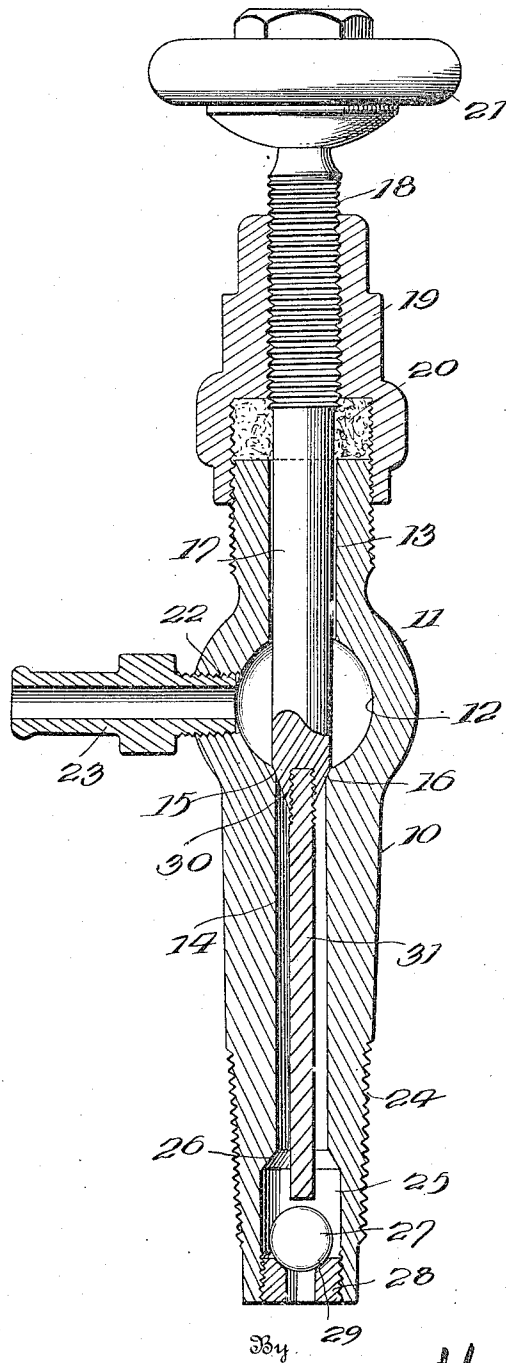


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AUTOMATIC SAFETY GAGE COCK.
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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE W. BOLTON, a citizen of the United States, residing at Nashville, in the county of Davidson and State of Tennessee, have invented certain new and useful Improvements in Automatic Safety Gage-Cocks, of which the following is a specification.

My invention relates to new and useful improvements in automatic safety gage cocks, the primary object of my invention being the provision of a gage cock including a manually operable valve and an automatic check valve so arranged that in ordinary use the automatic check valve is inactive and is held from its seat by the manually operable valve, and further so arranged that in case the valve casing becomes broken in such a manner as to displace the manually operable valve, the check valve will automatically move to active position to prevent escape of steam from the boiler.

A still further object of my invention consists in so arranging the valves that the manually operable valve may be moved to such an extent as to permit closing of the automatic valve under pressure of the steam in the boiler, after which the manually operable valve may be removed, the valve casing opened up, and the manually operable valve and its valve seat ground.

A still further object of my invention is to construct the valve casing in such a manner that that portion of it inclosing the automatic valve and forming a seat therefor is disposed within the boiler when the cock is in use. Because of this, even if the cock should be broken off flush with the outer face of the boiler, as might happen in a railroad accident or the like, the check valve would still be effective and prevent escape of steam and water from the boiler.

Another object of the invention is to provide a device having two distinct and independent valves with means whereby one valve can be disengaged from its seat and the other valve alone held closed or in operative position.

And a still further object of my invention is to simplify and cheapen the construction by doing away with all double or universal joints, springs and the like, such as are now commonly employed in safety gage cocks.

With these and other objects in view, my invention will be more fully described,

illustrated in the accompanying drawings, and then specifically pointed out in the claims which are attached to and form a part of this application.

The drawing is a central vertical sectional view of my improved automatic safety gage cock, showing the manually operable valve in closed position.

Corresponding and like parts are referred to in the following description and indicated in the drawing by the same reference characters.

My improved gage cock includes a valve casing 10 which is substantially cylindrical in shape, being enlarged at one point, as shown at 11, to provide a spherical valve chamber 12. The casing, at one end, is formed with a bore 13 opening into the chamber and at its other end with a bore also opening into the chamber, the latter bore being somewhat less in diameter than the former. The wall of the chamber, at the juncture of the chamber and smaller bore is beveled to provide a frusto-conical valve seat 15 to receive the frusto-conical valve carried by a cylindrical valve stem 17 fitting loosely in the bore 13. This stem adjacent its outer end is screw threaded, as shown at 18, to engage threads formed in a bonnet which is in turn threaded about the outer end of the valve casing 10, the bonnet being formed with an annular chamber about the valve stem to receive any suitable packing to prevent escape of steam about the stem. The outer end of the stem is provided with a hand wheel 21 or other suitable device by means of which it may be turned to move the valve 16 toward and away from its seat 15. A tapped outlet port 22 is formed in the side of the enlarged portion 13 of the valve casing to receive the threaded end of a nipple 23 by means of which the gage cock may be connected to the gage, not shown.

That end of the body 10, through which the smaller passage 14 opens, is preferably tapered and externally threaded, as shown at 24, for engagement in a tapped bore formed in a boiler head and the bore in the boiler head should be proportioned in such a manner that a considerable portion of the end of the valve casing will project into the boiler. The outer end of the bore 14 is enlarged to provide a check valve chamber 25, the wall of which, adjacent the bore 14, is beveled to provide a frusto-conical valve seat 26 for the spherical check valve 27 which

is mounted in the chamber 25. This check valve is held against escape from the chamber by a retaining ring or collar 28 which is threaded into the end of the chamber 25 and which is provided with a frusto-conical seat 29 which may receive the ball valve 27 and which, when so receiving it, will protect the valve from cutting. The valve 16 is formed in its end with a cylindrical threaded socket 30 and a rod 31 has one end threaded into this socket and its opposite end projected into the chamber 25 in spaced relation to the ball valve 27 when the latter seats upon the ring 28. The length of this rod or extension of the valve stem 17 should be such that in normal opening of the valve 16, the ball valve 27 will be held from its seat 26, this valve, of course, being forced from the ring 28 by steam or water pressure passing through the casing.

The rod 31 being threaded in the socket 30 can be adjusted longitudinally by unscrewing it to increase the distance between the valves sufficiently to cause the rod to engage the ball valve 27 and hold it positively upon the seat 29. Thus in event of the valve 16 becoming impaired or "leaking," the stem 17 with the rod 31 attached can be removed, the rod 31 lengthened as above described and the stem 17 restored to its position in the casing. The lengthened rod will cause the valve 27 to operate instead of the valve 16. Thus the valve 16 may be held entirely disengaged from its seat and the valve 27 only employed to hold back the steam or water pressure. This is an important feature of applicant's device and materially increases its efficiency and utility, specially when employed upon locomotives under high pressure and operating at a long distance from the repair shop.

In operation, the automatic safety gage cock is manipulated in the usual manner, the valve 16 being opened when the device is in use and the check ball valve 27 having no effect whatever. If, however, it becomes necessary to renew the packing 20 or remove the valve 16 for the purpose of grinding it or its seat, this may be done without putting the boiler out of service as the valve 16 may be opened to such an extent as to bring the rod 31 away from the valve seat 26 and so permit automatic seating of the ball valve 27 under steam pressure. The bonnet 19 may then be removed and the packing 20 renewed or, if the valve 16 and its seat 15 need to be ground, the extension 31 may be removed from the valve and both the valve 16 and its

seat ground, after which the extension may be replaced. The valve 16 then has its stem passed through the bonnet 19 again to a slight extent and the bonnet is again applied to the valve casing, after which the valve 16 may be brought to normal open position, at which point it will force the check valve 27 out of engagement with its seat.

As previously stated, the valve casing should project through the boiler head to such an extent that the check valve chamber 25 will be located wholly within the boiler. Under these circumstances, it will be apparent that in case of accident, even though the valve casing may be broken off flush with the outer face of the boiler head, all escape of steam and water from the boiler would be prevented by seating of the ball valve 27 against its seat 26.

Of course, any suitable materials may be employed in the construction of the various parts of the gage cock but I prefer to form the body of brass or equivalent material, the ball valve of phosphor bronze, and the extension rod 31 of steel. However, I do not wish to limit myself to any specific materials or to the exact details of construction and arrangement of parts illustrated and described, but reserve the right to make any changes within the scope of the appended claim without in the slightest degree departing from the spirit of my invention.

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

A safety gage cock, including a casing enlarged to form an outlet chamber and an intake chamber in spaced relation and connected by a passage and with an inlet passage leading into the intake chamber and a discharge leading from the outlet chamber, said connecting passage having valve seats at its juncture with the chambers and said inlet passage having a valve seat at its juncture with the inlet chamber, a valve stem having a terminal valve adapted to engage the seat of the outlet chamber, a valve freely movable within the inlet chamber and adapted to alternately engage the valve seats associated with the intake chamber, and a rod adjustably connected to the valve stem and extending into the path of the freely movable valve, said rod adapted to be extended to hold the terminal valve disengaged from its seat and to hold the freely movable valve positively engaged with the seat of the intake passage.

In testimony whereof I affix my signature.
 GEORGE W. BOLTON. [L. S.]