

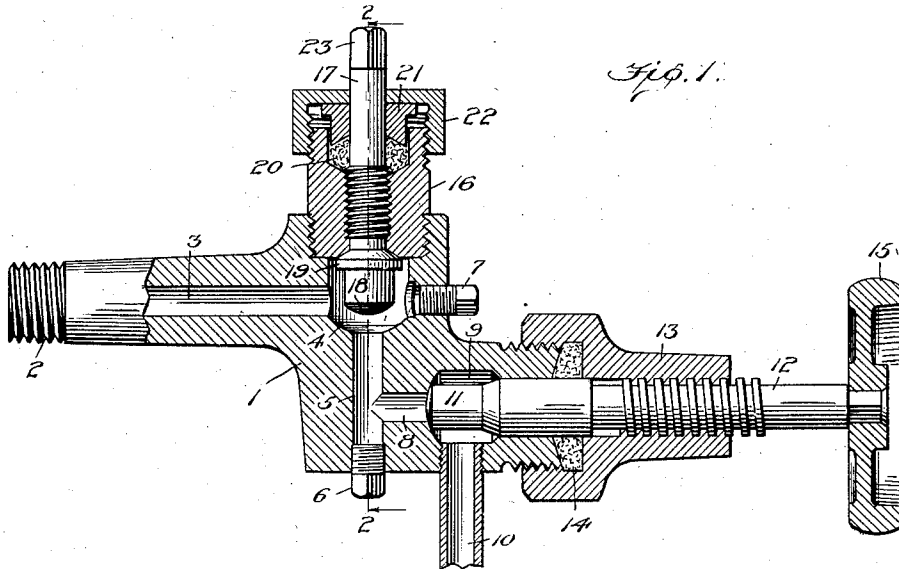
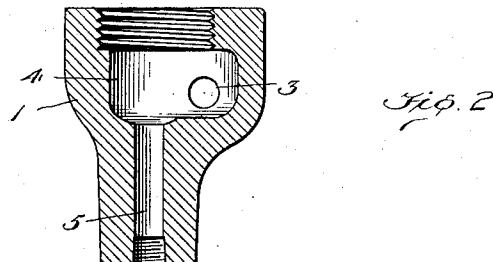
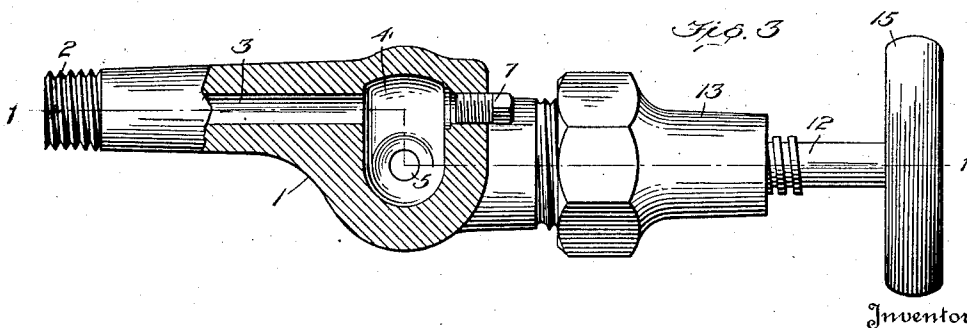
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GAUGE COCK FOR STEAM BOILERS

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GAUGE COCK FOR STEAM BOILERS

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This invention relates to gauge cocks for steam boilers, and the principal object thereof is to provide an improved form of gauge cock, the surfaces of which valve may be reground without "killing" the boiler or without detaching the gauge cock from the boiler.

Another object is to provide a gauge cock which may be readily cleaned without removal from the boiler and without taking the valve to pieces.

A still further object is to provide a self-packing gauge cock, also a gauge cock with the parts so arranged as to reduce the tendency for high pressure steam to cut or erode the valves and seats.

A still further object is to provide a gauge cock having an internal chamber with a plurality of passageways extending in angular directions therefrom, and with valves arranged in the chamber and in one or more of the passageways to control the flow of fluid therefrom.

Another object is to provide a gauge cock with the passageways therein so constructed that a pronounced distinction can be made between the discharge of steam and the discharge of water therethrough.

With such general objects in view, the invention consists of the formation, combination and arrangement of parts as will be herein described and particularly claimed.

In the accompanying drawings, which show a preferred form of the invention:

Figure 1 is a longitudinal, vertical section through a gauge cock constructed in accordance with the principles of the present invention, the section being approximately on the line 1—1 of Figure 3.

Figure 2 is a transverse vertical section through a portion of the body of the gauge cock, this view being taken substantially on the line 2—2 of Figure 1, only the body of the cock being shown.

Figure 3 is a partial longitudinal sectional view and a partial plan view of the gauge cock.

Referring to the drawings, the gauge cock embodies a body portion 1, the left hand end of which, as pictured in the drawings, being

provided with an external screw-threaded portion 2 adapted to be screwed into the shell of the boiler. A fluid passageway 3 extends axially through this threaded stem portion of the body and terminates at its inner end in an enlarged chamber 4. The passageway 3 places the chamber 4 in fluid communication with the steam and water space of the boiler when the cock is attached to the boiler shell as above described.

Extending away from the chamber 4 in a direction substantially at right angles to the line of the passageway 3 is a second passageway 5. This passageway is for convenience carried entirely through the body 1, and is then normally closed at the external surface of the body by means of a screw plug 6. Directly in line with the passageway 3 is another opening to the exterior of the body of the cock and this is normally closed by means of a screw plug 7. The hole into which the screw plug 7 is screwed extends in reality from the exterior of the body of the cock into the chamber 4, but as before mentioned, it is arranged in direct axial alinement with the passageway 3, so that this passageway may be cleaned out upon removal of the plug 7 and the passageway 5 may be similarly cleaned out upon removal of the plug 6. Near the lower end of the passageway 5, a third passageway 8 leads off from the passageway 5 in a direction substantially at right angles thereto. This passageway 8 lies substantially parallel with the passageway 3, but is offset somewhat therefrom. The outer end of the passageway 8 terminates in a cavity or enlargement 9, and from this enlarged portion, a discharge tube 10 leads directly to the atmosphere.

That portion of the body which carries the passageway 8 and the enlargement 9 thereof extends outwardly in stem fashion to provide a connection for a service valve 11, which is adapted to normally close off the flow of fluid from the passageway 8 through the tube 10. This valve preferably consists of a threaded stem 12, which cooperates with an internally threaded bonnet 13, which latter is screwed fast to the exterior of the outer end of the valve. A packing ring 14 seats

between the bonnet 13 and the valve body to prevent escape of steam along the valve stem. The innermost end of the valve stem 12 seats directly, in compression fashion, against a seat formed by the enlargement 9 of the passageway 8, to thereby stop off the flow of steam through the passageway 8 at this seat. An ordinary hand-operating wheel 15 is shown as attached to the outer end of the stem 12.

Directly above and in line with the passageway 5 is an internally threaded opening leading from the chamber 4 to the exterior of the body of the cock and in this is screwed a valve stem bushing 16. Screw threaded within this bushing is a valve stem 17, the lower end of which comprises a double seating valve. The lowermost face 18 of this valve stem forms a compression valve which, when the valve stem is screwed down and inwardly of the chamber 4, will seat against the bottom of the chamber 4, and thereby prevent the flow of fluid from the chamber 4 to the passageway 5. Slightly above the lower end of the stem 17 and arranged immediately beneath the bottom end of the bushing 16 is an annular enlargement 19 on the valve stem and this is arranged to form an upwardly active valve for cooperation with the bottom of the bushing 16 to prevent the escape of steam along the valve stem 17. At times when the valve is under pressure the face 18 is down against its seat so that it is necessary that regular valve stem packing be provided for the valve 17. This is shown at 20, a gland 21 and nut 22 of the ordinary type being employed therewith. The uppermost end of the valve stem 17 extends outside of the body of the cock and is there squared at 23 for the application of a wrench or other means for rotating the same. When the stem 17 is turned down or propelled inwardly by the threads provided for the purpose, the chamber 4 will be shut off from the passageway 5, and all portions of the cock outwardly therefrom may be dismantled without danger of injury from steam. Thus the valve 11 may be reground, or the packing 14 renewed. The channels 5 or 8 or the cavity 9 may be cleaned out or the tube 10 cleaned or renewed. When the stem is rotated to propel the same outwardly the enlargement 19 seats against the bottom of the bushing to seal the stem against leakage.

The valve stem 17 must, because of the enlargement 19, be entered into the bushing 16 from the inner face of the latter, and it will furthermore be noted that the axis of the channel 5, which corresponds with the axis of the valve stem 17, is offset a sufficient distance from the axis of the passageway 3 so that, upon removal of the plug 7, a wire or rod may be pushed in through the passageway 3 without interference by any portion of the valve stem 17. The plug 7 is also so lo-

cated that the bonnet 13 will not interfere with its removal and with the use of the cleaning rod or wire, as above mentioned.

Because of the offset arrangement of the passageways and the provision of one or more chambers or enlargements therein, it has been found that there is less cutting of the valves, particularly the valve 11. It has also been found that with this arrangement, when water or steam is expelled through the tube 10, it is easier for the attendants to distinguish between them.

As the valve 18 is only used in emergency, as when regrounding or repairing the outer portions of the cock, it sometimes happens that the seat between 18 and the bottom of the chamber 4 will not be perfect, and there will be a slight leakage of steam that might interfere with the work on the outer portions of the valve. By removal of the plug 6 at such times, such steam leakage may escape directly out of the opening 5 and will not interfere with the desired work or repairs. The presence of the bottom end of the valve stem 17 in the chamber 4 also causes the moving steam to take a circular path, and it has been found that this sets up a scouring action that to a large extent keeps this cavity and the adjacent portions of the mechanism cleaned.

I have thus described an embodiment of my invention. Other embodiments are contemplated within the scope of the appended claims without departing from the spirit thereof.

What is claimed is:

1. A gauge cock for steam boilers embodying a body having a portion thereof adapted for connection to the boiler, a passageway in said portion arranged for fluid communication with the boiler at one end thereof, a chamber formed at the other end of the said passageway, a second fluid passageway, the same extending from the said chamber in a direction at an angle to the first passageway, a third fluid passageway connected to and leading from the second passageway at a point slightly removed from the chamber and being arranged with its axis approximately parallel with the axis of the first passageway but offset slightly therefrom, a valve in the third passageway adapted to control the flow of fluid therethrough, and a valve adapted to control the flow of fluid from the chamber to the said second passageway.

2. A gauge cock for steam boilers embodying a body having a portion thereof adapted for connection to the boiler, a passageway in said portion arranged for fluid communication with the boiler at one end thereof, a chamber formed at the other end of the said passageway, a second fluid passageway, the same extending from the said chamber in a direction at an angle to the first passageway and offset therefrom, a third fluid passageway connected to and leading from the sec-

ond passageway at a point slightly removed from the chamber and being arranged with its axis approximately parallel with the axis of the first passageway, an outlet from the third passageway to the exterior of the body, a valve in said third passageway adapted to control the flow of fluid therethrough, a valve adapted to control the flow of fluid from the chamber to the said second passageway, a cleanout opening in said chamber in axial alinement with the said first passageway, and a plug adapted to normally close said cleanout opening.

3. A gauge cock for steam boilers embodying a body having a portion thereof adapted for connection to the boiler, a passageway in said portion arranged for fluid communication with the boiler at one end thereof, a chamber formed at the other end of the said passageway, a second fluid passageway, the same being offset from the line of the first passageway and extending from the said chamber in a direction at an angle thereto, a third fluid passageway connected to and leading from the second passageway at a point slightly removed from the chamber and being arranged with its axis approximately parallel with the axis of the first passageway but offset slightly therefrom, an outlet from the third passageway to the exterior of the body, a valve in said third passageway adapted to control the flow of fluid therethrough, a valve adapted to control the flow of fluid from the chamber to the said second passageway, a cleanout opening in said chamber in axial alinement with the said first passageway, and a plug adapted to normally close said cleanout opening, said cleanout opening being located to one side of the said valve that controls the flow of fluid from the chamber.

4. A gauge cock for steam boilers embodying a body having a chamber therein, a passageway adapted to connect said chamber with the cavity of the boiler, a second passageway extending from said chamber to the exterior of the body, the same being offset from the line of the first passageway and extending for at least a portion of its length at an angle thereto, a valve adapted to control the flow of fluid from the chamber to the second passageway, and a valve located in said second passageway adapted to control the flow of fluid therethrough.

5. A gauge cock for steam boilers embodying a body having a chamber therein, a passageway adapted to connect said chamber with the cavity of the boiler, a second passageway extending from said chamber to the exterior of the body, the same being offset from the line of the first passageway and extending for at least a portion of its length at an angle thereto, a valve located in said second passageway adapted to control the flow of fluid therethrough, and a cleanout opening in said body in line with the said first passageway.

6. A gauge cock for steam boilers embodying a body having a chamber therein, a passageway adapted to connect said chamber with the cavity of the boiler, a second passageway extending from said chamber to the exterior of the body, the same being offset from the line of the first passageway and extending for at least a portion of its length at an angle thereto, a valve located in said second passageway adapted to control the flow of fluid therethrough, and a valve in said chamber adapted to close off communication between the chamber and the second passageway.

7. A gauge cock for steam boilers embodying a body having a chamber therein, a passageway adapted to connect said chamber with the cavity of the boiler, a second passageway extending from said chamber to the exterior of the body, the same being offset from the line of the first passageway and extending for at least a portion of its length at an angle thereto, a valve located in said second passageway adapted to control the flow of fluid therethrough, and a valve in said chamber adapted to close off communication between the chamber and the second passageway, said valve being located in axial alinement with said second passageway.

8. A gauge cock for steam boilers embodying a body having a chamber therein, a passageway adapted to connect said chamber with the cavity of the boiler, a second passageway extending from said chamber to the exterior of the body, the same being offset from the line of the first passageway and extending for at least a portion of its length at an angle thereto, a valve located in said second passageway adapted to control the flow of fluid therethrough, a cleanout opening in said body in line with the said first passageway, and a valve adapted to close off communication from the chamber to the second passageway said valve being located out of line with said cleanout opening.

9. A gauge cock for steam boilers embodying a body having a chamber therein, a passageway adapted to connect said chamber with the cavity of the boiler, a second passageway extending from said chamber to the exterior of the body, the axis of the same extending for at least a portion of its length at an angle with that of the first passageway, a threaded opening from said chamber to the exterior of the body, a bushing threaded into said opening, said bushing carrying a valve extending axially therethrough and enterable therein from the interior face of the bushing but operable from the exterior thereof and adapted when moved inwardly of the chamber to close off communication between the chamber and the second passageway and when moved outwardly to seat against the interior face of the bushing and to form a fluid seal thereagainst, the said bushing and

its valve being arranged in axial alinement with a portion of the said second passageway, a service valve in the second passageway adapted to control the flow of fluid there-through, and a cleanout opening in said chamber in axial alinement with the first passageway and with its axis to one side of the axis of said valve.

10. A gauge cock for steam boilers embodying a body having a portion thereof adapted for connection to the boiler, a passageway in said portion arranged for fluid communication with the boiler at one end thereof, a chamber formed at the other end of the said passageway, a second fluid passageway, the same extending from the said chamber in a direction at an angle to the first passageway, a third fluid passageway connected to and leading from the second passageway at a point slightly removed from the chamber and being arranged with its axis approximately parallel with the axis of the first passageway but offset slightly therefrom, an outlet from the third passageway to the exterior of the body, a valve in said third passageway adapted to control the flow of fluid therethrough, a valve adapted to control the flow of fluid from the chamber to the said second passageway, a normally closed cleanout opening in said chamber in axial alinement with the first passageway, and a normally closed cleanout opening in axial alinement with the second passageway between the two valves.

In testimony whereof I affix my signature.

BERNARD COOK.