E. O'MALLEY.

VALVE.

APPLICATION FILED SEPT. 12, 1911.

1,141,882.

Patented June 1, 1915.

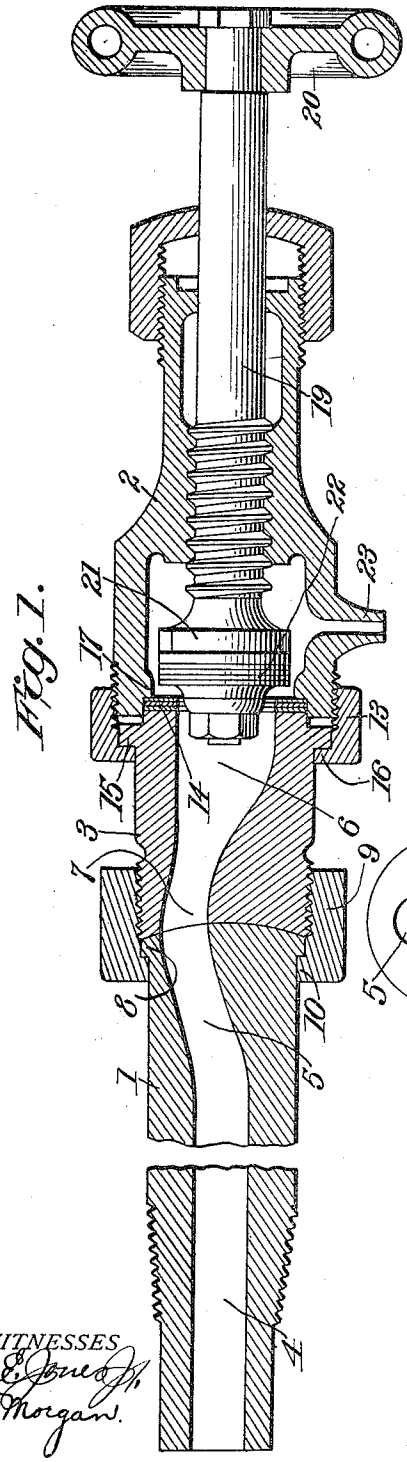


Fig. 1.

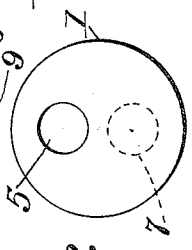


Fig. 3.

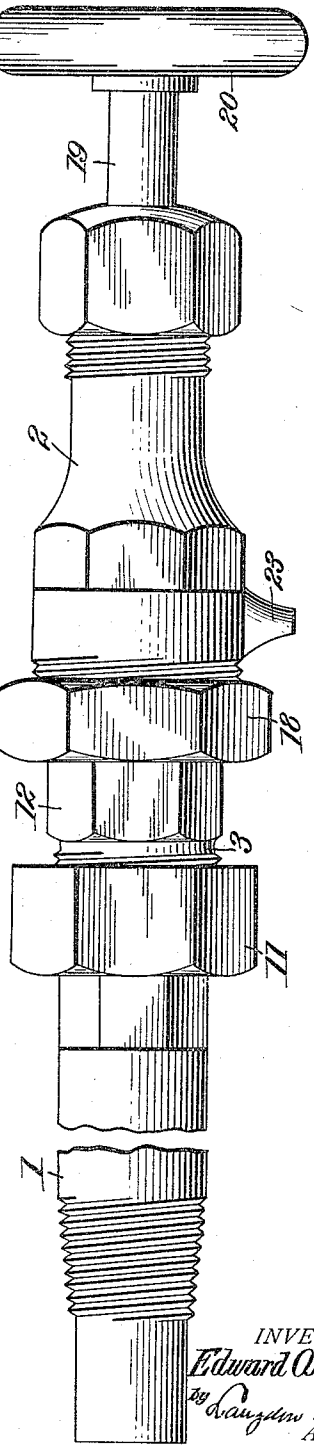


Fig. 2.

WITNESSES

M. E. Jones Jr.

C. Morgan.

INVENTOR,

Edward O'Malley.

by Langdon Morris.

Attorney.

UNITED STATES PATENT OFFICE.

EDWARD O'MALLEY, OF CHICAGO, ILLINOIS, ASSIGNOR TO O'MALLEY-BEARE VALVE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE.

VALVE.

1,141,882. Specification of Letters Patent. Patented June 1, 1915.

Application filed September 12, 1911. Serial No. 648,975.

To all whom it may concern:

Be it known that I, EDWARD O'MALLEY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Valves, of which the following is a specification.

This invention relates to improvements in valves, and more particularly to gage cocks for steam boilers.

It is the object of this invention to provide a gage cock for steam boilers with a double shut off, whereby the operating valve parts normally in communication with the boiler may be cut off and repaired without placing the boiler out of service and without the use of special tools. The advantages of such a gage cock are obvious. The greatest source of trouble, and in fact about the only source of trouble in the various systems of gage cocks in general use has been that the valve parts become leaky and defective due to the head and seat being cut or damaged by the action of scale or dirty water. It sometimes occurs that when operating a gage cock a large piece of scale or other obstruction becomes lodged on the seating surface making it impossible to close the valve and the result is obvious. To overcome such trouble and place the valve in working condition again heretofore it has been necessary to remove the damaged parts to regrind and replace it, or make other repairs to the inside of the valve, which necessitated the blowing down of the boiler before the work could be done.

This invention provides not only the independently cutting out of the operating parts of a gage cock valve from the boiler while in service, but also in addition a magazine of repair parts upon the head and seat, so that when the valve becomes leaky or damaged the valve is cut out and the damaged part removed and the next one in line will take its place or other repairs made inside the valve, and the valve then placed in service while the boiler is under full pressure. This gage cock is particularly adapted for use on locomotive boilers, which should be provided with three gage cocks, properly placed and not leaking and always in such condition that they can be easily operated.

While the preferred form of this invention is illustrated upon the accompanying sheet of drawing, yet it is to be understood that minor detail changes may be made without departing from the scope thereof.

Figure 1 is a view in central vertical section taken longitudinally through a gage cock constructed in accordance with this invention. Fig. 2 is a view in side elevation of Fig. 1. Fig. 3 is a view in transverse section through the boiler cut off union.

The gage cock as comtemplated in this invention consists of an externally screw threaded portion 1, adapted to engage the boiler walls, a valve cap 2, adapted to carry the valve stem and valve head, a valve seat base 3, adapted to connect the boiler engaging portion 1 to the valve cap 2, with means for securing the cap 2 to the seat base 3 and means for rotatably joining the seat base 3 to the boiler engaging portion 1.

The boiler engaging portion 1 is provided with an unobstructed central passage 4 which gradually diverges toward the outer end until the diverging passage 5 lies wholly without the center line where it abuts the adjacent seat base 3. The seat base 3 is provided with an unobstructed passage 6 which gradually decreases in size until it is of the same diameter as the passage 4 in the boiler engaging portion and gradually diverges toward this portion until the diverging passage 7 lies wholly without the center line and is adapted to coincide with the adjacent diverging passage 5 in the boiler engaging portion 1.

The outer end of the boiler engaging portion 1 is preferably convex and the adjacent surface of the seat base 3 is correspondingly concave, so that the contacting surfaces at the union are curved. The boiler engaging portion 1 at its outer end is provided with an outstanding circumferential flange 8 and the adjacent portion of this seat base 3 is of corresponding diameter with circumferential screw threads adapted to be engaged by a securing nut 9. The securing nut 9 is provided with an internal annular flange 10 adapted to engage behind the flange 8 upon

the boiler engaging portion 1. The securing nut 9 is provided with a plurality of flat wrench engaging surfaces 11 and the seat base 3 is likewise provided with a plurality of flat wrench engaging surfaces 12, whereby the two parts may be rotatably connected or rigidly secured as desired.

The valve cap 2 is detachably secured to the seat base 3 by a securing nut 13 and retains between them a plurality of thin, flat, wearing surface plates 14 similar in construction to the plates described and claimed in my former Patent No. 978,930. The outer portion of the cap 2 adjacent the seat base 3 is screw threaded to receive the securing nut 13. Near the adjacent end of the seat member 3 an outstanding circumferential flange 15 is provided and the securing nut 13 is provided with an internal annular flange 16 adapted to engage the under side thereof for securing these parts together. Near the adjacent extremity of the inner walls of the cap 2 an inwardly projecting annular seat engaging shoulder or flange 17 is provided. The outer end of the seat base 3 beyond the flange is reduced in diameter to be received within the walls of the cap 2. The walls of the seat base at this point are of sufficient thickness to act as a base for the seat plates 14. The securing nut 13 is provided about its circumference with a plurality of flat wrench engaging surfaces 18, whereby by the application of a wrench the cap 2 and seat base 3 may be drawn together and retain the seat plates 14 in place between them.

The cap 2 carries the valve stem 19, provided with the usual hand wheel 20, and a valve head 21. The valve head is preferably provided with a plurality of thin flat wearing surface plates 22 and is preferably constructed in the manner described and claimed in my said former Patent No. 978,930. A discharge opening and nozzle 23 is provided upon one side of the valve cap 2.

In order that the valve plates and seat plates may not rub against each other during the closing moments of the valve, it is preferable to mount the head 21 rotatably upon the stem 19, however, this is not necessary because the annular flange 17 upon the inner walls of the cap 2 is placed a sufficient distance from the end thereof so that when the ends of these walls engage the outer side of the seat base 3 a single seat plate will be rotatably held in place.

When a valve part gets out of order or the head or seat plates become worn, it is only necessary to detach the valve cap and remove the damaged plate and upon replacing the cap, the plate next in line will present a perfect contacting part. Should the valve head become stuck upon the stem a quick repair may be made by removing all of the head or seat plates but one and upon replacing the cap this one plate will be rotatably held in place. For the purpose of making these repairs to the gage cock without drawing the fires and blowing the boiler, the rotatable seat base and boiler engaging portions are provided with the diverging passages which in one position of the seat member form an unobstructed passage from the boiler to the valve and in a partially rotated position of the seat member, the operating parts of the valve are shut off from the boiler. It is important that the passageway diverges from the center line in a very gradual manner in order to prevent any confusing sounds during the operation of the valve that otherwise might be caused by an abrupt change in the course of the water and steam or by any obstruction in the course. Engineers mostly judge by the sound whether water, steam or a mixture of both are escaping from the gage cock. The sound by which a mixture of steam and water is known is fluttering. Any acute angle or obstruction in the passage will cause this fluttering sound, which would cause an error in the judgment of the amount of water in the boiler.

The gage cock described above makes it possible to test the level of the water in the boilers regularly without fear of the boiler being killed by failure of a valve to close. When the head or seat becomes worn, the damaged plates may be discarded and other repairs made within the valve without putting the boiler out of service. The operation is sure and positive and each gage cock is independent of all others. These features do away with the uncertainty of gaging the level of the water in the boiler, allow the boiler to be kept in constant service, and allow repairs to be made to the gage cocks while in service. All these things greatly reduce the uncertainties, dangers, and expenses of the use of gage cocks and add to the life and service of the boiler.

What I claim is:—

1. In a gage cock, a valve cap carrying a valve stem, valve head and a discharge nozzle, a seat base, a boiler engaging portion and means for rotatably connecting the seat base to the boiler engaging portion, the seat base and boiler engaging portion having a central passage gradually diverging from the center line having the crown of the divergence at the connection, with the passage at the crown entirely without the center line and the passageway from the crown increasing in diameter to the outer end of the seat base.

2. In a gage cock, a valve cap provided with a valve stem, valve head, discharge nozzle, and an internal annular flange upon the walls thereof, a seat base, a removable seat plate thereon, means engaging the seat

base and cap for adjustably securing the seat base to hold a plurality of seat plates against the annular flange, said means provided with a stop terminating the inward movement of the seat base a sufficient distance from the flange to allow a single seat plate to be rotatably mounted therebetween, a boiler engaging member rotatably engaging the seat base and a shut off formed at their jointure by the rotation of the seat base thereon.

EDWARD O'MALLEY.

Witnesses:
R. MORGAN,
JOSEPH E. LINDQUIST.

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