

**No. 620,287.**

**Patented Feb. 28, 1899.**

**D. B. DONNELLY.**

**BLOW-OFF COCK.**

(Application filed Oct. 18, 1898.)

(No Model.)

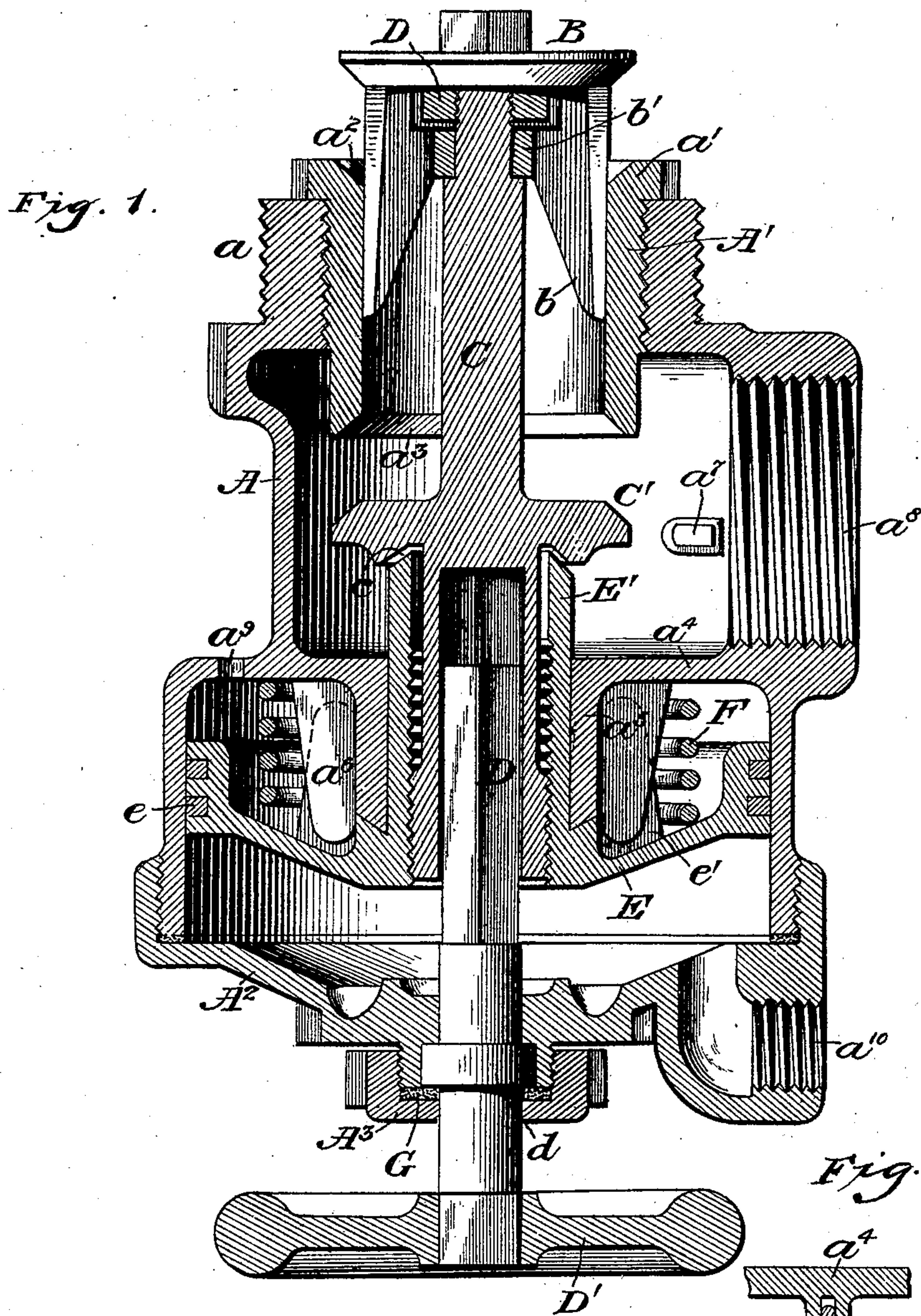


Fig. 3.

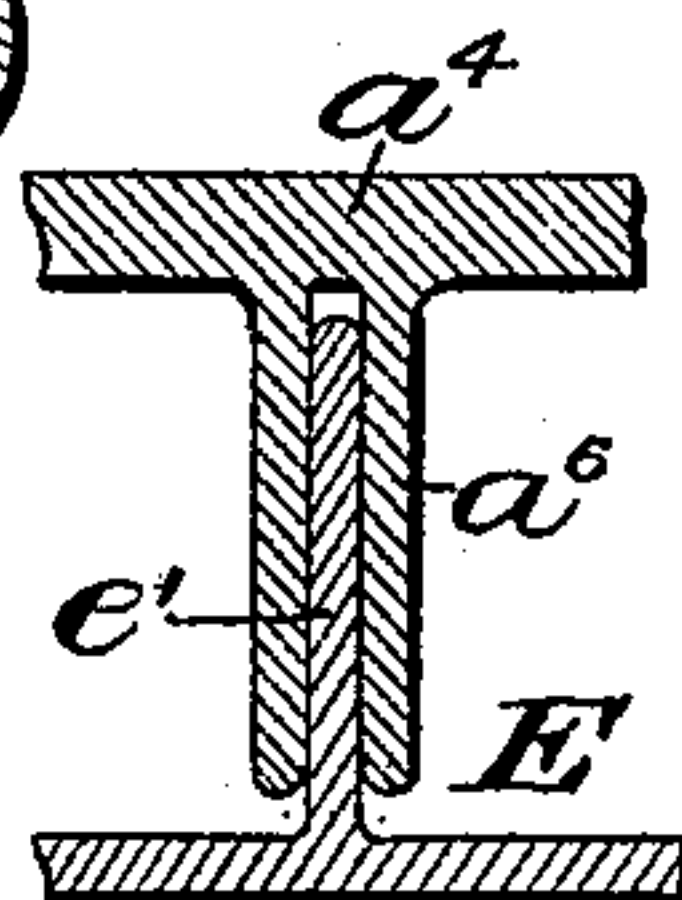
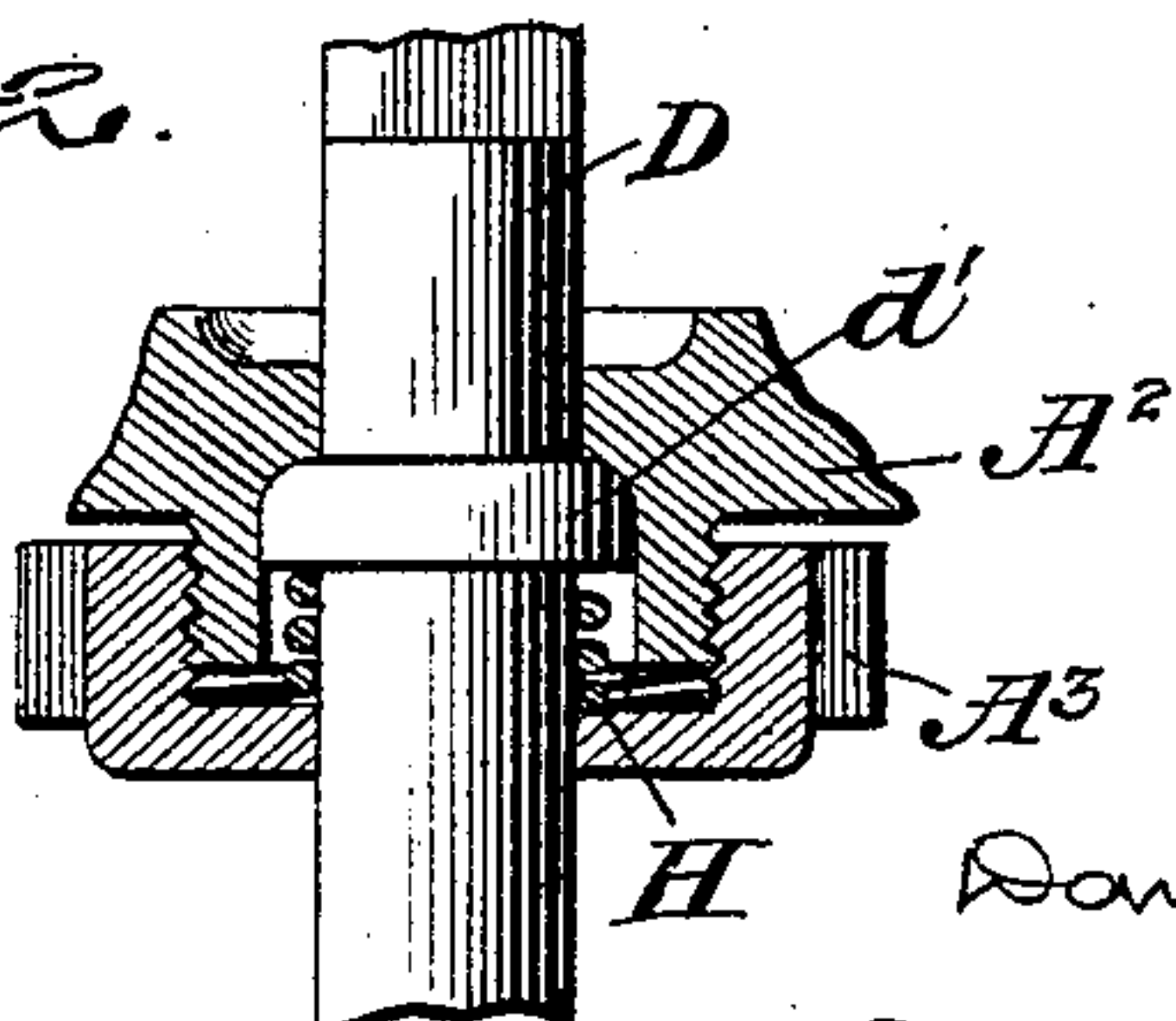


Fig. R.



**Witnesses.**

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# UNITED STATES PATENT OFFICE.

DANIEL B. DONNELLY, OF PITTSBURG, PENNSYLVANIA.

## BLOW-OFF COCK.

SPECIFICATION forming part of Letters Patent No. 620,287, dated February 28, 1899.

Application filed October 18, 1898. Serial No. 693,848. (No model.)

*To all whom it may concern:*

Be it known that I, DANIEL B. DONNELLY, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Blow-Off Cocks; 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 blow-off cocks for steam-boilers, and is an improvement upon the blow-off cock patented to me December 17, 1895, No. 551,370.

The object of the present invention is to provide means for both closing and opening the valve by hand without interfering with its free actuation by the fluid-pressure, and, further, to provide an auxiliary valve for closing the discharge-opening in case of accident to or clogging of the main valve.

In the accompanying drawings, Figure 1 is a longitudinal section of a blow-off cock embodying my improvements. Fig. 2 is a modification of one part, and Fig. 3 shows a detail of construction.

The casing A has at its upper end a screw-threaded neck  $a$  for attaching it to the shell of the boiler. At the outer and inner ends of the neck are valve-seats preferably formed on the ends of a removable bushing A', which has a flange  $a'$  abutting solidly on the end of the neck  $a$ . The valve-seats  $a^2$   $a^3$  are at each end of the bushing, the inner end of which projects into the casing, as shown.

The main valve B has wings  $b$  to guide it in the bushing. It seats upon the outer seat  $a^2$  and has a bridge  $b'$  on its underside, through which passes the reduced end of the valve-stem C. A nut D in the space between the bridge and the valve engages the threaded end of the stem, whereby the valve is rotatably secured to the stem.

An auxiliary valve C' is formed upon or attached to the stem C, adapted to seat against the inner seat  $a^3$  on the bushing. Below the auxiliary valve the stem is tubular to fit the polygonal spindle D. The spindle is preferably square along that portion which enters

the valve-stem; but it is round where it passes through the cap A<sup>2</sup> of the casing, so as to be rotatable therein.

The valve-stem is longitudinally movable in the tubular piston-rod E' of the piston E. Preferably the lower end of the stem is slightly enlarged and is screw-threaded externally to mesh into screw-threads formed on the inside of the tubular piston-rod, which rises centrally from the piston through the depending neck  $a^5$  on the septum  $a^4$ , which divides the casing into two chambers. The lower end of the neck  $a^5$  is formed to make a tight joint upon an annular face provided on a shoulder on the rod E' near its junction with the piston.

The upper end of the tubular piston-rod is finished off to fit snugly against the back of the auxiliary valve C', preferably entering a groove  $c$  formed therein.

The piston E is fitted to reciprocate in the cylindrical lower chamber of the casing and may have packing  $e$  in peripheral grooves. A helical spring F is confined between the piston and the septum. The piston is provided with wings  $e'$ , which interlock with wings  $a^6$  on the depending neck  $a^5$  to prevent the piston from rotating.

The spindle D has a collar  $d$  received in a recess in the cap A<sup>2</sup> and confined by a union A<sup>3</sup>, which compresses packing G against the lower face of the collar. This construction permits the spindle to be turned without any axial movement. A modified arrangement is shown in Fig. 2, where the packing is replaced by a spring H, which keeps the ground face of the collar  $d'$  closely pressed to its seat in the cap A<sup>2</sup>.

One or more lugs  $a^7$  are provided just inside the opening  $a^8$  of the casing to prevent the escape-pipe from being screwed too far into the casing. A vent  $a^9$  allows the escape of steam or air leaking into the lower chamber above the piston.

The opening  $a^{10}$  is connected with a supply of compressed air or the like, and when the valve B is to be opened fluid-pressure is admitted below the piston, lifting it to the position shown in Fig. 1 and opening the valve, the stem C sliding freely on the spindle D. If for any cause the main valve refuses to seat after the pressure has been removed from under the piston, the auxiliary valve can be



closed by turning the hand-wheel D' on the spindle. This operation will rotate the valve-stem inside of the piston-rod, causing the former to advance along the threads until the  
 5 auxiliary valve is forced against the seat  $a^3$ , closing the boiler-outlet. This operation forces the main valve still farther open, allowing anything that may be under the valve to escape. When the main valve is seated, it can  
 10 be opened by hand by turning the hand-wheel. It will thus be seen that both valves are under control of the hand-wheel and that the main valve is free to be opened and closed by the piston and the spring independently  
 15 of the hand operating devices.

Having thus described my invention, what I claim is—

1. A blow-off cock having a main valve opening inwardly against the boiler-pressure,  
 20 means for opening said valve by fluid-pressure, and a hand operating device adapted to cause a relative movement between the valve and the fluid-pressure-operating devices, whereby said valve can be opened and closed  
 25 by hand independently of and without actuating the fluid-pressure-operating devices, substantially as described.

2. A blow-off cock, having a main valve arranged to be operated by fluid-pressure, an  
 30 auxiliary valve on the same stem, and means for operating both valves by hand independently of the fluid-pressure-actuating devices, substantially as described.

3. A blow-off cock, having a main valve and  
 35 an auxiliary valve both on the same stem, a seat for each valve on a portion of the casing lying between said valves, and means for opening and closing said valves alternately, substantially as described.

40 4. A blow-off cock, having a main valve, a piston having a tubular rod, a valve-stem at-

tached to the main valve and adjustable in said tubular piston-rod, and means for adjusting said stem by hand, substantially as described.

5. A blow-off cock, having a main valve, a piston having a tubular rod, a valve-stem screwing into said rod, and means for rotating said stem by hand, substantially as described.

6. A blow-off cock, having a main valve, a piston having a tubular rod, a valve-stem screwing into said rod, and having a polygonal socket, and a polygonal spindle entering said socket, substantially as described.

7. In a blow-off cock, the combination with a piston having a tubular rod, of a valve-stem movable lengthwise therein, and cooperating faces on the end of the rod and on the stem, substantially as described.

8. In a blow-off cock, the combination with a main valve, of a piston for operating it by fluid-pressure, a rotatable spindle for operating it by hand, and means for preventing the piston from rotating, substantially as described.

9. In a blow-off cock, the combination with the piston E having wings  $e'$ , of the casing A provided with interlocking wings  $a^6$ , substantially as described.

10. In a blow-off cock, the combination with a removable bushing, having a valve-seat on each end, of a main valve and an auxiliary valve mounted on the same stem, and so arranged that when one is seated the other will  
 75 be open, substantially as described.

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

DANIEL B. DONNELLY.

Witnesses:

S. A. DIXON,

W. H. STERRITT.