No. 610,470. Patented Sept. 6, 1898.

L. BUEHLER.

COMBINED CHECK AND STOP VALVE.

Application filed Apr. 15, 1897.

(No Model.)

FIG. 2.

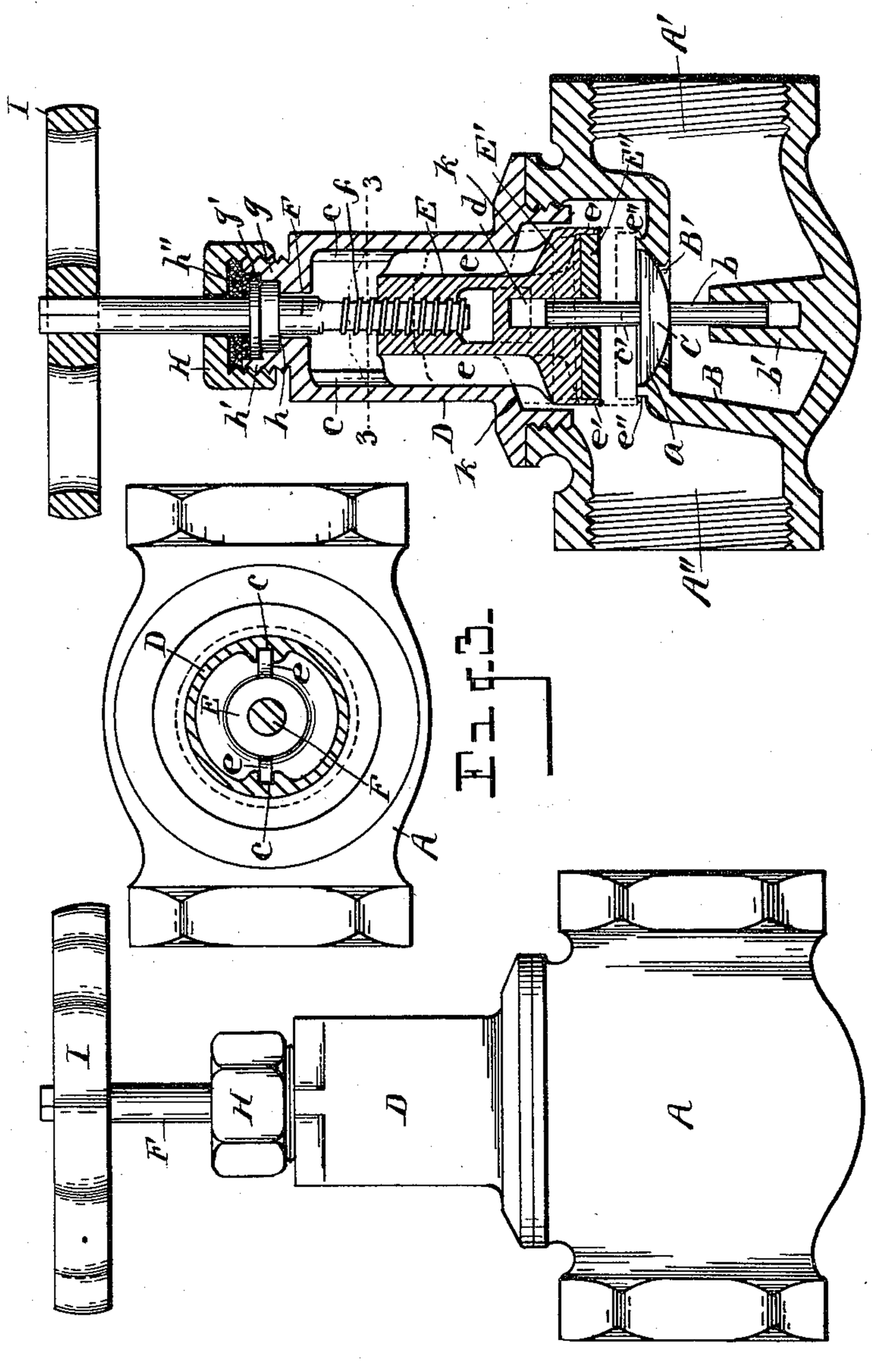

FIG. 3.

FIG. 1.

WITNESSES

O. B. Barrigar

Walter Barlow

INVENTOR

Louis Buehler

By F. B. Wheeler & Co.

Attys.

UNITED STATES PATENT OFFICE.

LOUIS BUEHLER, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF TO FRANK D. WHEELER, OF SAME PLACE.

COMBINED CHECK AND STOP VALVE.

SPECIFICATION forming part of Letters Patent No. 610,470, dated September 6, 1898.

Application filed April 15, 1897. Serial No. 632,203. (No model.)

To all whom it may concern:

Be it known that I, LOUIS BUEHLER, a citizen of the United States, residing at Detroit, in the county of Wayne, State of Michigan, have invented certain new and useful Improvements in a Combined Check and Stop Valve; 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.

This invention relates to new and useful improvements in combined check and stop valves; and it consists in the construction and arrangement of parts hereinafter fully set forth, and pointed out particularly in the claims.

The object of the invention is to produce a simple and effective valve which will permit of a free flow of steam or water therethrough and which will perfectly check any backflow and in which the arrangement is such as to enable the valve to be readily opened and closed and when closed render said closure absolute, permitting no passage of steam or water in either direction, which object is attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my improved valve. Fig. 2 is a central vertical section therethrough. Fig. 3 is a horizontal section on line 3 3 of Fig. 2.

Referring to the letters of reference, A designates the valve-case, which is provided with a dividing-diaphragm B, having a horizontal portion through which is formed the valve-aperture B′, surrounding which is the valve-seat *a*, said case being provided in its opposite ends with the induct and educt ports A′ A″.

C designates the check-valve, which is circular in form and provided with a convex under face. Said valve is adapted to close the aperture B′ through said diaphragm and normally lies upon the seat *a*. Depending vertically from the under face of said valve is a stem *b*, which enters and is adapted to reciprocate in a vertical tube or guide *b′*, projecting from the lower wall of said case and which serves to insure a perfect seating of said valve. Screwed into said valve-case and communicating therewith in line with the valve is a shell or hood D, having vertical ways *c* formed in the opposed inner walls thereof, as clearly shown in Fig. 3.

Extending vertically into the hood D is a plunger E, having upon opposite sides thereof the projecting wings *e*, which are adapted to enter and slide vertically in the ways *c*, formed in the wall of said hood, whereby said plunger is guided in its vertical movement. Upon the lower end of the plunger E is an annular disk E′, the under face of which is cupped and filled with a malleable metallic composition E″. The outer margin or flange *e′* of said disk is adapted when the disk is down to embrace the raised flange *e″*, surrounding the valve-seat *a*, as shown by dotted lines in Fig. 2, while the malleable metallic filling of said disk is adapted to bear upon the upper edge of said flange *e″* to effect a closure of the valve-opening, at the same time forcing the check-valve C to its seat, whereby a double closure of the valve-opening is effected.

The valve C is provided with a stem *c′*, which extends centrally from its upper face and lies freely within the aperture *d*, which passes centrally through the disk E′ and extends upward into the stem of said disk, whereby said valve is more perfectly guided in its vertical movement.

Passing through the upper end of the hood D is a stem F, the lower end of which is threaded, as at *f*, and is screwed into the upper end of the plunger E. Formed upon said stem F is an integral annular collar *g*, which bears upon the shoulder *h* within the externally-threaded stuffing-box *h′*, formed around the aperture in said hood through which said stem passes, said collar regulating the distance which said stem may enter said hood. Lying upon said collar is an annular washer *g′* of greater diameter than said collar, which is also embraced within the annular stuffing-box *h′*, and upon which is placed a packing *h″*, of asbestos or other suitable material, which is confined in place and forced downward upon said washer by means of the cap H, which is screwed upon said stuffing-box

h', and through which passes the upper end of the stem F. By this arrangement it will be seen that the stem F, while permitted to rotate freely in the stuffing-box, is freely held against vertical movement, and that the washer g', lying upon the collar g of said stem, is held from rotation, but permits said collar to rotate under it, thereby obviating any movement between the washer and the packing in the stuffing-box, whereby no leak can occur through the wear of said parts. I do not, however, depend entirely upon the packing in the stuffing-box to prevent a leak around the stem F when the valve is open, for the reason that when the disk E′ is raised by a rotation of said stem, as shown by dotted lines in Fig. 2, so as to engage the shoulder k of the hood, its further upward movement is arrested, so that a further rotation of the stem F will draw the collar g thereon downward upon the shoulder h, which forms a seat for said collar, thereby effectually preventing the passage of steam or water around said stem, enabling the cap of the stuffing-box to be removed when the valve is open without danger of causing a leak around the stem F.

Upon the upper end of the stem F is a hand-wheel I, through the means of which said stem may be rotated to raise and lower the plunger E and the disk E′, carried on the lower end thereof.

This improved valve may be placed at any point where the perfect control of steam or water of a high pressure is desired, and is especially adapted as a check-valve to place between an injector and the boiler.

In the operation of this improved valve when it is desired to open it the hand-wheel is revolved, so as to raise the plunger E and lift the disk E′ from the valve C. The pressure of the steam or water in the induct A′ will then raise the valve from its seat, permitting the passage of the fluid through the valve-aperture B′. The size of this aperture may be regulated by the distance which the disk E′ is raised above said valve, by means of which the movement of said valve is limited, as shown by dotted lines in Fig. 2. As long as the pressure in the induct-pipe is sufficient to raise said valve it remains open; but should said pressure fall said valve would immediately drop to its seat, making a perfect closure and preventing any possible backflow. When it is desired to close the valve, the hand-wheel is operated so as to carry the plunger downward, causing the malleable filling in the center of the disk E′ to close upon the ground upper edge of the plunger e'', surrounding the valve-aperture, and at the same time carrying the valve C to its seat, thereby making a double closure of the valve-opening and effectually stopping the flow of steam or water through said valve, even under the highest pressure.

Having thus fully set forth my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with the valve-case having the horizontal diaphragm provided with an aperture, the check-valve seated over said aperture and having a depending stem, the vertical tube in said case which receives said stem, the vertically-movable plunger carrying on its lower end a disk which engages said valve to regulate the vertical play thereof and to force said valve to its seat, said disk being of greater diameter than said valve and adapted to make a closure on the valve-seat around the valve's perimeter.

2. The combination of the valve-case, the check-valve seated therein, the raised flange around said valve-seat, the movable plunger adapted to engage said valve and having a bearing upon said raised flange to make a closure around the valve-seat.

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

LOUIS BUEHLER.

Witnesses:
E. S. WHEELER,
MARY A. MARTIN.