C. LEVINSEN.

STEAM REGULATING VALVE.

APPLICATION FILED JAN. 9, 1917. RENEWED FEB. 6, 1919.

1,297,193. Patented Mar. 11, 1919.

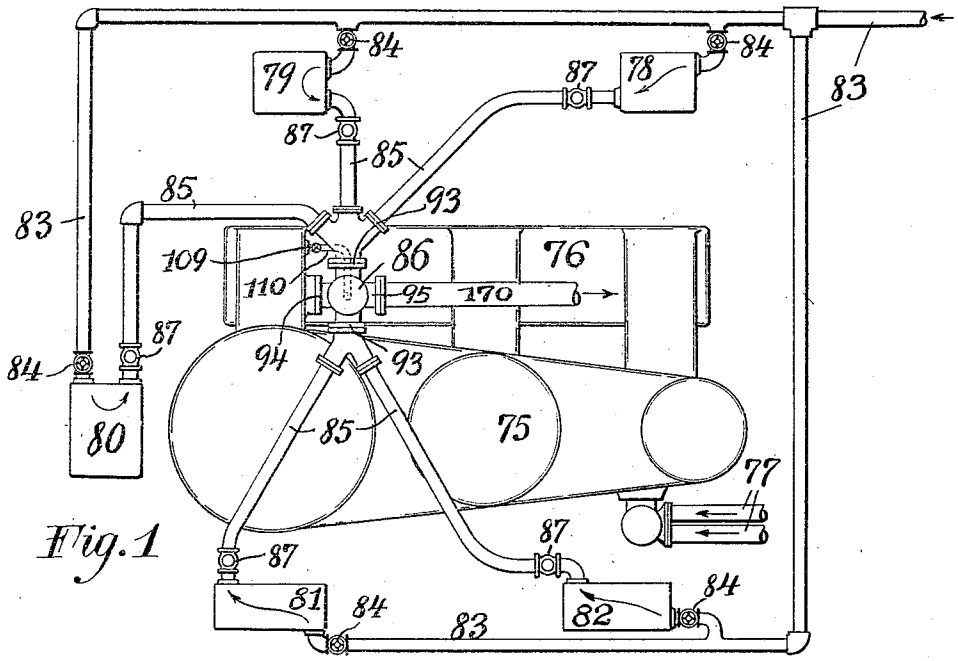


Fig. 1

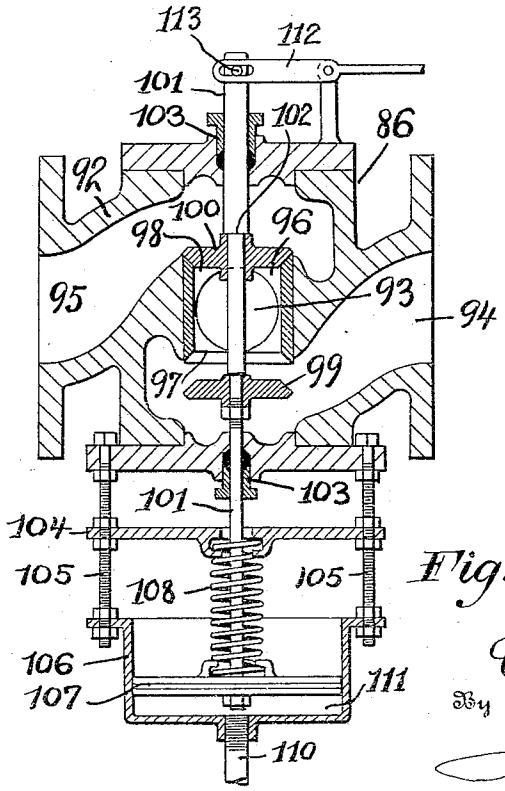


Fig. 2

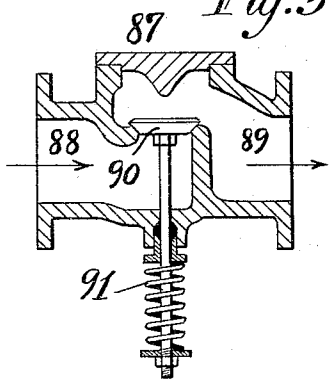


Fig. 3

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STEAM-REGULATING VALVE.

1,297,193. Specification of Letters Patent. Patented Mar. 11, 1919.

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To all whom it may concern:

Be it known that I, CLAUS LEVINSEN, a citizen of the Danish Monarchy, and resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Steam-Regulating Valves, of which the following is a specification.

The object of my invention is to provide an improved steam regulating valve especially adapted for use in marine steam power plants in order to improve the operation thereof with respect to safety, efficiency and automatic action. Another object of my invention is to provide a steam regulating valve similar to the one described in my pending application Serial Number 131,852, but of a somewhat modified and improved construction in order to obtain certain advantages in installation and operation as will appear hereinafter.

Accordingly my invention comprises a steam regulating valve constructed and operated as hereinafter set forth and also comprises certain combinations of elements including my improved valve. In the accompanying drawing I have shown my valve applied to a typical marine steam power plant. The drawing, is however, illustrative only and in no sense does it show the only possible embodiment of the valve, nor the only manner in which it may be used.

Figure 1 is a diagrammatic illustration of a marine steam power plant including my improved steam valve.

Fig. 2 is a vertical sectional view of the valve; and

Fig. 3 is a vertical sectional view through a certain type of check valve used in combination with the regulating valve.

Referring to Fig. 1, the numeral 75 designates a marine steam engine connected in the usual manner to its condenser 76. Steam is supplied to the engine through the steam mains 77. The numerals 78 to 82 inclusive indicate auxiliary power units or engines required for the operation of a vessel. Thus, 78 designates the boiler pump, 79 the bilge water pump, 80 the steering gear engine, 81 the generator unit for electric power and 82 the blower. The number of auxiliary units, their arrangement and location are immaterial so far as this invention is concerned.

The auxiliary units are supplied with steam from the boiler (not shown) through the steam pipes 83. Adjacent each unit or machine there is provided the usual steam valve 84 for controlling the steam supply thereto. The exhausts of the auxiliary machines are connected by pipes 85 to my improved regulating valve 86 which in turn is connected at the one side to the condenser 76 and at the other side connects with the common exhaust 170 which leads to the atmosphere or to an auxiliary condenser, not shown.

My steam regulating valve controls the communication between the exhaust of each auxiliary machine and either the condenser or the atmosphere (or auxiliary condenser). The object or function of the regulating valve 86 is to connect automatically the exhaust of the auxiliary machines with either the condenser or the atmosphere according to whether or not the main power unit 75 and the condenser 76 are in operation. In each of the exhaust pipes 85 is connected a check valve 87 which, as shown in Fig. 3 comprises a casing having an inlet 88 and an outlet 89 controlled by the valve 90 normally seated by a spring 91.

The regulating valve 86 comprises a valve casing 92 having inlets 93 connected on opposite sides to the auxiliary exhausts 85 as will be understood from an inspection of Fig. 1. The pipes 85 may, if desired, be connected all on the one side of the valve 86, or as shown in the drawing, the exhausts 85 are connected on opposite sides of the valve 86. Any suitable arrangement may be used and the connections may be made by means of standard or special fittings. The valve 86 is further provided with two outlets 94 and 95 leading respectively to the condenser 76 and the atmosphere by way of exhaust 170. The inlets 93 communicate with a valve chamber 96 having the two ports 97 and 98, leading to the outlets 94 and 95, and controlled by the valves 99 and 100 respectively. The valve 99 is fast on the spindle or valve stem 101 as shown, while the valve 100 is slidably carried on said valve stem. A shoulder 102 limits the upward movement of the valve 100 and serves as a means to close the same. 103 designates stuffing boxes.

Below the valve 86 there is mounted an abutment 104 by means of bolts 105 which also supports a cylinder 106 in which moves a piston 107 fast to the valve stem 101. 108 is a spring secured to the abutment 104 and the piston 107. The cylinder 106 forms a pressure chamber below the piston, which

chamber is connected to the main condenser 76 by a pipe 110 having a valve 109, see Fig. 1. The spring 108 tends to lift the piston 107 when the pressure below the latter reaches a certain predetermined value whereby the spring is enabled to overcome the atmospheric pressure upon the piston 107.

The operation of the main engine 75 and the condenser 76 reduces the pressure in the pressure chamber 111 within said cylinder 106, consequently the piston 107 is moved downward by atmospheric pressure, which overcomes the force of the spring 108, with the result that the valve 99 is opened and the valve 100 is closed as shown in Fig. 2.

If now one or more of the auxiliary units are operated, the exhaust steam therefrom will flow through the exhaust pipe or pipes 85 and the check valves 87 therein and to the valve 86 in which the steam will then pass out through the open port 97, outlet 94 and to the condenser 76. The check valves 87 prevent the exhaust steam from any one auxiliary steam unit from passing into another unit as is obvious.

It will therefore be seen, that as long as the main unit is operated, the exhaust steam from the auxiliary units will pass to the main condenser 76. But when the unit 75, 76 ceases to operate, the pressure in the pressure chamber 111 increases until at a predetermined pressure (less than atmospheric pressure) the spring lifts the piston 107 and closes the port 97 by valve 99. By adjusting the abutment 104 on the bolts 105 the action of the spring may be properly regulated.

If now none of the auxiliary units are working both of the valves 99 and 100 will remain seated, but if one or more of the auxiliary machines are operated, the exhaust steam therefrom will lift the valve 100 up against the shoulder 102 on the valve stem thereby opening the port 98 through which the exhaust steam will pass to the atmosphere (or auxiliary condenser) through outlet 95. When the main engine resumes operation, the pressure in the cylinder 106 will again be reduced, the piston 107 moves down, the valve 100 will be closed and the valve 99 will be opened and the exhaust steam from the auxiliary unit or units will again pass into the condenser 76.

Thus the exhaust steam from the auxiliary machines will pass through my regulating valve 86 to the condenser 76 while the main engine is operating, but will be automatically shunted through the valve so as to pass to the atmosphere (or auxiliary condenser) when the main engine ceases to operate. Thus, the operation of manually controlled valves for the same purpose is eliminated and only one automatic regulating valve is required together with the check valves in the exhaust pipes. The valve 86 may also be manually operated by the pivoted lever 112 by inserting a pin 113 in the spindle 101.

During maneuvers at sea or in the harbor or for other reasons, the main steam unit is operated intermittently for the proper control of the vessel as is obvious. At the same time one or more of the auxiliary units may be in operation. It will therefore be clear that my regulating valve automatically operates to pass the exhaust steam from the auxiliary machines to either the condenser or the atmosphere, thereby eliminating much labor and trouble and liability of danger due to the use of ordinary hand operated valves in the auxiliary exhausts.

I claim:—

A valve mechanism comprising a casing having a steam inlet and two outlets, a valve stem, a valve fixed to the latter for controlling the communication between said inlet and one of said outlets, a second valve slidably mounted on said valve stem for controlling the communication between said inlet and said other outlet, pressure regulated means for operating said valve stem to close the said first named valve and permit the said slidably mounted valve to be opened by the steam passing through said steam inlet and means on said valve stem for closing said slidably mounted valve.

Signed at New York, in the county of New York and State of New York this 28th day of December, A. D. 1916.

CLAUS LEVINSEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."