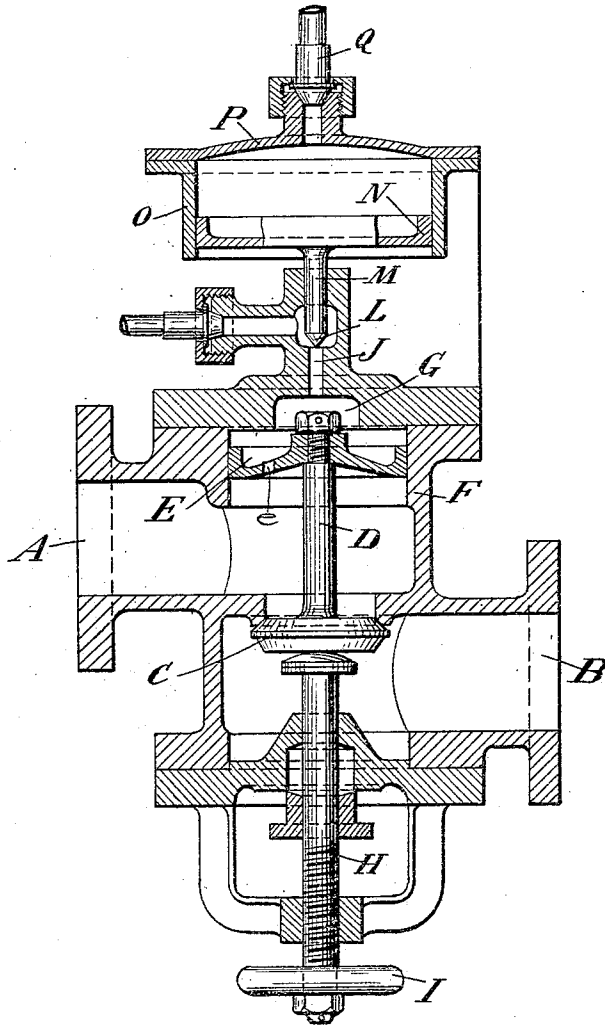


H. E. YARRÖW.  
 SAFETY DEVICE FOR OIL FIRED BOILERS.  
 APPLICATION FILED OCT. 30, 1917.

1,297,288.

Patented Mar. 11, 1919.



Witnesses:  
*C. A. Rowe*  
 C. A. Rowe

Inventor  
 Harold Edgar Yarrow  
 by  
*James L. Norris*  
 Attorney

# UNITED STATES PATENT OFFICE.

HAROLD E. YARROW, OF GLASGOW, SCOTLAND.

SAFETY DEVICE FOR OIL-FIRED BOILERS.

1,297,288.

Specification of Letters Patent.

Patented Mar. 11, 1919.

Application filed October 30, 1917. Serial No. 199,312.

*To all whom it may concern:*

Be it known that I, HAROLD EDGAR YARROW, a subject of the King of Great Britain, residing in Glasgow, Scotland, have invented a certain new and useful Safety Device for Oil-Fired Boilers, of which the following is a specification.

It has recently been found advisable to increase the air pressure in the working of oil fired boilers, more particularly for submarine vessels, and in such cases it is possible that a sudden reduction in the air pressure by the stoppage of the fan, or from other cause, may cause the flames to pass from the furnaces to the stokehold.

This danger is obviated if the oil supply to the furnaces is automatically closed, when the air pressure in the stokehold is reduced by a given amount. For this purpose, according to the invention, one face of a piston, movable in a cylinder is exposed to the air pressure existing in the stokehold, and the other face to the atmospheric pressure. A given reduction in the air pressure obtaining in the stokehold will displace the piston in the cylinder and thereby cause a valve controlling the oil fuel supply to the burners to be immediately closed.

The accompanying drawing shows in sectional elevation an example of a safety device according to the invention.

A is the inlet to and B the outlet from a passage controlled by a valve C which regulates all the oil fuel supplying one or more boilers. The valve C is connected by a spindle D to a piston E, movable in a cylinder F. A small hole *e* in the piston allows a little of the oil fuel to pass into a space G at the upper end of the cylinder, so that if the outlet from this space is closed, the same pressure is exerted on each face of the piston E. The area of the piston E is greater than that of the valve C, so that should an outlet be opened for the oil in the space G, the piston E will be raised by the oil pressure on its lower surface and close the valve C. The valve can also be manually closed at any time by operating a screw threaded spindle H by a hand wheel I.

The space G is connected with a narrow passage J closed by a needle valve L connected by a spindle M to a piston N movable in a cylinder O, which is open below but closed above by a cover P. The cover is in connection by the tube Q with the compartment under air pressure and as long as the

upper surface of the piston N is exposed to this pressure at its normal value the needle valve L closes the passage J and the valve C is kept open by oil pressure. Should the air pressure be largely reduced, the piston N is raised and opens the needle valve L, and the pressure being relieved from the upper surface of the piston E, the latter rises and closes the valve C.

In the description it has been assumed that the device is placed outside the compartment supplied with air under pressure; if it is placed within the compartment, the cylinder O would be closed below and open above, and a connection would be led from the cover to the atmosphere.

Having thus described the nature of the said invention and the best means I know of carrying the same into practical effect, I claim:—

1. An automatically operating device for preventing the passage of flame from the furnaces of an oil fuel boiler to the stokehold, comprising an oil fuel valve, a seat therefor, a stem carrying the valve, a cylinder, a piston movable in said cylinder and secured to said valve stem, means for the admission of oil fuel to the cylinder, means for the passage of the fuel from said cylinder to the furnaces when the oil fuel valve is open, a chamber connected with the cylinder at the end farther from the oil fuel valve, said piston having an opening communicating with said chamber, a passage from said chamber, a controlling valve adapted to close the passage, a second stem connected to said controlling valve, and a member connected with said last named stem for operating said controlling valve, said member being exposed on one side to the pressure of the air in the stokehold and on the other side to the normal atmospheric pressure.

2. An automatically operating device for preventing the passage of flame from the furnaces of an oil fuel boiler to the stokehold, comprising an oil fuel valve, a seat therefor, a stem carrying the valve, a cylinder, a piston movable in said cylinder and secured to said valve stem, means for the admission of oil fuel to the cylinder, means for the passage of the fuel from said cylinder to the furnaces when the oil fuel valve is open, a chamber connected with the cylinder at the end farther from the oil fuel valve, said piston having an opening communicating with said chamber, a pas-

sage from said chamber, a controlling valve adapted to close the passage, a stem connected to said controlling valve, a second cylinder, a piston adapted to move in said  
 5 second cylinder and secured to said last mentioned valve stem, and means by which one side of said last named piston is exposed to the atmospheric pressure and the other side to the air pressure in the stokehold.

10 3. An automatically operating device for preventing the passage of flame from the furnaces of an oil fuel boiler to the stokehold, comprising an oil fuel valve, a seat therefor, a stem carrying the valve, a cylinder, a piston movable in said cylinder and  
 15 secured to said valve stem, means for the admission of oil fuel to the cylinder, means for the passage of the fuel from said cylinder to the furnaces when the oil fuel valve  
 20 is open, a chamber connected with the cylinder at the end farther from the oil fuel valve, said piston having an opening communicating with said chamber, a passage from said chamber, a controlling valve adapted to close the passage, a stem connected to said  
 25 controlling valve, a member connected with said last named stem for operating said controlling valve, said member being exposed on one side to the pressure of the air in the stokehold and on the other side to the normal atmospheric pressure, and hand operated means for closing said oil fuel valve.  
 30 In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HAROLD E. YARROW.

Witnesses:

JAMES RITCHIE,  
 SILVESTER LITTON.

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