(No Model.)

E. W. CRAINE.

CHECK VALVE.

No. 483,603. Patented Oct. 4, 1892.

FIG. 1.

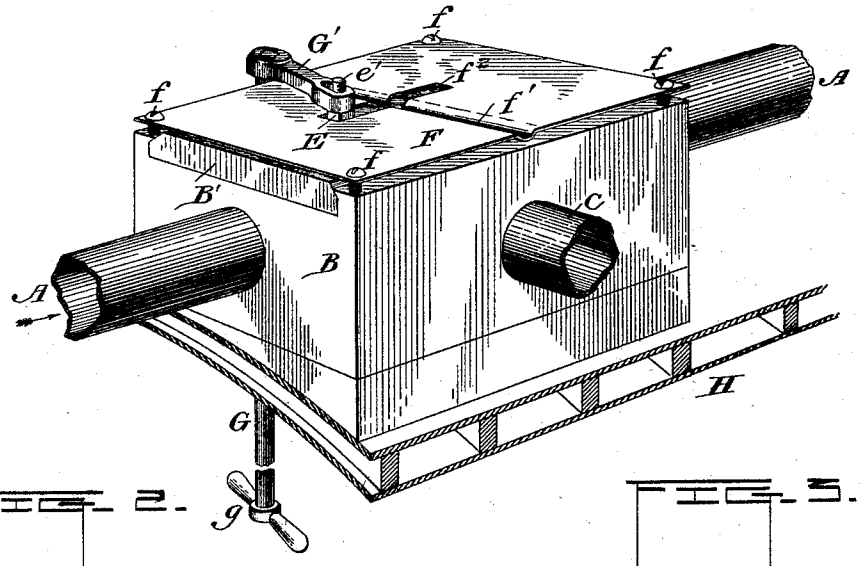


FIG. 2.

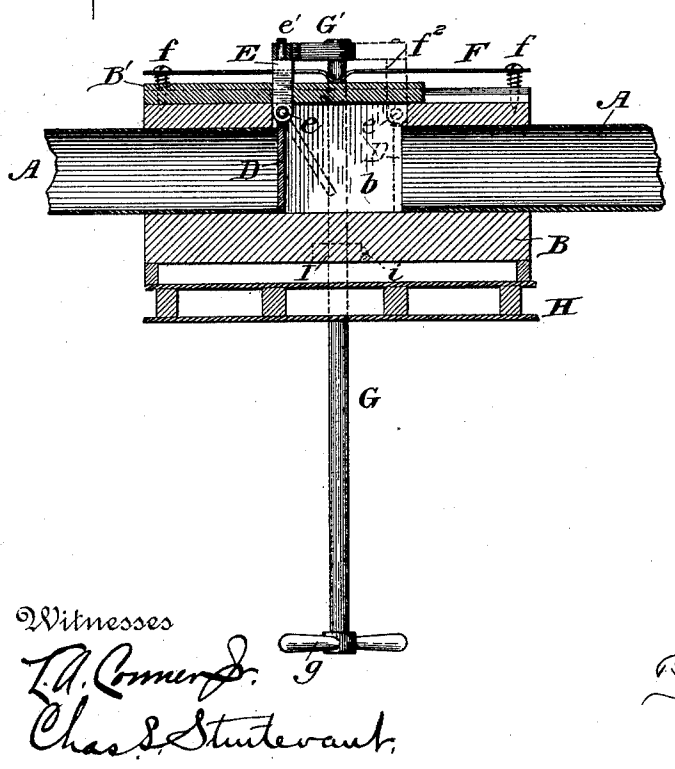
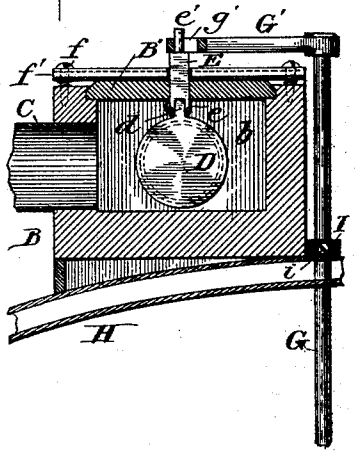


FIG. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

EDWIN W. CRAINE, OF MISSOURI VALLEY, IOWA.

CHECK-VALVE.

SPECIFICATION forming part of Letters Patent No. 483,603, dated October 4, 1892.

Application filed December 18, 1891. Serial No. 415,464. (No model.)

To all whom it may concern:

Be it known that I, EDWIN W. CRAINE, a citizen of the United States, residing at Missouri Valley, in the county of Harrison and State of Iowa, have invented certain new and useful Improvements in Check-Valves; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to valves for controlling the flow of fluids through conduits. It is applicable to many uses, but is especially valuable in pneumatic train signaling apparatus. Its object is to enable a current of fluid entering a main pipe from a branch pipe to be sent in either direction through said main pipe without interfering with the free passage of fluid through the entire length of the main pipe on each side of the junction of the branch therewith.

My invention consists, primarily, in the combination, with a main and a branch pipe, of a reversible check-valve located at the junction of the two pipes and controlling the adjacent openings of the main pipe.

In the drawings, Figure 1 is a perspective view. Fig. 2 is a vertical section through the axis of the main pipe, and Fig. 3 is a similar section through the axis of the branch pipe.

The main-pipe A is shown as composed of two sections entering and coupled by the body B, which, as shown, consists of a block of suitable material perforated to receive the ends of the main-pipe sections and containing a chamber *b* with which said pipes communicate. The pipes A are shown as arranged in line with each other; but it is evident that they may stand at an angle to each other, if desired. A branch pipe C also enters the chamber *b*, by which it is placed in connection with the main pipe A, so that fluid entering through the branch pipe has ready access to the main pipe.

In order to give the fluid the desired direction through the main pipe—as, for instance, toward the front of a railway-train for the purpose of operating a signaling-instrument in the baggage-car or engine-cab—a check-valve is arranged in the chamber *b*, adapted to close either one of the main-pipe sections. This valve is preferably made, as shown in Figs. 2 and 3, being a vertical flat disk D, faced, if desired, with leather or other suitable packing and hinged at its top to a slide, whereby it can be brought against the end of either of the sections of the main pipe, as indicated in dotted lines in Fig. 2. When thus placed, it prevents any flow of fluid from the chamber *b* to that section of the main pipe against which it rests, although it is free to lift and permit any fluid coming through that section to enter the chamber *b*. Consequently all fluid entering the chamber, either through that section of the main pipe or through the branch pipe must escape through the other section of the main pipe.

I prefer to use for the top of the chamber *b* a cover B′, rabbeted to slide in grooves *b′* and carrying a vertical stem E, rigidly held in an aperture in said cover. The lower end of the stem depends below the cover and to it is hinged the valve D, preferably by means of an ear *d*, fitted into a gain cut into the end of the stem and jointed therein by a pintle *e*. By sliding the cover B′ the valve is carried against one or the other of the main-pipe sections, the cover being long enough to keep the top of the chamber *b* always closed. The cover is held fluid-tight upon its seat by a suitable spring, preferably a steel plate F, secured to the body B by screws *f* and bearing upon the cover with a pressure adjustable by means of said screws. To concentrate the pressure at the best point, the plate is formed with a transverse corrugation *f′* about midway of its length, the corrugation being the only part of the plate in contact with the cover B′. Along the middle of the plate is a slot f^2 to permit the stem E to move.

In order to actuate the cover and reverse the valve from a distance, a lever or other suitable operating device may be connected with the stem. In the drawings a rock-shaft G is shown provided with a handle *g* and a rock-arm G′, having a slot *g′* to engage with the upper end of the stem E, which may have a cylindrical neck *e′* to enter the slot.

The rock-shaft or other operating device can be carried to any convenient point. When used on a railway-car, the body B can be

placed on the roof H of the car, the handle extending down into the body of the car, as shown. A collar I, adjustable by means of a set-screw *i*, enables the shaft G to be properly mounted.

My invention is applicable to conduits for conveying air, steam, gas, water, oil, and the like.

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

1. The combination, with a main pipe and a branch pipe, of a coupling uniting the same and containing a chamber, a sliding cover for said chamber, and a check-valve hinged to said sliding cover and adapted thereby to be brought against the end of the main pipe, substantially as described.

2. The combination, with the body B, containing the chamber *b*, of the pipes A C, entering said chamber, the sliding cover B′, the stem E, rigidly held in said cover, and the flap-valve D, hinged to the lower end of the stem, substantially as described.

3. The combination, with the body B, containing the chamber *b*, of the pipes A C, entering said chamber, the cover B′, rabbeted to slide in grooves in the body B and carrying a check-valve adapted to coact with the pipes A, and a spring bearing upon the cover B′, substantially as described.

4. The combination, with the chambered body B and the pipes A C, of the sliding cover B′, carrying the valve D, and the plate F, secured to the body B and having a transverse corrugation bearing upon the cover B′, substantially as described.

5. The combination, with the chambered body B and the pipes A C, of the sliding cover B′, stem E, held in the cover, the valve D, hinged to said stem, the slotted corrugated presser-plate F, and the rock-shaft G, connected with the stem, substantially as described.

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

EDWIN W. CRAINE.

Witnesses:
W. J. FLOYD,
E. S. GARRISON.