H. F. LAUBACH.

COMBINED CHECK AND CUT-OFF VALVE.

APPLICATION FILED MAR. 20, 1917.

1,291,939.

Patented Jan. 21, 1919.

2 SHEETS—SHEET 1.

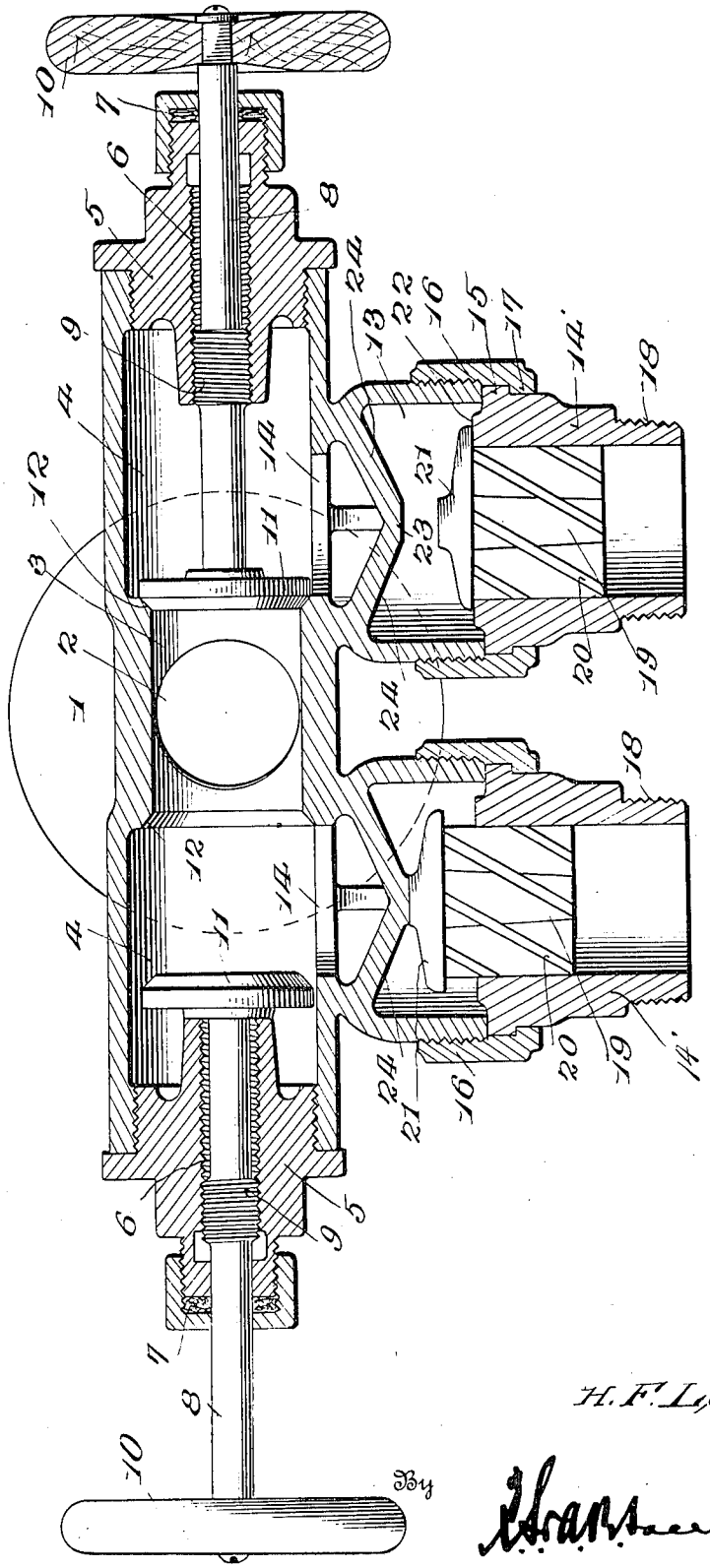


Fig. 1.

Witness

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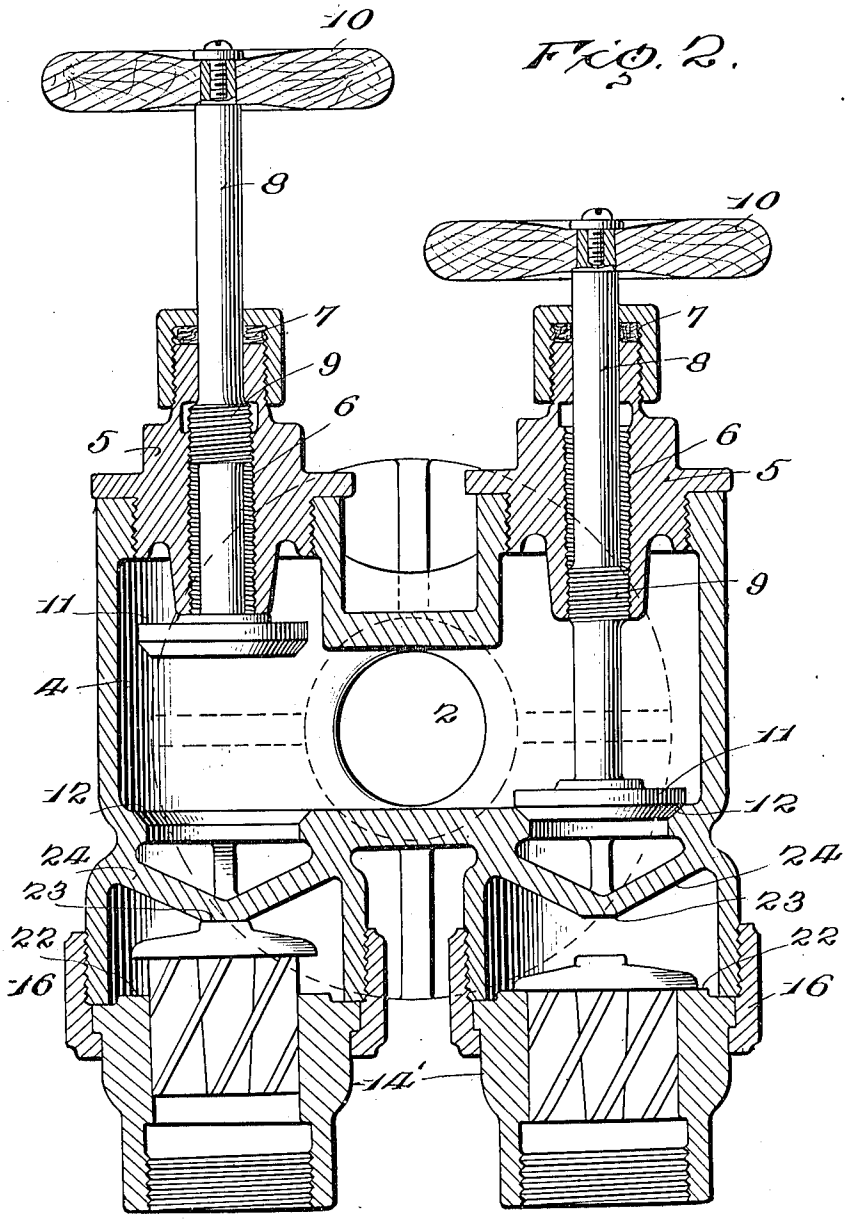
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2 SHEETS—SHEET 2.

FIG. 2.



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COMBINED CHECK AND CUT-OFF VALVE.

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To all whom it may concern:

Be it known that I, HIRAM F. LAUBACH, a citizen of the United States, residing at Tacoma, in the county of Pierce and State of Washington, have invented certain new and useful Improvements in Combined Check and Cut-Off Valves, of which the following is a specification.

This invention relates to steam boiler valves and more particularly to an improvement in valves such as are employed for the purpose of controlling the supply of feed water to the boiler. Such valves ordinarily embody a check valve and it has been proposed to interpose between the check valve and the outlet from the valve casing a cut-off valve so that in the event of injury to the check valve or in the event that it becomes necessary to regrind the valve and its seat, the cut-off valve might be closed thereby permitting of the safe removal of the check valve for the purpose stated. While by reason of the provision of the cut-off valve it becomes unnecessary to "kill" the engine until after the check valve has been repaired and replaced, nevertheless it would not be practical to supply feed water to the boiler before the said check valve had been replaced. The present invention, therefore, aims to provide a double valve of this class, the same comprising a double casing having a single outlet to the boiler and two inlets, there being a cut-off valve and a check valve interposed between each inlet and the outlet and the two sets of valves being independent so that in the event of injury to one of the check valves and the injury is such that it would be impracticable to replace the valve before it became necessary to again supply feed water to the boiler, the corresponding cut-off valve might be closed and the other cut-off valve then opened so as to permit of feed water being supplied past the other check valve.

It is also desirable at times to expedite the supplying of feed water to the boiler and, therefore, another object in view in providing a double valve of this class is to permit of feed water being supplied through both branches of the casing simultaneously.

In the accompanying drawings:

Figure 1 is a vertical longitudinal sectional view through one form of valve embodying the present invention;

Fig. 2 is a similar view through another form of the invention.

Briefly stated, the valve casing is provided with an outlet to the boiler and at each side of the outlet with a cut-off valve chamber and a check valve chamber and inasmuch as the two forms of the invention shown in the drawings are substantially identical so far as details of structure are concerned, corresponding parts in the two figures are indicated by corresponding reference numerals, the chief difference between the two forms being that in one instance the cut-off valve chambers are horizontally disposed, whereas in the other instance they are vertically disposed. The valve chamber is indicated in general by the numeral 1 and is provided with an outlet port 2 leading to the boiler. An intermediate passage 3 is in communication with the port 2 and with both of the cut-off valve chambers and in that form of the invention shown in Fig. 1 of the drawings the cut-off valve chambers which are indicated by the numeral 4 extend laterally in opposite directions from the passage 3 with their axes horizontally disposed and in alinement. A plug 5 is threaded into the outer end of each chamber 4 and is formed with a threaded bore 6, the plug being provided at its outer end with a packing gland 7 and the stem of the cut-off valve, indicated by the numeral 8, being rotatably fitted through the said gland and being provided with a threaded portion 9 adjustably fitting within the bore 6. At its outer end each stem is provided with a suitable handle 10 and at its inner end with a valve head 11 designed to be adjusted toward and from its seat 12 through rotation of the said stem. In that form of the invention shown in Fig. 1 in which form the cut-off valve chambers are horizontally disposed, the valve seats 12 are formed at the opposite ends of the passage 3 whereas in the form shown in Fig. 2 of the drawings, in which form the said cut-off valve chambers are vertically disposed, the said seats 12 are located at the lower ends of the said cut-off valve chambers substantially in a plane with the lower side of the port 2. In either event, however, when both cut-off valves 11 are closed no feed water can enter the passage 3 and pass to the boiler although either valve may be opened for this purpose, or, both may be opened to permit passage of feed water simultaneously through the two branches of the casing.

In both forms of the invention the check

valve chambers are vertically disposed and in each instance each chamber comprises a fixed section 13 in the nature of a cylindrical downward extension from the underside or lower end of the corresponding cut-off valve chamber in Figs. 1 and 2, respectively, there being a port or passage 14 establishing communication between the fixed section 13 of each check valve chamber and the corresponding cut-off valve chamber. Each check valve chamber further includes a removable section 14′ interiorly cylindrical and provided exteriorly near its upper end with an annular shoulder 15 which, at its upper side, abuts against the lower end of the respective section 13, a collar 16 being threaded on to each section 13 and being provided at its lower end interiorly with an annular shoulder 17 engaging the underside of the shoulder 15. The lower ends of the check valve chamber sections 14′ are threaded, as at 18, either exteriorly, as shown in Fig. 1, or interiorly, as shown in Fig. 2, for the connection of the feed water supply pipe (not shown). Interiorly, however, each section 14′ is smooth at its upper end to rotatably receive the stem of the respective check valve, the stem being indicated by the numeral 19 and being provided with spiral or oblique wings 20 which, when acted upon by the feed water entering the valve casing, impart rotary motion to the check valve. The head of the check valve is indicated by the numeral 21 and the underside thereof is smoothly ground so as to coact with a raised valve seat 22 surrounding the upper end of the bore of the section 14′. In order to limit the opening movement of the check valve, an abutment 23 is located within the upper end of the section 13 of each check valve chamber and is supported by integral spider arms 24.

From the foregoing description of the invention it will be understood that either or both of the cut-off valves may be opened to admit feed water to the boiler and that in the event of injury to either one of the check valves, the corresponding cut-off valve may be closed after which the said check valve may be removed and repaired or replaced. It will also be understood that the removal of either check valve does not necessitate killing the locomotive inasmuch as the feed water may be introduced into the valve casing through the other check valve chamber.

Having thus described the invention, what is claimed as new is:

In a valve, a casing having an outlet and provided with cut-off valve chambers disposed on opposite sides of the outlet, there being an unobstructed passage extending in a straight line between the outlet and valve chambers and establishing direct communication therebetween, a cut-off valve arranged within each of said chambers, a check valve chamber in communication with each of the cut-off valve chambers, and a check valve in each of said check valve chambers.

In testimony whereof I affix my signature.

HIRAM F. LAUBACH. [L. S.]