No. 806,970. PATENTED DEC. 12, 1905.

E. E. GOLD.

STEAM VALVE FOR TRAIN PIPES.

APPLICATION FILED JUNE 20, 1904.

2 SHEETS—SHEET 1.

FIG. 1.

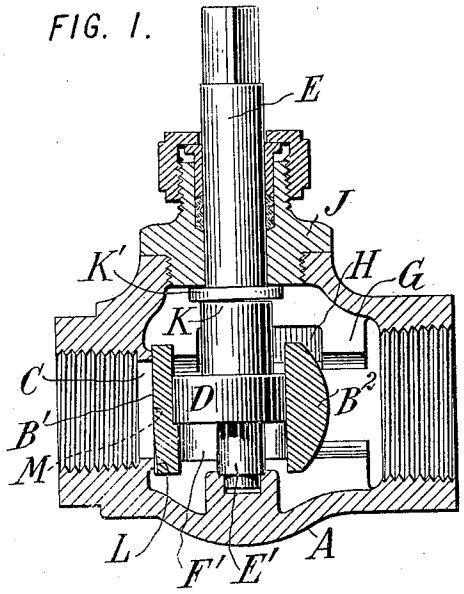


FIG. 2.

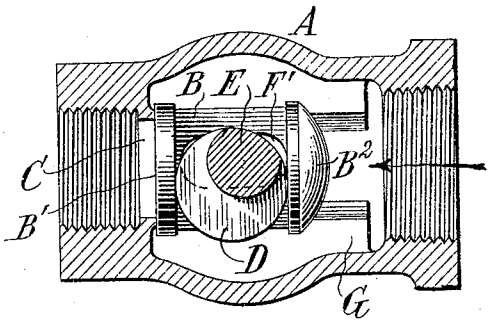


FIG. 3.

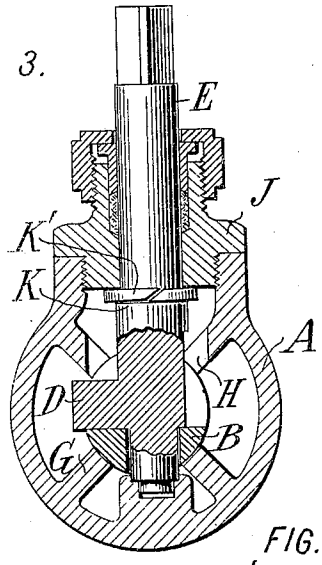


FIG. 4.

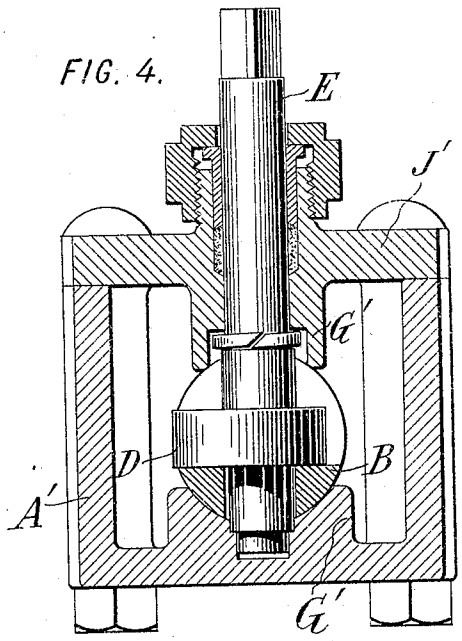
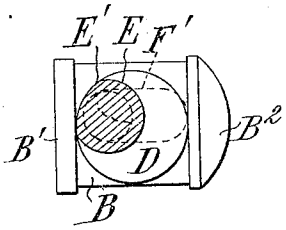


FIG. 8.



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2 SHEETS—SHEET 2.

FIG. 5.

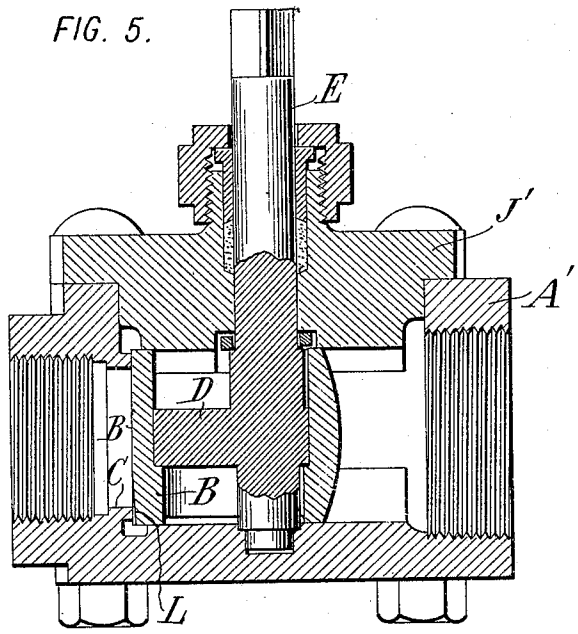


FIG. 6.

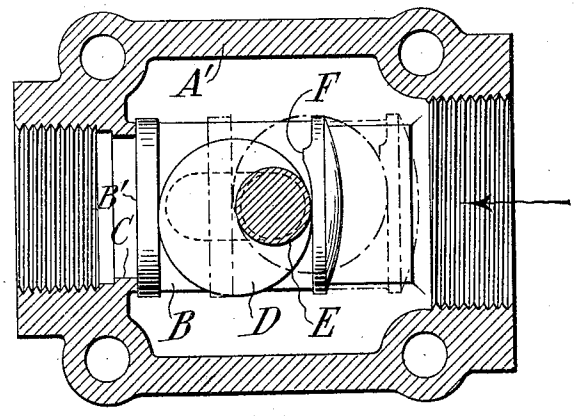
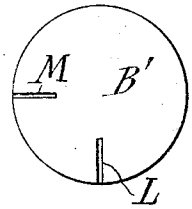


FIG. 7.



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UNITED STATES PATENT OFFICE.

EDWARD E. GOLD, OF NEW YORK, N. Y.

STEAM-VALVE FOR TRAIN-PIPES.

No. 806,970. Specification of Letters Patent. Patented Dec. 12, 1905.

Application filed June 20, 1904. Serial No. 213,429.

To all whom it may concern:

Be it known that I, EDWARD E. GOLD, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Steam-Valves for Train-Pipes, of which the following is a specification.

This invention aims to provide an improved valve especially adapted for use as an end valve on train-pipes.

According to one feature of this invention a very simple construction is provided by which the valve is held locked in the open position notwithstanding the constant steam-pressure tending to close it and assisted by the jarring of the train.

It is customary to drain the steam-pipe of a train through the valve at the rear end of the rear car, and for this purpose a small opening has been left near the bottom of the valve, through which the water of condensation could escape. However, in cold weather it is found that this water freezes as soon as it gets to the outside of the valve or in the flexible hose attached to the rear end of the train-pipe. This freezing injures the hose and stops up the valve, at least partially. In practice it is found that such passages for the escape of the water do not work very well. The trainman usually accomplishes the result better by leaving the valve slightly open. This is objectionable, however, because the trainman cannot tell with any degree of accuracy if the valve is open too much or too little. According to the present invention this difficulty is avoided by arranging the valve to close entirely and still permit the escape of water of condensation and of sufficient steam to keep the water from freezing adjacent to the valve or in the flexible pipe.

The invention provides also other improvements referred to in detail hereinafter.

The accompanying drawings illustrate embodiments of the invention.

Figure 1 is a longitudinal vertical section of a valve in the closed position. Fig. 2 is a horizontal section of the same. Fig. 3 is a transverse vertical section of the same. Fig. 4 is a transverse vertical section of a different embodiment of the invention. Figs. 5 and 6 are respectively a longitudinal vertical section and a horizontal section of the valve of Fig. 4. Fig. 7 is a face view of the valve-body. Fig. 8 is a view of the valve and eccentric of Fig. 2 in the open position of the valve.

The general construction of the valve illustrated is that of the well-known Gold train-pipe valve, (Patent No. 585,383, of June 29, 1897.)

The casing A is adapted to be connected to the train-pipe at opposite ends, and a valve-body B, preferably of the cylindrical form illustrated, is movable in the axial line of the train-pipe. A seat C is provided at one end of the casing, preferably the outer end, so that the valve shall close with the pressure, as indicated by the arrow in Fig. 2. An eccentric D or similar device engages the valve-body B and moves it toward or from its seat by the turning of the operating-spindle E. Figs. 1 and 2 show the valve in its closed position, and Fig. 6 shows the same in dotted lines in the open position. According to one feature of the invention the eccentric is arranged to turn in the direction to open the valve until it reaches or passes its dead-center—that is to say, the position in which the center of the eccentric and the center of the operating-spindle are substantially parallel with the longitudinal axis of the casing, as shown in dotted lines in Fig. 6. In this position the steam-pressure, which tends to always close the valve, has no leverage to turn the spindle, and therefore the valve is effectually locked in its wide-open position. Preferably in order to avoid movement of the eccentric entirely around or too far beyond the dead-center a stop is provided—such, for example, as a projection F, Fig. 6, on the valve-body. This projection permits the eccentric to turn until the valve-body is held in the desired open position intermediate between the openings at opposite ends of the casing. This stop, however, is not essential. The trainman may depend upon the position of the operating-handle on the spindle E to show when the valve is wide open, and a slight difference in the angular position of the eccentric makes no substantial difference in the position of the valve-body or in the locking effect referred to.

Instead of the projection F for limiting the movement of the eccentric far beyond the dead-center the guiding-slot F′ in the lower portion of the valve-body B may be so short that its left-hand end strikes the lower portion E′ of the spindle when the eccentric has approximately but not entirely reached its position of dead-center. The eccentric is sufficiently advanced to substantially lock the valve against closing movement. Fig. 8 shows the parts in the open position of the valve.

This is the preferred construction, because it provides substantially a quarter-turn of the operating-handle, and the trainman can throw the handle carelessly in either direction to the limit of its throw—that is, until the slot strikes the lower end of the spindle in the open position or until the valve strikes its seat in the closed position, Fig. 2.

The parts may be so proportioned that when the valve-body engages the seat C the eccentric will be in its position diametrically opposite the closing position, and thus mechanically lock the valve closed. Such a design is illustrated in Fig. 6. However, it is preferable to arrange the parts so that the spindle shall stand when the valve is closed in a position approximately transverse to that in which it stands when the valve is open, as in Figs. 2 and 8.

The valve-body preferably is slotted throughout its intermediate portion to permit the desired longitudinal movement relatively to the spindle and is entirely cut away in the plane of the eccentric D and above the same, leaving a face portion B′ for engaging the valve-seat and a rear portion B^2 for the engagement of the eccentric in opening the valve, said rear portion having a spherical outer face for guiding the steam gradually and without eddies to the sides of the valve-body and also for strengthening the latter. The valve-body reciprocates in guiding-ribs G, which may be of any desired number and which permit the passage of the steam around the valve-body. In the construction shown in Figs. 1, 2, and 3 a substantially globe-shaped casing A is used, the four ribs G being formed integrally with the substantially one-piece casing and the upper pair of ribs being slotted throughout a portion of their length, as indicated at H, to permit the insertion of the eccentric D. A cap or bonnet J screws into the top of the globe-shaped casing and carries the usual stuffing-box around the valve-spindle. The spindle is provided with a shoulder K immediately below the bonnet and by which the spindle is held down against the unbalanced upward steam-pressure, a spring-washer K′ being interposed. The casing, however, may be made in various other styles—as, for example, that illustrated in Figs. 4, 5, and 6. In this construction the casing A′ has a bottom and two substantially vertical sides made in one piece and carrying a central rib G′, and the cap J′ is bolted thereon and carries another rib G′, the two ribs G′ being of sufficient breadth to give the necessary lateral stability.

An important feature is the aperturing of the valve at vertically-separated points to permit the escape of a small quantity of water and steam separately when the valve is closed. For example, I may utilize for this purpose a pair of oblique grooves L M, formed in the edge of the face portion B′ of the valve-body. By using two of these grooves a quadrant's distance apart, as in Fig. 7, the lower groove permits the passage of water of condensation at the same time that the groove at the side permits the passage of steam. The position of the grooves L M at points which are both vertically and horizontally separate from each other—as, for example, at a quadrant's distance apart—has a special value in adapting the valve for use in either of the two usual positions—that is, with its spindle upright or with its spindle turned down and to the left, (as one faces the outer end of the valve.) In the second position the groove M will be at the bottom and will carry off the water, while the groove L will be half-way between the top and bottom and will carry off steam. This construction by permitting the passage of hot steam keeps warm the piping at the outer side of the valve, and thus prevents freezing and clogging of such piping without the necessity of nice regulation by the trainman. The provision of the passages described as well as other features of the invention are also applicable to the double-ended valves ordinarily used at the center of the train-pipe as substitutes for a pair of end valves, and indeed certain features of the invention are applicable to various types of valve.

Though I have described with great particularity of detail certain embodiments of the invention, yet it is not to be understood therefrom that the invention is limited to the specific embodiments disclosed. Various modifications thereof in detail and in the arrangement and combination of the parts may be made by those skilled in the art without departure from the invention.

What I claim is—

1. In a train-pipe valve, in combination, a valve-casing adapted to be connected to the train-pipe at opposite ends, a valve-body movable in the axial line of the train-pipe, a seat at one end of the casing, an eccentric for opening said valve and arranged to turn in the opening direction approximately to its dead-center, the valve-body being provided with a slot through which the eccentric-spindle passes and said eccentric and the length of said slot being shaped and proportioned to limit the movement of the eccentric to stop it substantially at the dead-center.

2. In a train-pipe valve, in combination, a valve-casing adapted to be connected to the train-pipe at opposite ends, an operating-spindle, a valve-body movable in the axial line of the train-pipe, a seat at one end of the casing, and an eccentric for opening said valve operated by said spindle and arranged to turn in the opening direction approximately to its dead-center to lock the valve against accidental closing and to close the valve by approximately a quarter-turn of said spindle from the open position.

3. In a train-pipe valve, in combination, a valve-casing adapted to be connected to the train-pipe at opposite ends, an operating-spindle, a valve-body movable in the axial line of the train-pipe, a seat at one end of the casing, an eccentric for opening said valve operated by said spindle and arranged to turn in the opening direction approximately to its dead-center to lock the valve against accidental closing and to close the valve by approximately a quarter-turn of said spindle from the open position, the movement of the eccentric being limited to prevent its going far beyond the dead-center.

4. In an end train-pipe valve, in combination, a valve-casing adapted to be connected to the train-pipe at opposite ends, a valve-body B movable in the axial line of the train-pipe, a seat C at one end of the casing, an eccentric D for opening said valve, a spindle E carrying said eccentric, said valve-body being provided with a slot F′ through which a portion of said spindle passes, the parts being proportioned to limit the opening movement of the eccentric approximately to its dead-center and to close the valve when the eccentric is turned a quarter-turn from the extreme open position.

5. In combination in a valve, a seat, a valve-body, an eccentric for reciprocating said body toward and from said seat, and a spindle for operating said eccentric, said eccentric being arranged to turn in the opening direction approximately to its dead-center to lock the valve against accidental closing and to close the valve by approximately a quarter-turn of said spindle from the open position.

6. In a train-pipe valve, in combination, a valve-casing comprising a single integral member having longitudinal guiding-ribs above and below the valve-body and integral with said casing, a reciprocable valve-body guided in said ribs, an eccentric for reciprocating said valve-body, and a cap for closing the top of said casing, the ribs above the valve-body being cut away to permit the introduction of the eccentric to its operative position.

7. In a train-pipe valve in combination, a valve-casing comprising a single integral member having longitudinal guiding-ribs G above and below the valve-body and integral with said casing, a reciprocable valve-body B guided in said ribs, an eccentric D for reciprocating said valve-body, a spindle E integral with said eccentric, and a cap J for closing the top of the casing and through which the spindle passes, the ribs above the valve-body being cut away to permit the introduction of the eccentric to its operative position.

8. A train-pipe valve apertured at vertically-separated points to permit the escape of steam and water of condensation separately when the valve is closed.

9. A train-pipe valve provided with a passage at the bottom and a passage above the bottom for the escape of water of condensation and steam respectively when the valve is closed.

10. A train-pipe valve apertured at vertically and horizontally separated points to permit the escape of water of condensation and steam separately when the valve is closed and when the valve-spindle is in either of two positions substantially at right angles to each other.

11. A train-pipe valve provided with grooves L and M at the bottom and side respectively.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

EDWARD E. GOLD.

Witnesses:
DOMINGO A. USINA,
FRED WHITE.