(No Model.)

G. BINDER.

GAGE COCK.

No. 517,426. Patented Apr. 3, 1894.

Fig: 1

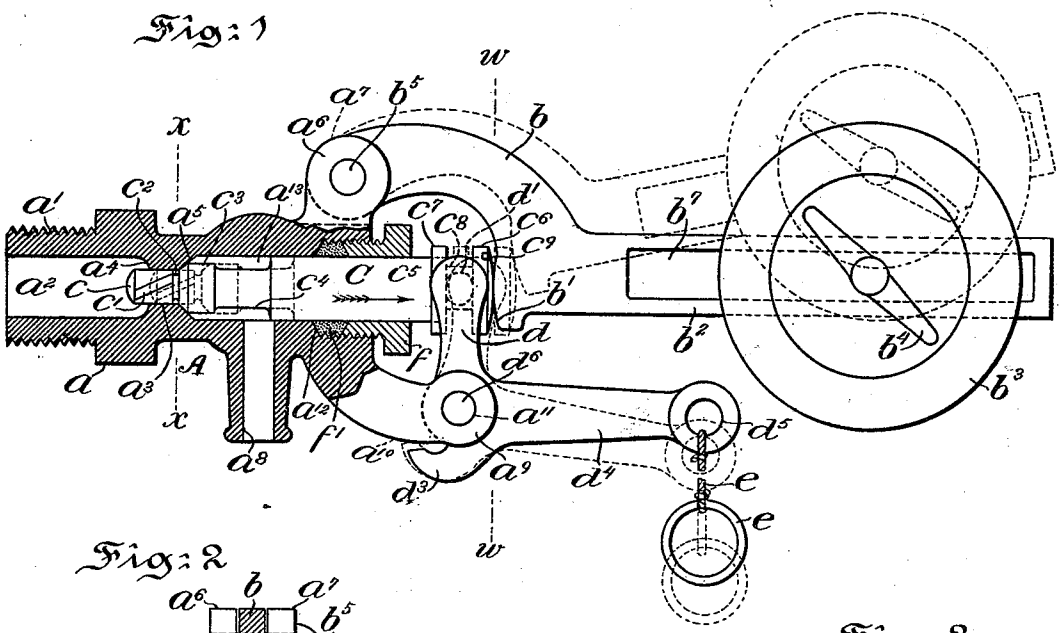


Fig: 2

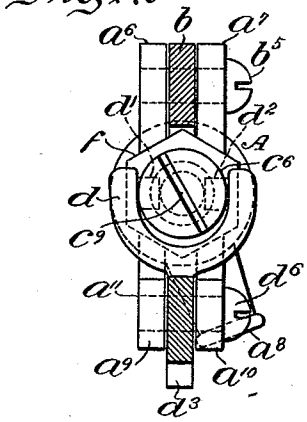


Fig: 3

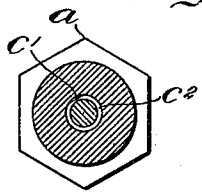
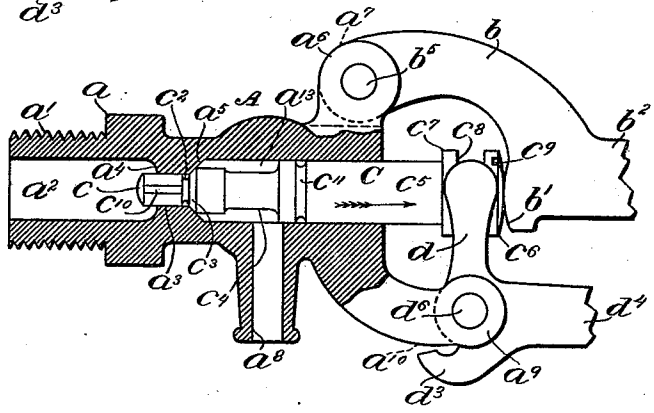


Fig: 4



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GAGE-COCK.

SPECIFICATION forming part of Letters Patent No. 517,426, dated April 3, 1894.

Application filed September 6, 1893. Serial No. 484,912. (No model.)

To all whom it may concern:

Be it known that I, GOTTLOB BINDER, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Gage-Cocks, of which the following is a specification.

My invention has relation to that class of appliances or attachments for steam-boilers designated as gage-cocks; and it relates more particularly in such connection to the general construction and arrangement of the parts thereof.

The principal objects of my invention are first, to provide a neat, simple, durable, inexpensive and efficient gage-cock for employment in connection with steam-boilers and the like; second, to provide a gage-cock having the parts thereof so arranged as to be maintained free from leakage; third, to provide a gage-cock so constructed and the parts thereof so arranged as that in the event of accidental leakage the same may be readily obviated with the least amount of time attending upon the grinding in of the valve thereof; fourth to provide a gage-cock so constructed and arranged as to be readily cleaned in the event of the accumulation of sediment in the bore thereof or of the valve becoming clogged with extraneous matter; fifth, to provide a gage-cock so constructed and arranged as to be adapted to varying pressures of boilers; sixth, to provide a gage-cock so arranged as to be adapted for employment as a vent in the filling of the boiler; seventh, to provide a gage-cock adapted for employment on boilers of different heights or dimensions and so arranged as to be susceptible of ready operation in connection with such types of boilers; eighth, to provide a gage-cock having the valve thereof positively controlled and so arranged as that perfect security is insured in the movement of the valve for permitting of the admission and exit of steam or of steam and water from the boiler; ninth, to provide a gage-cock so arranged as that the removal of sediment or other matter is permitted while the valve is under boiler pressure, through rotation of the valve-stem by a forked bell-crank lever provided with a stop for limiting the range of movement thereof; tenth, to provide a gage-cock with a contracted admission port, a rear tapering seat and a cylindrical stem-valve provided with a partially curve flat face forming a path to an annular groove formed in the stem for the passage of steam or steam and water from the boiler through the bore of the cock and with a tapering flange, an intermediate recess and a grooved cap or head engaged by a pivotally supported forked lever adapted to not only limit the range of movement of the valve but also to control the admission and discharge of steam or steam, water and extraneous matter, through the outlet port of the cock and so arranged as that leakage, clogging and jamming of the valve are entirely prevented; and eleventh, to provide a gage-cock having the parts thereof greatly simplified and the valve-stem provided with an annular groove forming a seal or means for receiving a suitable packing to prevent accidental leakage beyond the point of discharge of the steam or steam, water and extraneous matter in transit from the boiler to the outlet port of the cock.

My invention consists of a gage-cock, comprising a casting provided with an internal bore and an expansion chamber separated by an inlet or port, a valve provided with a grooved-cap, a pivotally supported forked lever engaging said grooved-cap and having a stop for controlling the extent of movement of the valve.

My invention further consists of a weighted gage-cock, comprising a casting provided with an internal bore and an expansion chamber with an interposed contracted inlet leading to said chamber and an outlet connected directly therewith, a complemental valve with a flanged and grooved stem engaged by a pivotal forked lever having a stop for limiting the range of movement thereof.

My invention further consists of a gage-cock, comprising a casting having two internal channels or chambers with a contracted interposed inlet having one end wall thereof made tapering to form a seat and an integral outlet port and cheek-pieces for the reception of a curved and channeled or recessed lever-arm provided with an adjustable weight and with a nose, lug or projection formed integral

therewith and curved wings pivotally supporting a forked lever provided with a stop and a complemental valve with a stem engaged by the forked portion of said lever.

My invention further consists of a gage-cock, comprising a casting provided with admission and expansion chambers separated from each other by a contracted inlet or port, a valve provided with a stem having a grooved cap, a forked-lever engaging therewith and provided with means for controlling the range of movement of said valve and a weighted pivotal lever normally engaging said valve.

My invention further consists of a gage-cock, comprising a casting provided with a threaded fitting with a flange or collar and an internal bore having a contracted inlet forming a seat for the cylindrical stem of a valve provided with a front partially curved flat face merging with an annular groove and a tapering flange or seat and the stem recessed intermediate of the grooved cap or head of the valve engaged by a forked lever which is pivotally connected with curved projecting wings of the casting and cheek-pieces pivotally engaged by a curved adjustable weighted channeled or recessed lever with an integral nose, lug or projection normally contacting with the cap or head of said valve; and my invention further consists of the improvements in gage-cocks, hereinafter described and claimed.

The nature and general features of my invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof, and in which—

Figure 1, is a central longitudinal section through a gage-cock embodying features of my invention. Fig. 2, is a cross sectional view on the line w—w, of Fig. 1, showing the construction and arrangement of the rear portion of the valve-stem and the mode of engaging the forked lever therewith. Fig. 3, is a similar view on the line x—x, of Fig. 1; and Fig. 4, is a central longitudinal section through a slightly modified form of gage-cock of my invention, with the gasketed stuffing-box of Fig. 1, omitted, and with an annular groove formed in the rear portion of the valve-stem for the reception of a suitable packing of water to form a seal, to prevent leakage of the valve of the cock.

Referring to the drawings A, is the casting provided with an external flange a, a tapering threaded surfaced fitting a', for insertion into the boiler head or surface, an internal admission bore or barrel forming a chamber a^2, a contracted inlet or port a^3, with a curved front surface a^4, and with a rear tapering surface a^5, forming a seat for the front portion of a stem-valve C, to be hereinafter more fully explained and with a steam expansion chamber a^{13}, located beyond and connected with the contracted inlet or port a^3.

a^6 and a^7, are cheek-pieces formed integral with the upper rear portion of the casting for the reception of a curved lever-arm b, provided with a nose, lug or projection b', and with a longitudinal extension b^2, channeled or recessed at b^7, for the reception of a slotted weight b^3, with a tightening-screw b^4. This lever-arm b, is connected with the cheek-pieces a^6 and a^7, by means of a pin or screw b^5.

a^8, is the outlet or port formed integral with the casting A, at substantially a right angle to the general plane thereof and directly connected with the expansion chamber a^{13}, of the cock.

a^9 and a^{10}, are integral curved wings provided with apertures a^{11}, for a purpose to be presently explained.

C, is a cylindrical stem-valve provided with a reduced front portion c, with a partially curved flat face c', merging with an annular groove c^2, a tapering flange or shoulder c^3, adapted to engage with the complemental seat a^5, and with a recess or reduced portion in cross-section c^4, a rear cylindrical portion c^5, and a cap or head c^6, with an integral flange or collar c^7, a recess or groove c^8, and a transverse groove c^9, in the cap or head c^6.

d, is a forked-lever provided with integral lateral pins d' and d^2, engaging the recess or groove c^8, of the valve-stem C, and having a stop d^3, and with a longitudinal extension d^4, provided with an eye d^5, for the reception of a cord or chain e, having a ring e', attached thereto. This forked lever d, is connected with the curved wings a^9 and a^{10}, of the casting A, of the cock by means of a pin or screw d^6.

f, is a stuffing-box or nut engaging the internal recessed portion a^{12}, of the casting A, as shown in Fig. 1, and so as to lightly seat or engage with the surface of the stem-valve C.

f', is a gasket of metal, leather or suitable material interposed between the front end of the recessed portion a^{12}, of the casting A, and the internal end of the stuffing-box f, in order to afford greater security to the cock in use, against leakage.

The gage-cock illustrated in Fig. 4, is the same as that illustrated in Fig. 1, with the exception that the gasketed stuffing-box f, is dispensed with and the valve stem C, is provided with a front, straight partially flat face c^{10}, and an annular groove c^{11}, which may be packed with suitable material such as leather or the like or water allowed to accumulate therein, in order to form as it were, a "water-seal" to prevent accidental leakage of steam from the rear portion of the cock between the cylindrical surface c^5, of the valve-stem C, and the internal portion of the steam expansion chamber a^{13}, of the casting A or the stuffing-box f, as shown in Figs. 1 or 4.

The mode of operation of the gage-cock of my invention and such as hereinbefore described, is as follows: It will be assumed that the cock is in either the position illustrated

in Fig. 1 or in Fig. 4, with the lever-arm b, having the adjustable weight b^3, arranged and secured by means of the tightening screw b^4, to the channeled or recessed portion of the lever-arm b, at such portion thereof as to adapt the cock to withstand the boiler pressure presented to the valve C, of the cock. In order to open the cock, the chain or cord e, attached to the forked lever d, by means of the chain or cord and carrying the ring e', is actuated to cause the rear portion of the stem-valve C, to be moved slightly in the direction indicated by the arrows in either Fig. 1 or Fig. 4, so as to permit steam or steam and water from the boiler to pass through the chamber a^2 of the cock A, then in the path of the flat face portion c', of the stem-valve around the annular groove c^2, over and between the tapering surfaced flange c^3, and inlet a^3, and the complemental seat a^5, of the casting A, into the steam expansion chamber a^{13}, in the barrel of the cock, around the recessed portion c^4, of the stem-valve C, and through the outlet or port a^8, of the casting. Upon the release of the hand in engagement with the ring e', of the chain or cord e, connected with the forked-lever d, the valve will again be closed by contact of the weighted-lever b, with the cap or head c^6, of the stem-valve C, and be maintained in such position against the pressure of the steam or steam and water from the boiler until again actuated to cause the valve by means of the lever d, and cord or chain e, to be opened in order to afford the steam or steam and water a free passage under due regulation from the boiler through the internal chamber a^2, the contracted inlet or port a^3, into the expansion chamber a^{13}, and thence downward and outward through the outlet or port a^8, into the air. In the filling of the boiler by simply opening the valve C, by drawing downward the cord or chain connected with the forked-lever d, the cock can be used as a vent in order to permit of the discharge of air from the boiler during such operation. In the event of sediment collecting around the internal walls of the chamber a^2 and a^{13}, the same may be readily loosened and blown off through the outlet port a^8, of the cock A, by simply applying a tool to the groove c^9, in the head or cap c^6, of the stem-valve C, and rotating the same around and around, while the valve is under boiler pressure and without any fear of the valve blowing out or of steam and water escaping from the rear portion of the cock as the range of movement of the lever-arm d, is controlled by the stop d^3, and consequently the same limits the range of movement of the valve C, and prevents any possible tendency of it to blow out or of the steam to escape from the rear of the cock. During the cleaning operation the lever b, will be caused to assume the position indicated in dotted lines in Fig. 1, as well as the forked-lever d.

Among the many advantageous features of the gage-cock hereinbefore described, may be mentioned the following:—First, the valve can be kept open, if requirements demand, by simply interposing a block between the levers b and d, as it were to prop the same, that is, slightly tilt both lever-arms at an angle to the position they respectively occupy in Figs. 1 and 4; second, the ease with which the valve of the cock may be operated that is, by means of the chain or cord e, connected with the forked lever d, the same is especially adapted for application to the highest portion or part of boilers without serious inconvenience or unnecessary time consumed in handling the cock in order to open and close the same; third, then it can be readily cleaned of sediment or other extraneous matter accumulating around and about the internal parts without removing the parts of the cock; and moreover, while under the normal boiler pressure, thereby saving much time and trouble; fourth, it is absolutely free from leakage or of any tendency to blow out which as important features of this cock render the same desirable for use in connection with steam boilers; and fifth, in the filling of a boiler by reason of the simplicity and ease of movement of the parts of the cock and the entire control of the valve operating devices thereof, the same is especially designed for and adapted to serve as a vent for the boiler to permit of the discharge of air therefrom.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A gage-cock, comprising a casting provided with an internal bore and an expansion chamber having an interposed inlet or port, a valve provided with a grooved-cap, a forked-lever engaging therewith and provided with a stop for controlling the range of movement of said valve, substantially as and for the purposes set forth.

2. A gage-cock, comprising a casting provided with two chambers separated by a contracted inlet or port, a valve provided with a recessed and grooved stem having a grooved-cap, a forked-lever with pins engaging therewith and the lever provided with a stop for limiting the range of movement of said valve, substantially as and for the purposes set forth.

3. A gage-cock, comprising a casting provided with two chambers having between them a contracted inlet or port and an outlet or port formed integral with the inner chamber, a cylindrical valve provided with a stem having a partially curved face merging into an annular groove and with a tapering flange recessed in rear and with a grooved cap or end, and a pivotally supported forked-lever provided with a stop for controlling the range of movement of said valve, substantially as and for the purposes set forth.

4. A gage-cock, comprising a casting, provided with internal chambers having an interposed inlet or port, a valve provided with

a stem having a recessed or grooved cap, a forked-lever engaging therewith and provided with means for controlling the range of movement of said valve and a weighted pivotal-lever normally engaging said valve, substantially as and for the purposes set forth.

5. A gage-cock, comprising a casting provided with internal chambers having an interposed inlet or port, a valve provided with means for engaging a forked-lever, and an adjustable weighted lever detachably connected with said valve, substantially as and for the purposes set forth.

6. A gage-cock, comprising a casting provided with internal-chambers, whereof one has a contracted inlet or port and whereof the other has a depending outlet or port, a stem-valve engaged by a forked lever provided with means adapted to control the range of movement thereof and a weighted pivotal-lever normally engaging said valve, substantially as and for the purposes set forth.

7. A gage-cock, comprising a casting provided with a threaded fitting and two internal chambers with an interposed inlet or port, an outlet or port and a forked-lever with a stop, substantially as and for the purposes set forth.

8. A gage-cock, comprising a casting having a flanged externally threaded fitting and internal chambers separated by a contracted inlet and with a depending outlet, a valve having the stem in contact with a gasketed stuffing-box, a forked-lever engaging said valve and arranged so as to limit the range of movement thereof and a weighted-lever detachably engaged by said valve, substantially as and for the purposes set forth.

9. A gage-cock, comprising a casting provided with two chambers separated by a wall provided with an inlet, a cylindrical valve provided with a stem having a partially curved flat face merging with a groove and a tapering flanged seat and a recess and a grooved-cap with a transverse groove and a pivotally supported lever provided with arms having pins adapted to engage and move in the grooved-cap of said stem, substantially as and for the purposes set forth.

10. A weighted gage-cock provided with a valve with a grooved-cap engaged by a pivoted bifurcated lever, substantially as and for the purposes set forth.

11. A gage-cock provided with a gasketed stuffing-box, inlet and outlet ports, a valve provided with a grooved-end engaged by the pins of a forked pivotal-lever for controlling the range of movement of said valve and an adjustable weighted pivotal-lever held normally in engagement with said valve, substantially as and for the purposes set forth.

12. A gage-cock provided with a contracted inlet-port and depending outlet-port, a valve having a stem adapted to engage the contracted inlet port and provided with a groove and the rear end of said stem flanged and grooved to engage pins of a forked pivotal lever and a pivotal lever provided with a weight detachably connected therewith, substantially as and for the purposes set forth.

13. A gage-cock, comprising a casting having a flanged tapering and threaded exterior fitting with an internal bore and contracted inlet leading to an expansion chamber provided with a depending outlet, a valve provided with a contracted recessed and grooved stem embraced by a pivotal forked-lever provided with a stop for controlling the range of movement of said valve and means for operating said lever, substantially as and for the purposes set forth.

14. A gage-cock, comprising a casting provided with cheeks having an adjustable weighted curved and channeled or recessed lever-arm connected therewith and provided with a lug or nose, a detachable stuffing-box engaging the recessed internal portion of said casting and cylindrical portion of said valve provided with a grooved-cap or head, a pivoted bifurcated lever having lateral pins engaging said cap, and said lever provided with a stop adapted to control the range of movement of said valve-stem, substantially as and for the purposes set forth.

15. A gage-cock, comprising a casting provided with a pivotally supported weighted adjustable channeled or recessed lever with an integral nose, lug or projection, a valve provided with a stem having in one portion thereof an annular groove and flanged so as to embrace a forked pivotal lever and means connected with said forked pivotal lever for operating the same and for limiting the range of movement of said valve, substantially as and for the purposes set forth.

16. A gage-cock, comprising a casting provided with a pivotally supported curved lever-arm with a projecting lug or nose and a longitudinal channeled or recessed extension carrying an adjustable weight, a gasketed stuffing-box, a valve with a stem having a grooved-cap engaged by the vertical forks of a longitudinal lever provided with pins and a stop, and means connected with said lever for actuating the same so as to limit the range of movement of said valve, substantially as and for the purposes set forth.

17. A weighted gage-cock, comprising a casting provided with an internal bore and an expansion chamber with an interposed contracted inlet leading to said chamber and an outlet connected directly therewith, a complemental valve with a flanged and grooved stem engaged by a forked-lever provided with a stop for limiting the range of movement thereof, substantially as and for the purposes set forth.

18. A gage-cock provided with an internal bore and an external threaded tapering and flanged fitting, a contracted inlet and a rear tapering wall and an expansion chamber provided with a depending outlet and with curved

wings pivotally supporting a bifurcated-lever with a stop and a rear extension provided with a detachable means for operating the same, a valve provided with a stem having a contracted partially flat face merging with a groove and a tapering flange recessed in rear thereof and merging with the cylindrical portion of said stem having a grooved-cap embraced by pins of said bifurcated-lever, and a pivotally supported lever carrying an adjustable weight normally engaging said valve, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

GOTTLOB BINDER.

Witnesses:
THOMAS M. SMITH,
RICHARD C. MAXWELL.