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UNITED STATES PATENT OFFICE.

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LOCOMOTIVE CHECK-VALVE.

1,354,440.

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To all whom it may concern:

Be it known that I, JOSEPH B. MOWRY, a citizen of the United States, and resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Locomotive Check-Valves, of which I hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

The objects of the invention are to provide an improved check valve construction for a locomotive, in which the valve is independent and automatically acting, and in which means are provided for regrinding the valve without removing it from the casing, the said means serving when desired to replace the valve onto its seat when it becomes caught away from its seat, and can not be replaced, without especial provision made for this purpose.

The invention includes an auxiliary check valve in the outlet opening leading from the valve chamber, and a downwardly projected outlet passage permitting the free opening of the valve and providing an outlet opening whose area of cross section equals or is greater than the area of the inlet opening of the main valve seat. This downward passage also prevents the deposit of scale or dirt in the valve casing.

The invention includes a rotatable stem provided with operating means for the valve and serving also as a guide therefor:

It includes adjustable supporting means for said stem and means for locking the stem in engagement with the valve, and in the raised position of the stem for leaving the valve free to operate automatically.

It includes a stationary stop for the main valve, limiting the movement, and an adjustable stop for the auxiliary valve.

It includes means for releasing the back pressure upon the main valve when it is desired to grind the same, the auxiliary check valve meanwhile holding back the back pressure upon the main valve.

The invention includes means for relieving the back pressure of the auxiliary valve upon the seat to enable it to be rotated upon its seat to grind the meeting surfaces.

It includes a valve casing having a vertical inlet opening, and a vertically operating main valve therefor, said casing having a downwardly inclined lateral outlet open-

ing and a vertically swinging auxiliary valve therein.

It further comprises the combination and arrangement of parts, hereinafter described, shown in the accompanying drawings and specially pointed out in the claims.

In the accompanying drawings Figure 1 is a vertical section of the device, Fig. 2 is a longitudinal section of an attachment for regrinding the auxiliary valve; Fig. 3 is a longitudinal section of the lower end of the grinding stem for the main valve.

In these views A, is the casing, B is the main check valve resting upon its seat C, through which the vertical opening D passes.

E is a vertically swinging auxiliary check valve positioned in a lateral outlet opening F, and pivoted at G above and in the rear of the valve seat H, to give a wide angle of opening.

The outlet passage I, leading from said seat is downwardly inclined to give a free unobstructed passage for the fluid, and when open the valve swings upward into its recess in the upwardly curved upper wall of said passage.

The auxiliary valve is formed in two portions, a valve disk E, and a hinged member E' through which the neck E² of the valve projects. The valve is secured by means of a pin or screw E³ which permits free oscillation of the valve to accommodate it to its seat, and an adjustable screw E⁴ limits the valve movement.

The device for regrinding the main valve is shown in Figs. 1, and 3, where J is a rotatable stem vertically mounted in the closure or screw threaded cap K which is secured in the opening K' in the upper wall of the casing.

The stem is provided with the vertical opening J² in its lower end, through which the neck B' of the valve B moves easily.

The valve B is provided with spaced, wedge shaped projections B², on its upper face, and the stem J is provided with laterally extending wedge shaped projections J', by means of which the projections B² on the valve are engaged to rotate the valve in its seat, for the purpose of removing scale and regrinding the valve and seat into perfect engaging surfaces.

The lower edges of the projections J' on the stem do not touch or mar the upper surface of the valve but are elevated above

the lower extremity J^3 of the stem J to avoid such contact.

The stem can be raised or lowered, and when raised as shown in Fig. 1, the valve
5 can rise and turn freely upon its seat under the influence of the water flow, but when the stem is brought down to engage the projections on the stem with those on the valve, the rotation of the stem will grind the valve
10 on its seat.

The stem J , is raised and held in raised position as shown in Fig. 1 by means of the cam shaped inner end of the lever L , which is pivoted to the upper end of the stem J .
15 The cam is raised by raising the outer end of the lever, and the stem can then be forced down by hand or the tap of a copper hammer, until the lugs J' engage the lugs or projections B^2 upon the valve, then by revolving the lever L , and stem J , the valve can be rotated on its seat and be ground thereon to a perfect fit. When the cam is moved to raise the stem J , it rests upon a screw threaded cap M adjustable at K^2 upon
25 the closure K , this cap serves for adjusting the gland N of the stuffing box.

The cap M forces the gland down, but a slight rotation of the cap M so as to move it upwardly will lock the stem in raised position.
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By means of the lever and cap the stem can be raised into air and water tight contact at S with the seat S' upon the closure so that no leak or loss of pressure will be caused where the stem enters the same.
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The cap is rotated by means of the lever M' . A tool such as shown at P can be inserted through an opening O^2 in the casing and by means of the forked end P' the auxiliary valve E can be rotated upon its seat to regrind the same.
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The tool P is provided with a screw threaded bushing P^3 which is adjustable in the opening O^2 , and bears against a shoulder P^4 upon the tool and can be adjusted to overcome the pressure of the auxiliary valve against its seat, so that the valve can be rotated against back pressure.
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When the tool is not in use the opening O^2 is preferably closed by means of the casing of a pet cock O which is used to relieve back pressure on the main valve when regrinding the same.
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The auxiliary valve serves an important function in closing automatically when the main valve is to be ground, and the injector is shut off to permit the regrinding of the main valve, since the steam pressure may rise to 200 lbs.
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Having described the invention what I claim as new and desire to secure by Letters Patent is:

1. In a check valve for use with steam at high pressure, in combination, a casing, a
65 valve seat therein having a vertical opening

and independent vertically movable main valve for said seat, said casing provided with a lateral opening, an auxiliary swinging check valve therein, a vertically movable device at the upper end of said casing adapted in its lower position, to engage and rotate said main valve, means for raising and for locking said device in inoperative position, said auxiliary check valve serving to prevent back pressure upon said main valve when said valve rotating device is in use.
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2. In a check valve for steam or other fluids under pressure, a casing having inlet and exhaust openings, a main check valve in the inlet opening, an auxiliary check valve in the outlet opening, a valve engaging device passing through the wall of said casing and engaging said main valve, said casing provided with an opening in alignment with said main valve, a closure for said opening in which said valve engaging device is rotatable and also longitudinally movable, a screw cap upon said closure, and a cam lever pivoted upon the outer end of said valve engaging device said cam lever engaging said screw cap.
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3. In a steam-check valve the combination with the casing and main valve, of a vertically swinging rotatable auxiliary check valve, a device for rotating the main valve upon its seat, and a separate device alternately usable therewith for rotating said auxiliary valve upon its seat.

4. In a steam check valve, the combination with the casing and main valve, of a vertically swinging rotatable auxiliary check valve, a device for rotating the main valve upon its seat, and a separate device alternately usable therewith for rotating said auxiliary valve upon its seat, said casing provided with openings respectively axial to said valves, and closures for said openings.
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5. In a check valve, in combination, a casing provided with inlet and outlet openings and with an opening in its outer wall alined with said inlet opening, a valve in said inlet opening, a closure in said alined opening, a stem rotatable and longitudinally movable in said closure, means upon said stem for detachably engaging, and rotating said valve when in its lowered position, a screw cap upon said closure, and a cam lever pivoted in said stem, engaging said cap for raising said stem, said cap serving as a locking means for said lever.
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6. In a regrinding device for a check valve, in combination with a valve casing having inlet and outlet openings and having an opening in its outer wall in axial line with said inlet opening, a valve in said inlet opening, a closure in said outer axial opening, a screw cap thereon and packing gland therein; a stem vertically movable and rotatable in said closure, packing gland and cap, projections on said valve and
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stem adapted to engage each other when said stem is lowered, a neck upon said valve and guide therefor in said stem, and an operating lever pivoted upon said stem and engaging said cap, said stem and closure provided with shoulders engaging each other when said stem is raised to form a fluid tight joint therewith. 15

7. In a check valve, in combination, a casing provided with vertical inlet and lateral outlet openings, a check valve in said outlet opening, a swinging support upon which said check valve is rotatably mounted, an outwardly and downwardly extending pas- 20

sage leading from said outlet opening in which passage said valve operates, and a pivot for said swinging support positioned above said outlet opening, said valve when opened rising into the upper part of said passage and permitting the free flow of fluid therethrough.

In testimony whereof I hereunto set my hand this 2nd day of August, 1917.

JOSEPH B. MOWRY.

In presence of—

WM. M. MONROE,
S. W. SANGSTER.