

(No Model.)

F. A. PHILLIPPI.
CHECK VALVE.

No. 486,501.

Patented Nov. 22, 1892.

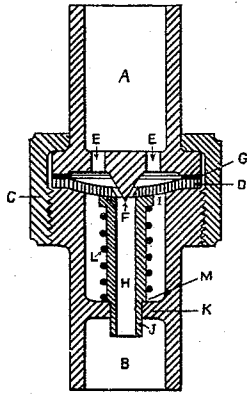


FIG. 1.

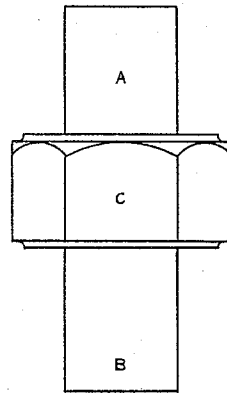


FIG. 2.

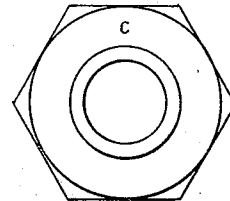
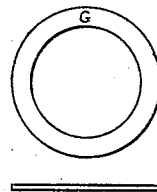
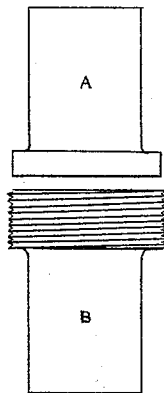
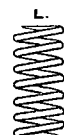
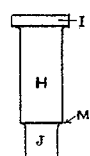
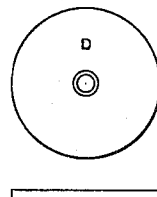


FIG. 3.



WITNESSES:

Chas. C. Collier.
Harry M. Hannick

INVENTOR

Frank A. Phillippi

BY

Chas. B. Collier,

ATTORNEY.

UNITED STATES PATENT OFFICE.

FRANK A. PHILLIPPI, OF PHILADELPHIA, PENNSYLVANIA.

CHECK-VALVE.

SPECIFICATION forming part of Letters Patent No. 486,501, dated November 22, 1892.

Application filed December 31, 1891. Serial No. 416,670. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. PHILLIPPI, a citizen of the United States, residing at Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Check-Valves, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a sectional elevation of this improved check-valve; Fig. 2, an elevation of the same, and Fig. 3 a top view. The other views represent in detail the different pieces of which the valve is composed, all of which will be hereinafter more fully described.

This improved form of check-valve has been devised to meet the particular requirements demanded in the furnishing of air to the carbureters used in lighting railroad-cars, the supply of air being taken under pressure from the air-receiving tanks as applied to the air-brake system.

It has been found in practice that a check-valve of ordinary construction is not sensitive enough, nor will those in common use close tight enough when the air-brakes are applied to prevent the carbureters being robbed of the air within them, and which is necessary to the maintaining of a proper light in the cars. Whenever the brakes are applied, there is a strong tendency for the air to rush toward the brake-cylinders from all sources where it may be stored. Each carbureter on the cars is directly connected with the general air-pipe system and comes in for a share of the sudden demand for air. Check-valves are placed between the carbureters and the main air-pipe line, to close when any attempt is made to withdraw the air from the carbureters. Now if these check-valves leak, as is invariably the case with those of ordinary construction, a perceptible dimming of the light within the cars will ensue, if not a total extinguishment. This valve is intended particularly to apply to this situation, and practical workings show it to be quite reliable and fitted to the service.

As will be seen by an inspection of the drawings and the different views there shown, there is nothing to distinguish this valve in external appearance from what is known as a "union-coupling." All the elements are there—the loose piece A, the male piece B, and

the coupling-nut C. The elastic washer D is also there; but instead of having the usual large hole in the center, affording a vent equal to the internal diameter of the connecting-pipes, only a relatively-small taper hole pierces the center of this washer. Certain other features have been introduced, turning the union into a check-valve of the most sensitive form, which will now be described. The loose piece A has a closed bottom through which are drilled any required number of small holes E E, and the end is pointed, as shown by F. The elastic washer or diaphragm D rests on the upper end of the male piece B, and a distance-ring G, of vulcanite or similar material, is placed between it and the loose piece A, so that the diaphragm D shall not close the small holes E E. Under the diaphragm D, which may be of rubber or its equivalent, there is a short tube H, having a collar I on its upper end. The lower end is turned to a smaller diameter J to work through a guide K, formed in the core of the male piece B, as shown. Between the guide K and the collar I of the central sliding tube H a small spiral spring L is interposed to force the tube upward and close the elastic-diaphragm valve D against the stationary valve-seat F.

The operation of the check is as follows: The fluid under pressure enters at A, passes through the openings E E, overcoming the resistance of the spiral spring L, and forces the diaphragm D from the valve-seat F, opening a passage through the central tube H for the fluid to pass on its way to the carbureter, receiving-tank, or other storage-receptacle. It will be noticed a limit is put to the opening movement of the diaphragm D by the shoulder M of the central tube coming in contact with the guide K, which gages the area of the opening to the central tube H and also relieves the diaphragm D from undue strain. When the pressure is relieved from A, the reaction of the spring L promptly forces the elastic diaphragm D into close contact with the valve-seat F, assisted by the back-pressure of the fluid under compression on the B side of the valve. While this sensitive form of check-valve has been devised for the special purpose herein mentioned, it will be found to be equally valuable and serviceable in any location or for any purpose where light press-

ures are carried and where unusual tightness of closing and proof against leakage are desirable. Instead of nut C a pair of flanges may be used, held together by bolts, without interfering with my invention, which is the part embraced between the loose piece A and the piece B, the manner of coupling together being a matter of convenience.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a check-valve, the loose piece A, having the openings E and the stationary valve-seat F, projecting from the loose piece A, combined with the male piece B, the yielding valve D, clamped between the adjacent ends of the pieces A and B, the central tube H, supported to engage the valve, and a spring to force the tube H and seat D toward the valve-seat F, substantially as described.
2. In a check-valve, a stationary valve-seat F, combined with a yielding valve D, a central tube H, supported to engage the valve D, and a spring arranged to force the valve D

into engagement with the seat F, substantially as and for the purpose specified.

3. In a check-valve, the loose piece A, having the openings E, the male piece B, having the interior guide K, and suitable devices to couple the two pieces together, combined with the stationary valve-seat F, projecting from the loose piece A into the piece B, the flexible valve D, clamped between the adjacent ends of the pieces A and B, the central tube H, supported in the guide K and engaging the valve D, and a spring interposed between the guide K and the valve D to force the latter into engagement with the valve-seat F, substantially as described.

In testimony whereof I have hereunto affixed my signature, in the presence of two witnesses, on this 20th day of June, A. D. 1891.

FRANK A. PHILLIPPI.

Witnesses:

GEO. W. REED,
CHAS. C. COLLIER.