Feb. 16, 1926. 1,573,304

P. G. DARLING

VALVE

Filed Feb. 16, 1924

Fig. 2.

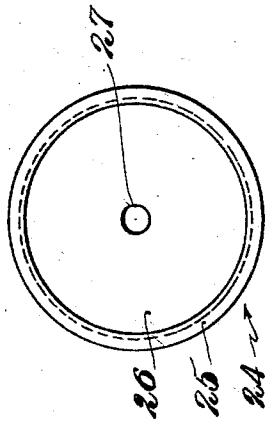


Fig. 3.

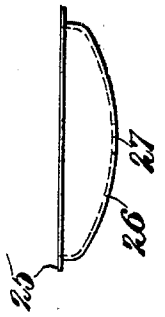
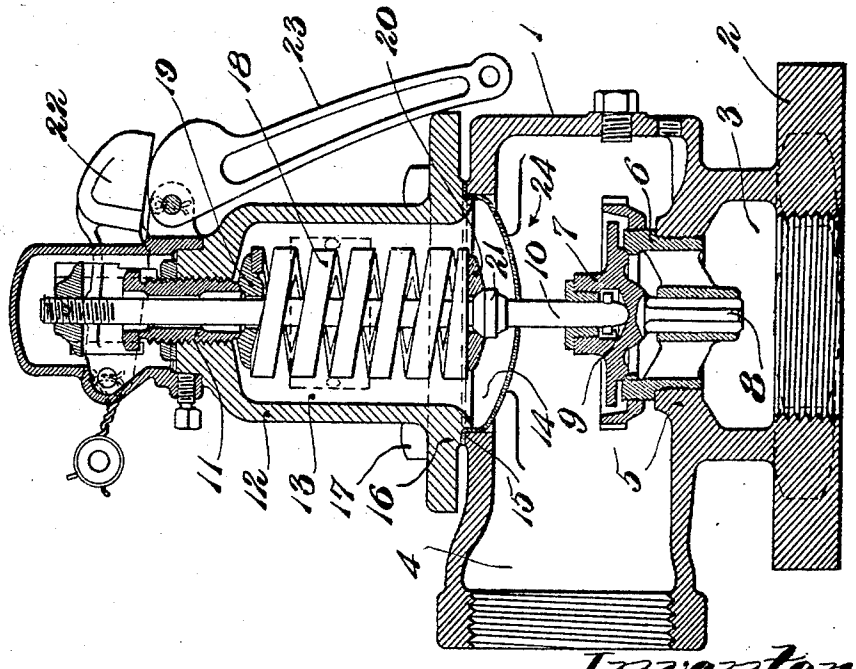


Fig. 1.



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UNITED STATES PATENT OFFICE.

PHILIP G. DARLING, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO MANNING, MAXWELL & MOORE, INC., OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

VALVE.

Application filed February 16, 1924. Serial No. 693,261.

To all whom it may concern:

Be it known that I, PHILIP G. DARLING, a citizen of the United States of America, and resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented new and useful Improvements in Valves, of which the following is a specification.

This invention relates to steam safety valves of the spring controlled type, and more particularly to medium and low pressure valves such as are commonly used for fire tube boilers, etc.

The principal object of the present invention is to provide a device for protecting the valve spring from the action of the escaping steam but without unduly increasing the cost of production of such valves, the protective device being so designed that it may be applied to or omitted from the valve at the option of the maker or user.

In the accompanying drawings a preferred embodiment of the invention is illustrated by way of example, in which:

Fig. 1 is a vertical section through a valve of the usual type having the protective device of the present invention applied thereto;

Fig. 2 is a plan view of the protective device removed from the valve; and

Fig. 3 is a side elevation of such protective device.

The numeral 1 indicates a valve casing having an attaching base 2, an inlet chamber or passage 3, and an outlet chamber or passage 4. An apertured partition 5 separates the inlet and outlet chambers in the usual manner and furnishes a support for the removable ring 6 whose upper edge is beveled to provide an annular valve seat.

A disk valve 7 co-operates with the valve seat to close the opening between the chambers 3 and 4. In the example herein illustrated, the valve disk is preferably provided with a downwardly extending guide element 8 and has a socket 9 in its upper surface for the reception of the lower end of the valve spindle 10. Wings or other usual forms of guide may be substituted for the element 8 and any desired connections between the spindle and disk may be used instead of those here shown. The valve spindle 10 is guided near its upper end in a bushing 11 carried by a spring housing 12 providing a chamber 13 for the reception of the valve spring.

The spring housing 12 is arranged above and substantially coaxially with the valve seat ring 6, and in the usual or unimproved valve the chamber 13 of the housing communicates with the outlet chamber 4 by means of an opening 14 in the wall of the casing, such opening being of substantially the same diameter as the spring housing. The casing is provided with an annular lip or flange 15 at the edge of the opening 14 which fits within a rabbet in a flange 16 at the lower end of the housing 12. The housing 12 is removably secured in position upon the casing 1 by means of bolts 17, and is preferably provided with one or more vent openings.

The valve controlling spring 18 is arranged within the chamber 13 surrounding the spindle 10. Its upper end bears against a fixed collar 19 while its lower end rests upon a collar 20 supported by an enlargement 21 upon the spindle 10. The usual valve lifting levers 22, 23 may be provided for manually raising the valve from the seat for testing, etc.

The construction described is one commonly employed in medium and low pressure safety valves supplied for use with fire-tube boilers, such valve containing relatively few parts and being capable of production at low cost.

With the construction thus far described the valve spring 18 would be exposed to the escaping steam in the chamber 4. In accordance with the present invention a partition or septum 24 is arranged between the chambers 13 and 4 so as to prevent steam from entering the chamber 13. This partition preferably consists of a dished sheet metal plate provided with a peripheral flange 25 having a stiff substantially unyielding central portion which is downwardly concave and furnished with an opening 27 at its center. This opening is preferably of a diameter such that the spindle 10 may have a close sliding fit therein. The partition or septum 24 seats snugly in the opening 14 of the casing with its flange 25 overlying the upper surface of the rib 15 and when thus arranged the housing 12 may be secured in position in the usual manner, clamping the septum in place. As the opening 27 for the passage of the valve spindle is not substantially larger than the spindle, little if any steam enters the chamber 13 so that the spring is not exposed

to the hot escaping steam, and damage to the spring is thus avoided.

The septum or partition member thus provided is applicable to existing valves without change in the latter and may be installed by the maker or user of the valve. If at any time it be desired to dispense with this partition, it is only necessary to remove the housing 12, take out the partition and then replace the housing 12, when the valve is restored to its original condition.

I claim:

1. In combination with a safety valve having a casing provided with an outlet chamber, a valve seat, a valve head, said head being subjected to pressure tending to lift it from its seat, a removable spring housing secured in concentric relation to an opening in the wall of the outlet chamber of the casing, a spring in the housing, a spindle for transmitting movement from the spring to the valve head, and a septum of thin sheet material having a central dished portion convex toward the valve head whereby to make it stiff and unyielding and having a flat peripheral flange, said flange being adapted at will to be interposed and clamped between opposed surfaces of the spring housing and the casing, which surfaces, except for the interposition of the septum, would contact directly with each other, the central convex part of the septum when so positioned forming a fixed partition between the interior of the housing and outlet chamber.

2. In combination with a safety valve having a casing provided with inlet and outlet chambers, a valve seat and a valve head, the casing having a flat annular seat surrounding an opening in the wall of the outlet chamber coaxial with the valve seat, a spring housing coaxial with the opening removably secured to the casing, said housing having an annular bearing face of substantially the same width as said annular seat, a spring in the housing, and means transmitting pressure from the spring to the valve head, of a stiff substantially rigid sheet metal plate having a flange constructed and arranged to be clamped between the annular bearing surface of the spring housing and the annular seat of the casing and having a dished central portion convex toward the valve head and forming an immovable partition between the interior of the spring housing and the outlet chamber, the flange of said metal plate being substantially of the same radial width as the annular seat and bearing surfaces of the casing and spring housing respectively.

Signed by me at Bridgeport, Connecticut, this 31st day of January, 1924.

PHILIP G. DARLING.