(No Model.) 2 Sheets—Sheet 1

H. BURNS.

CHECK VALVE.

No. 553,390. Patented Jan. 21, 1896.

Fig. 1.

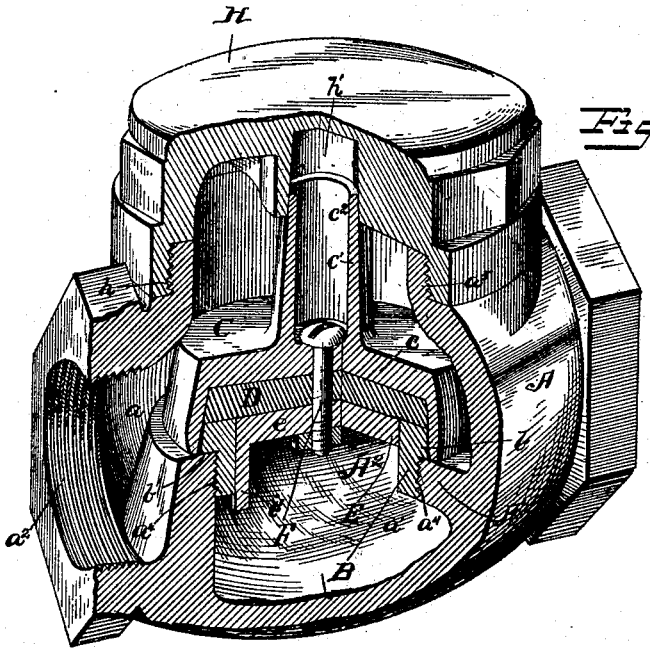


Fig. 5.

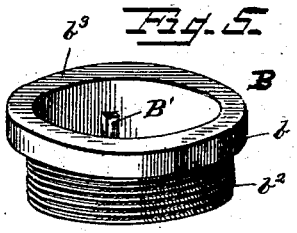
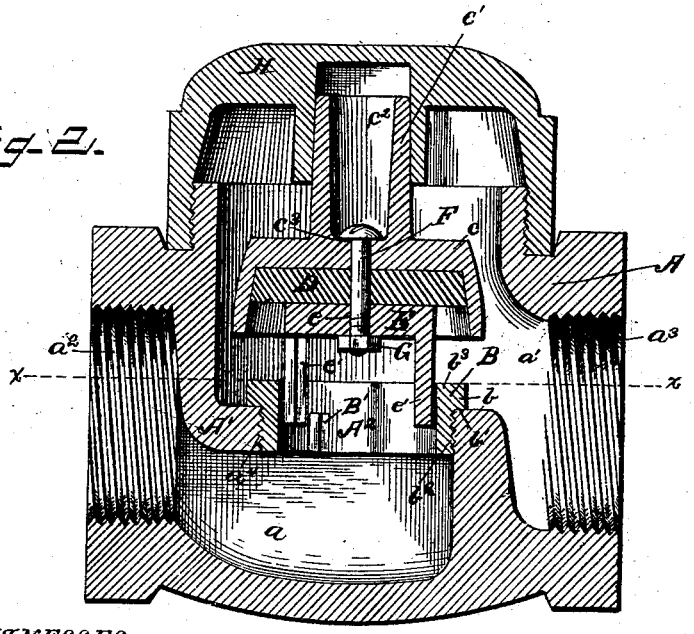


Fig. 2.



WITNESSES

Howard D. Orr.

N. O. Shepard.

INVENTOR

Henry Burns,

by J. R. Littell,

his Attorney

(No Model.) 2 Sheets—Sheet 2.

H. BURNS.

CHECK VALVE.

No. 553,390. Patented Jan. 21, 1896

Fig. 4.

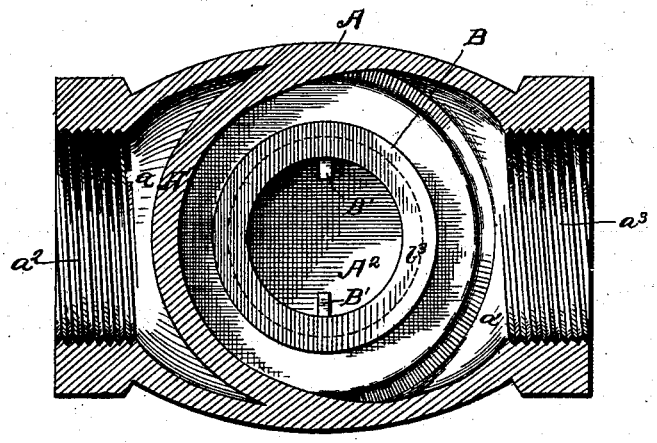


Fig. 3.

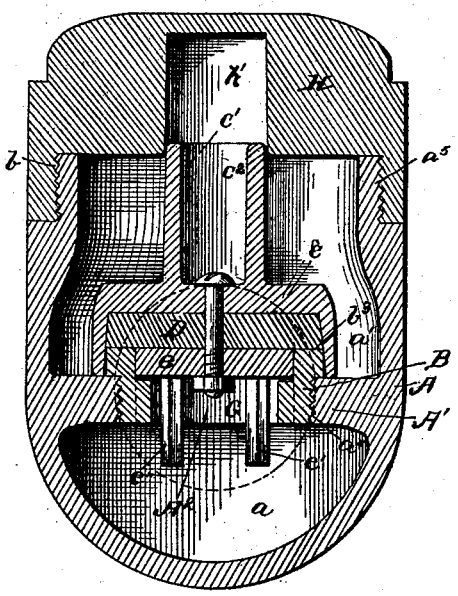
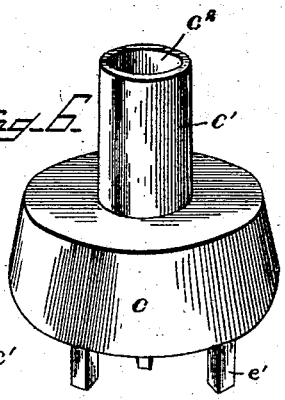


Fig. 6.



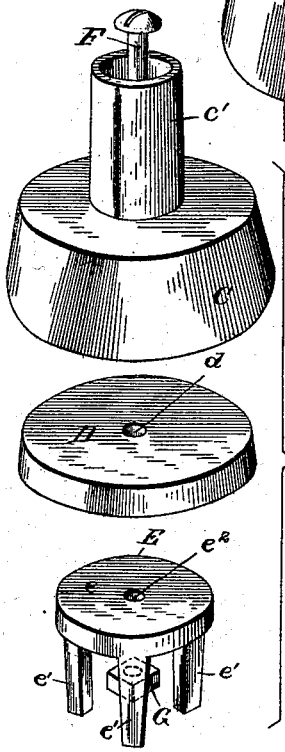


Fig. 7.

WITNESSES

Howard D. Orrs.

F. C. Shepard

Henry Burns,

INVENTOR

by J. R. Littell

his Attorney

UNITED STATES PATENT OFFICE.

HENRY BURNS, OF CHARLEVOIX, MICHIGAN.

CHECK-VALVE.

SPECIFICATION forming part of Letters Patent No. 553,390, dated January 21, 1896.

Application filed April 28, 1894. Serial No. 509,328. (No model.)

To all whom it may concern:

Be it known that I, HENRY BURNS, a citizen of the United States, residing at Charlevoix, in the county of Charlevoix and State of Michigan, have invented a new and useful Check-Valve, of which the following is a specification.

This invention relates to that class of check-valves which embody a shell or casing having an angular dividing-partition in which is formed the valve-seat, the valve being guided in its operation by a projecting stem working in the cap-piece or other part of the casing.

The object of my improvements is to provide a simple and inexpensive valve in which certain parts subject to wear may be readily and conveniently removed and others substituted, in which the size of the port of the valve-seat may be readily regulated, which is especially adapted by its construction and arrangement to be entirely formed of metal, and which will furthermore possess advantages in point of effective operation, adjustability, the substitution of parts, convenience, durability, and general efficiency.

To these ends my invention consists in certain improvements in the construction and arrangement of parts, substantially as hereinafter fully described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a perspective view of a check-valve embodying my improvements, parts being broken away to show the interior construction. Fig. 2 is a vertical longitudinal sectional view. Fig. 3 is a vertical transverse sectional view. Fig. 4 is a horizontal sectional view taken on the line $x\ x$, Fig. 2. Fig. 5 is a detail perspective view of the removable collar forming the valve-seat. Fig. 6 is a detail perspective view of the valve proper. Fig. 7 is a detail perspective view showing parts of the valve detached.

Corresponding parts in all the figures are denoted by the same letters of reference.

Referring to the drawings, A designates the shell or casing, which may be in the main of ordinary construction, having the angular dividing-partition A′ forming the inlet and outlet chambers a and a', respectively, with the respective inlet and outlet ports a^2 and a^3. In the horizontal central portion of the partition A′ is formed the valve-port A^2.

The walls of the port or opening A^2 are threaded, as shown at a^4, this threaded opening being adapted to receive a removable annular ring or collar B, forming the valve-seat. This ring or collar is provided with a circumferential flange b at its top, forming a shoulder b', below which latter the periphery of the ring is threaded, as shown at b^2. The threaded portion of the ring is received within the threaded opening A^2, with the shoulder b' resting upon the partition A′, so that the flange b forms a raised valve-seat, the top edge of the ring being preferably flat, as shown at b^3. The ring is provided with interiorly-projecting lugs B′ B′ adapted to be engaged by a suitable tool in setting or removing the ring, these lugs in the present instance projecting from the bottom about half-way up the wall of the ring to leave space for the accommodation of the guide-plate hereinafter described. I prefer to construct this removable ring of brass. The ring provides an effective valve-seat which may be readily removed when worn and another substituted, thus avoiding the substitution of an entirely new valve. The size of the valve-port may also be regulated as desired by employing different rings or collars of adapted thickness without changing the casing or shell.

C designates the valve proper, which comprises a cup or body portion c, adapted to fit over the raised valve-seat, and a projecting stem c'. I prefer to construct this piece of brass. In the cup c is set a disk or plate D, forming the washer and preferably constructed of white metal or brass. This washer rests upon the projecting top edge b^3 of the removable ring forming the valve-seat when the valve is closed.

E designates a guide-plate, which is preferably formed of brass and projects from the bottom of the valve proper, said guide-plate comprising a disk or body portion e, adapted to be received within the ring B and provided with downwardly-projecting studs e', which slide within the ring and serve to guide the valve. The washer D and guide-piece E are secured in relative position and to the valve-piece C by means of a bolt or screw F, passing through an opening d in the washer and an opening e^2 in the guide-plate, the parts being held in position with the guide-plate

up against the washer by a nut G on the end of said screw. The stem c' of the valve is hollowed out or recessed, as shown at c^2, for the accommodation of the head of the screw or bolt, and in the bottom of said recess is provided an opening c^3 for the passage of said screw. The parts subject to wear and carried by the valve proper are thus readily separable for purposes of substitution, and the diameter or size of the guide-plate E is adjusted to the diameter of the valve-port in the removable seat-ring B, which may be employed.

The cap-piece H is adapted to screw over the corresponding open top of the shell or casing A, these parts being relatively threaded, as shown at h and a^5, and interiorly in the cap-piece is provided a vertical guide channel or recess h' corresponding to and adapted to receive the valve-stem c'.

The operation and advantages of my invention will be readily understood by those skilled in the art to which it appertains. By reason of the improved construction and arrangement of parts, as above described and illustrated, the valve-seat and wearing parts of the valve may be readily removed and adjusted and substitution effected, and the size of the valve-port may be conveniently and inexpensively regulated with relation to the same casing or general parts. I prefer to construct the casing and cap-piece of brass or iron, and it will thus be noted that the entire valve is adapted to be formed of metal.

It will be understood that the removable ring or collar forming the valve-seat and the general features of construction and arrangement of the washer and parts of the valve proper are adapted for effective employment in valves of other general structure and arrangement as well as for check-valves.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. An improved check-valve, comprising the cup-shaped body portion, C, the flat disk or washer plate, D, corresponding to the interior of said cup and set therein, the guide-plate embodying a disk or body portion resting against the bottom face of the washer disk and provided with the downwardly-projecting studs e', and the bolt passing through the cup and the body of the guide-plate and binding the washer disk in position between the bottom face of the cup and the guide-plate, whereby the annular edge of the cup is adapted to inclose the valve seat and the flat bottom face of the washer rests upon said seat, substantially as set forth.

2. An improved check-valve, comprising the cup-shaped body portion, C, and the projecting hollowed or recessed stem, the flat disk or washer, D, corresponding to the interior of the cup and set within the same against the bottom face of the latter, the guide-plate, E, embodying a disk or body portion resting against the bottom face of the washer disk D and provided with the downwardly-extending studs e', and the securing screw or bolt set within the hollowed stem and projecting downwardly through the cup and washer disk and body of the guide-plate and binding the washer disk between the bottom face of the cup and the guide-plate, whereby the annular edge of the cup is adapted to inclose the valve seat and the flat bottom face of the washer is adapted to rest upon said seat, substantially as set forth.

3. An improved check-valve, comprising the casing provided with a partition having the opening forming the valve port, and the removable ring or collar secured in said opening and provided at its top with the projecting flange b having the approximately flat or straight top edge b^3, in combination with the cup-shaped valve, C, having the flat disk or washer, D, corresponding to the interior of the cup and set up within the same, and the guide-plate, E, embodying the disk or body portion seated against the washer disk and the downwardly-projecting studs e', the outer annular edge of the cup being adapted to inclose the flange b with the flat bottom face of the washer resting upon the top edge b^3 and the guide-plate and its projecting studs being received by the valve seat ring, substantially as set forth.

4. An improved check-valve, comprising the casing having the partition in which is provided the opening forming the valve port, the removable ring or collar secured in said opening and having at its top the projecting flange b provided with the top edge b^3, the valve embodying the cup-shaped body portion and the hollowed or recessed stem and carrying the flat disk or washer, D, corresponding to the interior of the cup and set up within the same, the guide-plate, E, having the disk or body portion seated against the bottom face of the washer and the downwardly-extending studs e', and the bolt set in the hollowed stem and passing downwardly through the cup and the washer and the body of the guide-plate and binding the washer disk between the bottom face of the cup and the guide-plate, the outer annular edge of the cup being adapted to inclose the flange b with the bottom face of the washer interiorly resting upon the edge b^3, substantially as set forth.

5. An improved check-valve of the class described, comprising the casing having the partition in which is provided the opening forming the valve port, the ring or collar set in said opening and provided at its top with the projecting flange b and having the interior projecting lugs B′ extending a part of the way up the wall of the ring, the cup-shaped valve carrying the disk or washer corresponding to the interior of the cup and set up within the same and adapted to rest upon the top edge of the flange b, and the guide-plate embodying the disk or body portion set within the cup against the bottom face of the washer and

provided with the downwardly-extending studs e' received by the valve seat ring, the outer annular edge of the cup being adapted to inclose the flange b while the disk or body portion of the guide-plate is received within the valve seat ring above the lugs B', substantially as and for the purpose set forth.

6. The herein-described improved check-valve, comprising the casing having the partition in which is provided the opening forming the valve port, the removable ring or collar secured in said opening and provided at its top with the projecting flange b having the approximately flat top edge b^3 and the interior lugs B' extending a part of the way up the wall of the ring, the valve embodying the cup-shaped body portion and the recessed or hollowed stem, the flat disk or washer D corresponding to the interior of the cup and set up within the same, the guide-plate E having the disk or body portion set within the cup against the bottom face of the washer and provided with downwardly-extending studs e' passing through the valve seat ring, and the bolt set in the recessed stem and passing downwardly through the cup and the washer and the body portion of the guide-plate, the outer annular edge of the cup being adapted to inclose the flange b with the body portion of the guide-plate received within the valve seat ring above the lugs B' and the flat bottom face of the washer D interiorly resting upon the top edge b^3, substantially as set forth.

7. An improved valve of the class described, embodying the casing provided with the opening forming the valve port, and a removable ring or collar secured in said opening and provided at its top with the projecting flange b, in combination with a cup-shaped valve carrying the disk or washer set up within the cup with its outer edge abutting against the outer annular edge of the cup, and guide devices set within the cup against the bottom face of the washer, the relative construction being such that the annular edge of the cup incloses the flange b between it and the guide devices and the intervening bottom face of the washer interiorly rests upon the top of the flange b, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY BURNS.

Witnesses:
H. S. HARSHA,
JOSEPH STEVENS.