ourselves to the precise methods shown but may resort to any means for obtaining the end toward which this invention aims, i. e., the rendering of certain parts of a torpedo inoperative upon the generation by said parts of a predetermined degree of temperature.

We claim:

1. In a torpedo, a propelling engine, pressure generating means for supplying motive fluid to said engine, supply means for the generating means and thermal means operated by a generation of a predetermined degree of temperature of the engine for reducing the pressure in the supply means for the pressure generating means to render the motive fluid supply to the engine inoperative.

2. In a torpedo, a driving engine, a combustion pot, a connection between the combustion pot and the engine, fuel containers, means connecting the containers with the combustion pot, means for supplying pressure to the containers, and a thermal device in the connection between the combustion pot and engine and operated by a generation of heat in the engine to render the supply of motive fluid to the engine inoperative.

3. In a torpedo, a driving engine, a combustion pot, a connection between the pot and engine, a water tank, a fuel tank in the water tank, means connecting the tanks with the combustion pot, means for supplying air under pressure to said tanks, and including a check valve, a pipe connecting the engine with the air supply means, and a thermal device in the said pipe and operated by the generation of a predetermined degree of heat in said engine.

4. In a torpedo, a torpedo body having an air flask, a driving engine, a combustion pot, means connecting said pot with the engine, a water tank, a fuel tank in the
5 water tank, means connecting the combustion pot with the tanks, means for connecting the combustion pot with the engine, a charging valve connected with the air flask, a reducing valve connected with the charging valve, a valve casing connected with the 10 reducing valve, a check valve in the casing, connections between the valve casing and the said tanks, and a pipe having a thermal device therein and leading from the engine to the connection between the reducing 15 valve and valve casing.

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