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2,199,611

VALVE OPERATING STRUCTURE

Original Filed Oct. 14, 1935

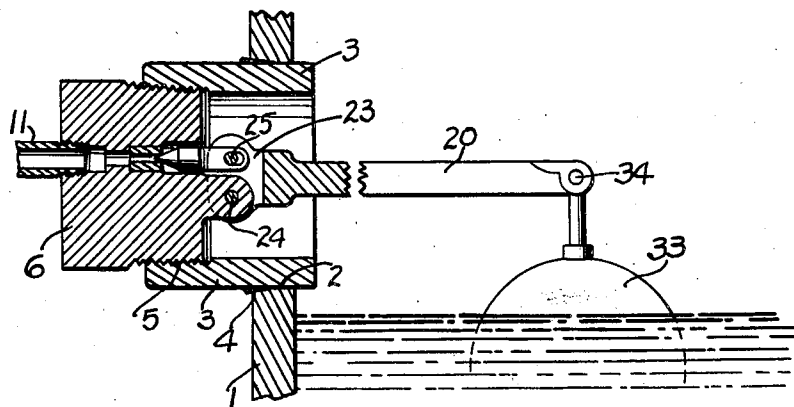


Fig. 1.

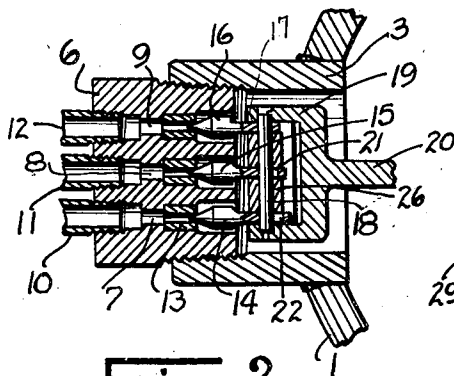


Fig. 2.

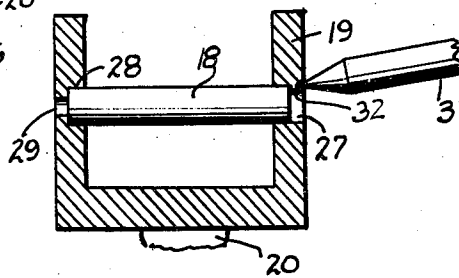


Fig. 3.

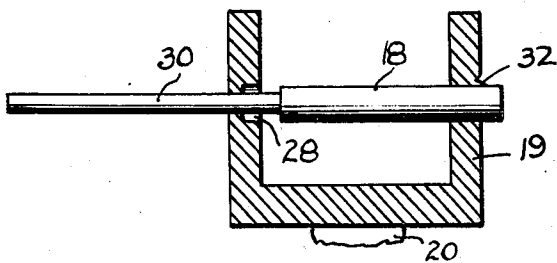


Fig. 4.

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VALVE OPERATING STRUCTURE

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Original application October 14, 1935, Serial No. 44,988. Divided and this application May 28, 1938, Serial No. 210,585

5 Claims. (Cl. 137—104)

The invention relates to the structure of a valve operating device.

While the device is capable of general application I have illustrated it particularly in connection with the operation of valves in outlets from steam boilers. It is sometimes desirable to provide a plurality of steam outlets from the boiler through which steam may be directed to operate regulators, fuel or water valves, and the like. Such a construction is usually operated in response to the level of the water in the boiler and my device is so illustrated.

It is an object of the present invention to provide means in connection with a single lever to operate a plurality of valves at different stages relative to the height of the water in the boiler.

It is desired that the valves be opened in a predetermined sequence so that the steam may be allowed to pass through one line first and then through other lines in a predetermined sequence.

The invention also involves a structure which is strong and compact and easily assembled in position.

The invention further involves the structure of the valve operating means through which the valve operating pin is held in position with a minimum amount of labor and expense.

The invention will be better understood in connection with the description of the drawing herewith in which

Fig. 1 is a vertical section through a valve assembly shown as connected with the float operated lever.

Fig. 2 is a horizontal section through the assembly disclosed in Fig. 1, the float being omitted.

Fig. 3 is a transverse detail of the yoke showing the manner in which the valve operating pin is secured in position.

Fig. 4 is a view similar to Fig. 3 showing the manner in which the pin may be removed when desired.

The present application is a division of my co-pending application Serial No. 44,988, filed October 14, 1935, for Safety appliance for boilers.

In carrying out my invention I contemplate forming in the wall 1 of the steam boiler an opening 2 formed to receive a collar 3 adapted to be welded in position in said opening, as shown at 4. The collar 3 is threaded at its outer end at 5 to receive a plug 6.

The plug 6 is formed to screw within the opening in the collar 3 and to provide outlets therethrough for the steam from the boiler.

There may be two or more of these openings and

in the present embodiment I have shown three outlet passages through the plug, said outlets 7, 8 and 9 having at their outer ends steam conducting pipes, 10, 11 and 12, respectively. It will be understood that said pipes may conduct the steam to any steam operated device.

At the inner ends of the passages 7, 8 and 9 are inserted valve seats 13. Each valve seat is adapted to cooperate with an adjacent valve, the valves 14, 15 and 16 cooperating with the outlets 7, 8 and 9, respectively. Each valve has a rearwardly extending valve stem 17 with an opening therein to receive a cross pin 18 mounted within a yoke 19 on the valve operating lever 20. In order that the valves may be operated in a predetermined sequence the openings through which the cross pin 18 passes are of different lengths in the different valve stems. I have shown the stem of the valve 16 as providing a close fit about the pin 18. In the stem of the valve 15, however, the opening is elongated, as shown at 21, and the opening in the stem of the valve 14 is elongated still more, as shown at 22. It will be obvious from this construction that when the lever is operated to move the valves the valve 16 will be moved first and at a predetermined interval thereafter the valve 15 will be opened and at a still later interval the valve 14 will open.

The lever 20, which is employed to operate the valves has at its end adjacent the valve a yoke 23. The lower end of the yoke engages with a pivot pin 24 which forms a fulcrum for the lever and allows the swinging of the lever in a vertical plane. At a point above the fulcrum 24 the cross pin 25 is mounted so as to engage through the openings in the valve stem as previously described. Between adjacent stems I provide spacers 26 which assist in maintaining the valves spaced equally along the pin 18.

With reference to Figs. 3 and 4, I have shown how the pin 18 may be secured in position in the yoke of the lever with a minimum consumption of time and labor. The yoke 19 is formed with an opening 27 at one side and on the opposite side there is a recess 28 which extends only part way through the wall of the yoke. At the end of the recess, however, there is a small opening 29 through which a punch 30 may be inserted to drive the pin from its mounting. In order to hold the pin in position with one end in the recess 28 I upset the metal about the opening 27 with a chisel or other instrument 31 so that it will prevent longitudinal movement of the pin from its seat. It will be obvious, however, that this upset

projection shown at 32 may be driven from its position holding the pin in place by the punch 30 when it is desired to remove the pin.

The lever 20 is operated by a float 33 in the present embodiment, said float having a pivotal connection at 34 with the end of the lever.

In the operation of my device it will be obvious that the valves will be opened in response to predetermined levels of the water in the boiler. When the water is above a certain level all of the valves will be closed, but as the level is depressed first one will open and then the next, and finally the third. It will be seen, however, that if the level of the water is not lowered beyond a certain point all of the valves need not open, but each valve will open when the proper level of the float in the boiler is reached.

My invention is exceedingly simple. It will be obvious that the plug 6, upon which the valve structure is mounted, is one unitary device and that the removal of the plug will allow access to all of the valves in an obvious manner. The device is simple and strong in construction and will not easily get out of order or fail to function.

I claim:

1. A housing, a plurality of outlet passages through said housing, a valve in each of said passages, said valves having slots of varying lengths in one end to determine the order in which they are opened, a pin through said slots operated by a lever fulcrumed within said housing, a float on the end of said lever, whereby said valves are opened one at a time in sequence, responsive to the downward movement of said float.

2. A housing having an opening, a plug in said opening, a plurality of outlet passages through said plug, a valve in each of said passages, a valve operating lever fulcrumed on said plug and ex-

tending into said housing, a float on the inner end of said lever, a cross pin on said lever, stems on said valves having openings therein to receive said cross pin, said valve stem openings being of varying length, whereby the downward movement of said lever will cause said pin to engage said valve stems to open said valves in sequence, one after the other.

3. A housing having an opening, a plug in said opening, a plurality of outlet passages through said plug, a valve in each of said passages, a valve operating lever fulcrumed on said plug and extending into said housing, a float on the inner end of said lever, a yoke on said lever, a cross pin in said yoke, stems on said valves having slotted openings therein to receive said cross pin, the openings in each stem being of a length different from that of the others, whereby said valves are timed to be opened by said lever arm in a predetermined order.

4. A plug adapted to close a fluid outlet and having a plurality of fluid passages therethrough, a valve in each of said passages, a float operated lever fulcrumed upon said plug, a yoke on said lever, a cross pin on said yoke, valve stems on said valves with slotted openings therein to be engaged by said pin, said openings being of different lengths for the purpose described.

5. A plug adapted to close a fluid outlet and having a plurality of fluid passages therethrough, a valve in each of said passages, a float operated lever fulcrumed upon said plug, a pin carried by said lever, stems on said valves having openings therein through which said pin extends, the opening in each stem being of different length from the others and means to secure said pin in said lever.

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