No. 608,342. Patented Aug. 2, 1898.

J. F. McELROY.

VALVE.

(Application filed Jan. 21, 1893.)

(No Model.)

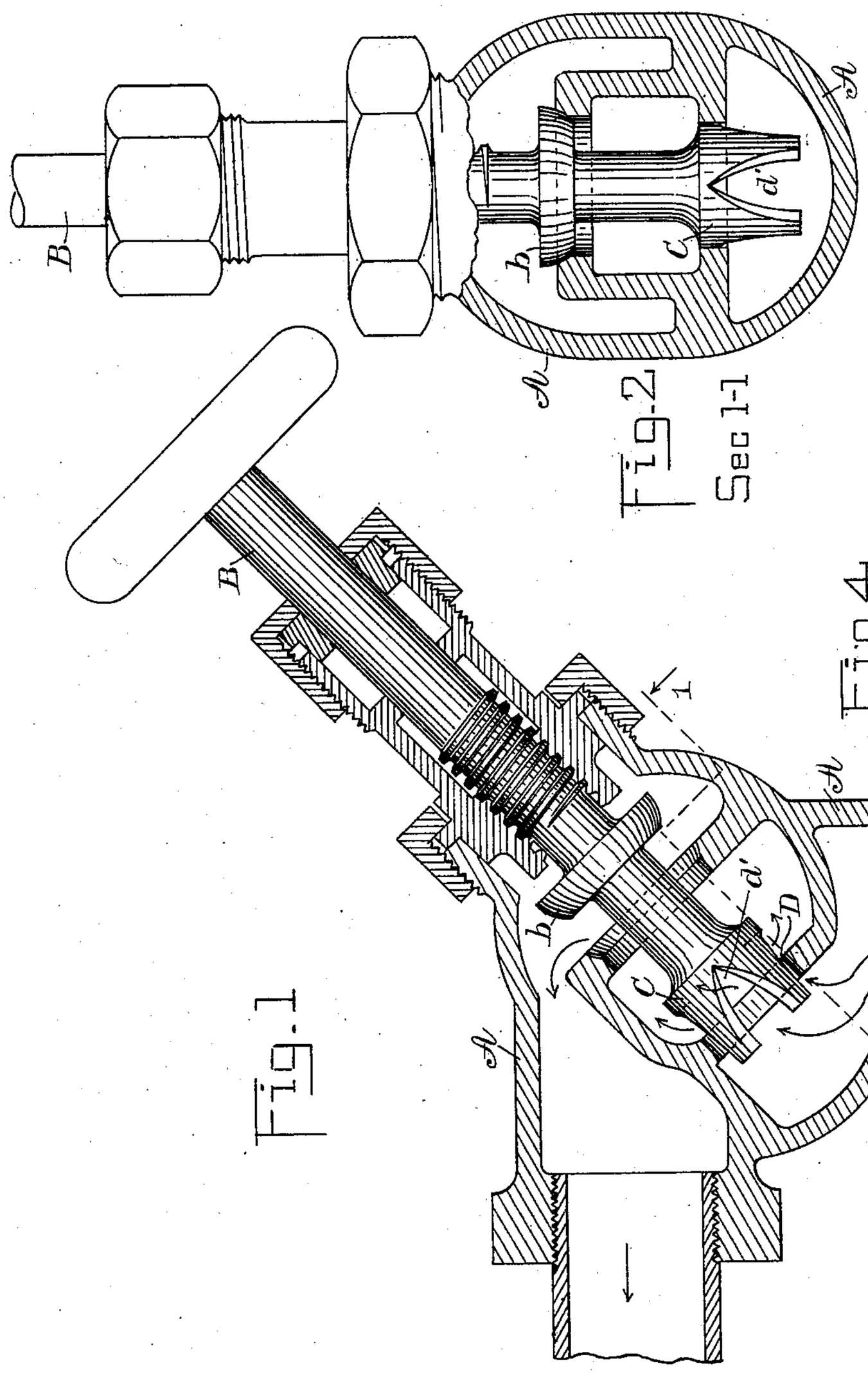

Fig. 1

Fig-3

Fig-2

Sec 1-1

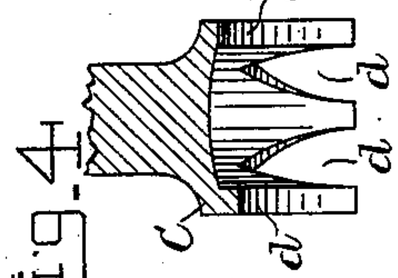

Fig-4

Witnesses:
John W. Fisher
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UNITED STATES PATENT OFFICE.

JAMES F. McELROY, OF ALBANY, NEW YORK, ASSIGNOR TO THE CONSOLIDATED CAR-HEATING COMPANY, OF SAME PLACE.

VALVE.

SPECIFICATION forming part of Letters Patent No. 608,342, dated August 2, 1898.

Application filed January 21, 1893. Serial No. 459,045. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. MCELROY, a citizen of the United States, residing in the city and county of Albany, State of New York, have invented a new and useful Improvement in Valves, of which the following is a specification.

My invention relates to improvements in valves adapted for the regulation of the admission of steam into a steam heating apparatus; and the objects of my invention are to provide a valve so arranged that the steam may be caused to enter in very minute quantities, which quantities may be gradually increased by the operation of the valve, and also to prevent the cutting of the valve-seat. I attain these objects by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a section showing the valve partly open. Fig. 2 is a section along the lines 1 1 on Fig. 1, showing the valve closed. Fig. 3 is a plan of the hollow cylinder C, taken from its lower end; and Fig. 4 is a section of the hollow cylinder C.

Similar letters refer to similar parts throughout the several views.

The valve A is provided with a valve-stem B, suitably mounted and which may be arranged in an oblique position, as shown in Fig. 1; but I do not limit myself to this position.

On the valve-stem B, I arrange a valve-disk *b*, and at the end of the valve-stem, below the valve-disk *b*, I construct a hollow cylinder C. The valve-casing is bored out at D to receive the hollow cylinder C as a piston. The hollow cylinder C is provided with cuneiform openings *d* on each side thereof, making four in all, three of said openings extending from the bottom of the cylinder to very near the top. One of the openings *d'* I usually make longer than the others—that is, extending to nearer the top of the cylinder—as shown in section in Fig. 4 and also in Fig. 1.

When the valve-stem B is tightly closed, the disk *b* fits closely in its seat, the hollow cylinder C finds a seat within the opening D, and the steam is completely shut off. By opening the valve the steam entering through the pipe F will fill the hollow cylinder C and find vent through the apex of the port *d'*, allowing the steam to enter the valve A in very minute quantities. By continuing to lift the cylinder C the opening is increased and a larger port is found at *d'* and a very small opening at *d d d*. Thus the entrance of the steam may be very easily controlled and such quantities only admitted as is advisable.

When the valve-disk is near to its seat, but very little steam can flow through the small portion of the opening in the valve-casing, and hence no cutting would take place at the seat itself.

When it is desired to get the full flow of the valve, it is evident that it would be simply necessary to open it to its full extent.

It is noticed that I have two valves in series operated by means of a common stem, which gives a graduated opening through triangular or equivalent ports in a cylindrical valve.

The longer opening *d'*, extending from the bottom of the cylinder, is so arranged that when the disk *b* is closed there will still be a slight opening through which steam may pass from below the cylinder, but be prevented from passing the disk *b*. The advantage of this is that by a very slight movement of the valve-stem a very small discharge of steam may be emitted through the valve, thus making a very quickly-operated valve.

My valve is especially applicable in car-heating apparatus, where it is desirable first to obtain the full flow of steam in heating up the car and afterward to throttle it, so that little steam is admitted.

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

1. In a valve, the combination of a casing, a valve-stem and means for operating the same, two valves arranged to be operated thereby in series, one designed to shut off absolutely, the other designed to give a constant but graduated flow, substantially as described and for the purpose set forth.

2. In a compound valve, the combination of a casing, a valve-stem working therein, a valve-disk operated thereby designed to open

and close absolutely, a cylindrical valve adapted to be simultaneously operated by the same stem and capable of movement in a corresponding aperture in said casing and being provided with ports through its sides so arranged that fluid is throttled gradually, but not entirely shut off, and passage-ways leading to and from said casing, so arranged that the valves operate in series, substantially as described and for the purpose set forth.

JAMES F. McELROY.

Witnesses:
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WILLIAM P. EDDY.