No. 621,928. Patented Mar. 28, 1899.

H. N. LIBBEY.

GATE VALVE.

(Application filed Mar. 21, 1898. Renewed Mar. 2, 1899.)

(No Model.)

Fig. 1.

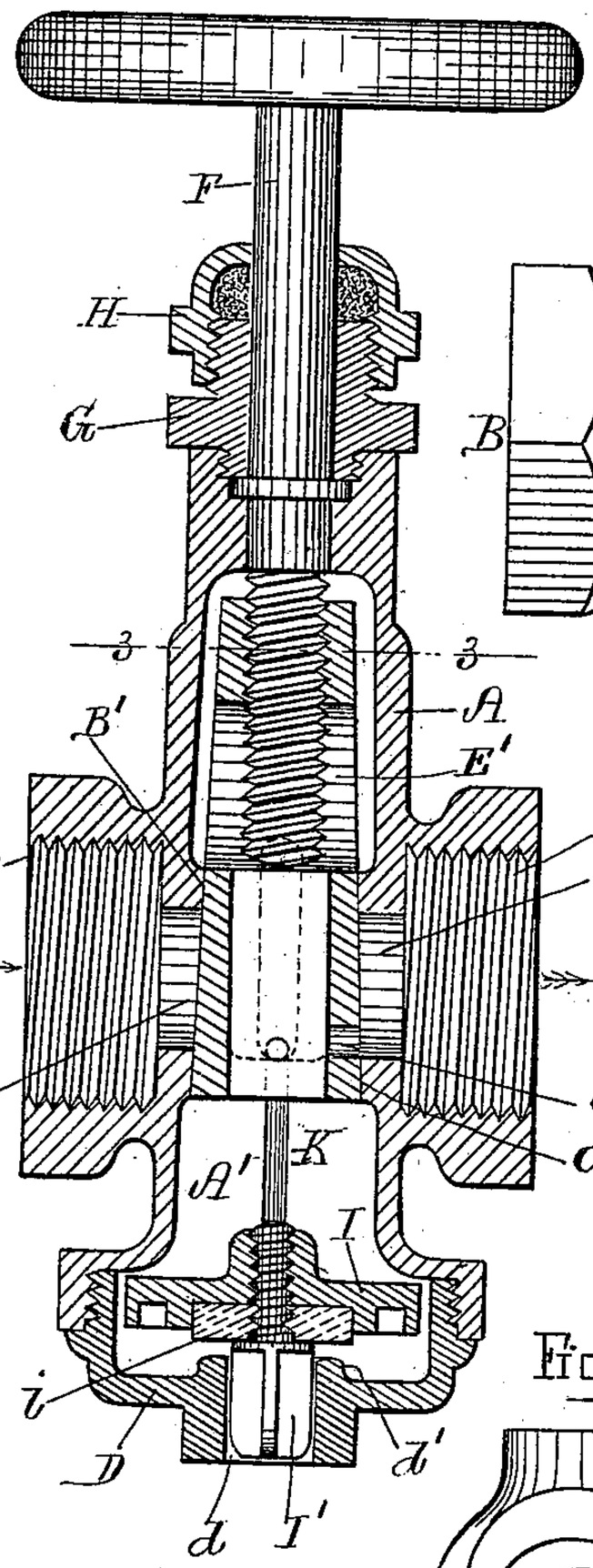


Fig. 2.

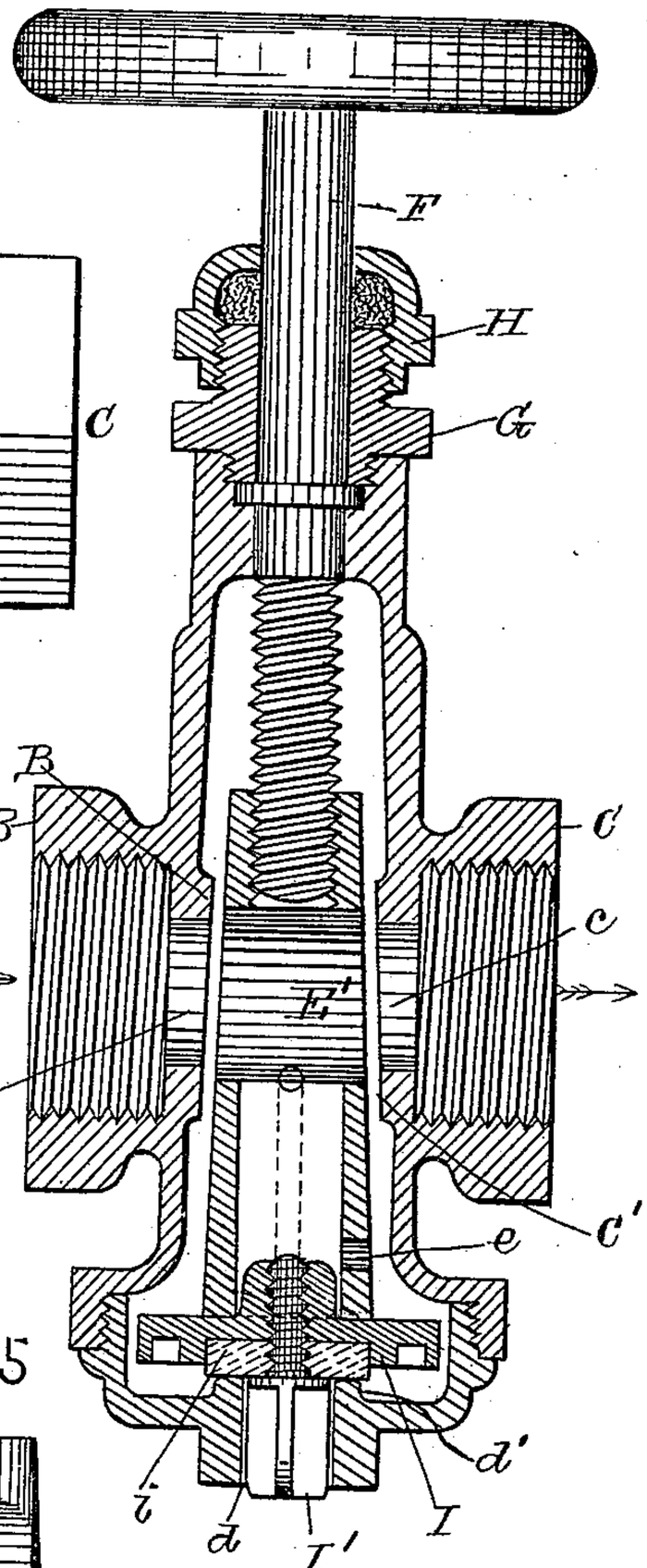


Fig. 3.

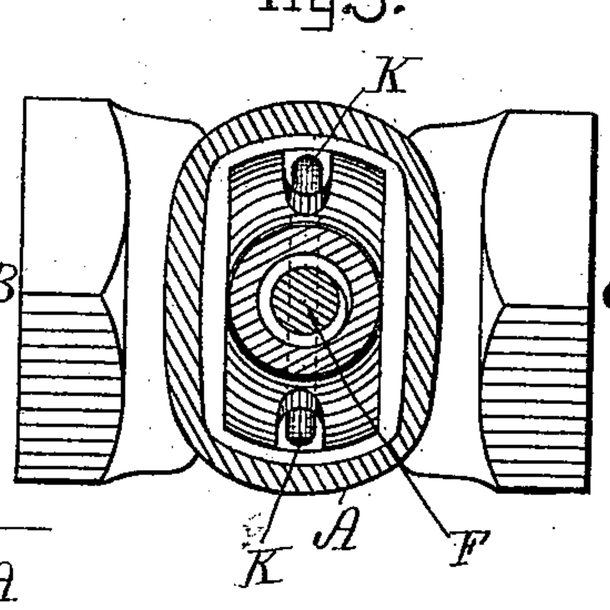


Fig. 4.

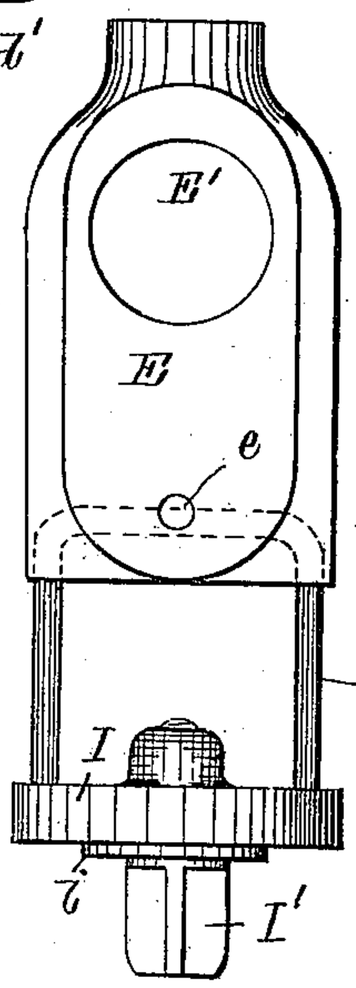
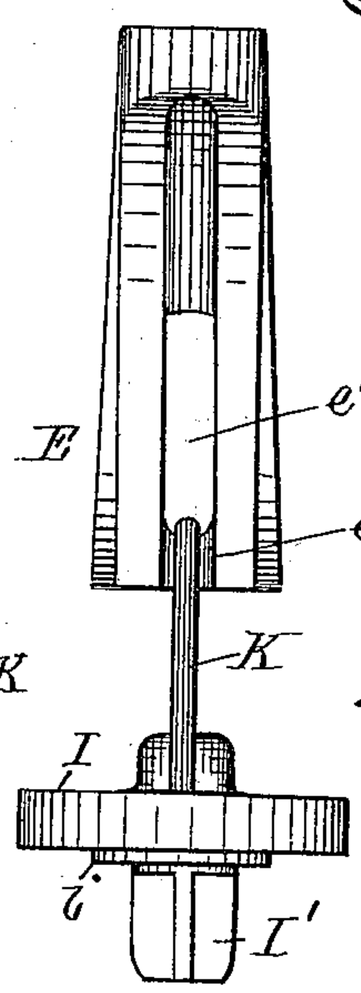


Fig. 5.



Witnesses.

Laurits N. Möller

Charles E. Mawdsley

Inventor.

Henry N. Libbey

by Albert Andrews

his atty.

UNITED STATES PATENT OFFICE.

HENRY N. LIBBEY, OF BOSTON, MASSACHUSETTS.

GATE-VALVE.

SPECIFICATION forming part of Letters Patent No. 621,928, dated March 28, 1899.

Application filed March 21, 1898. Renewed March 2, 1899. Serial No. 707,542. (No model.)

To all whom it may concern:

Be it known that I, HENRY N. LIBBEY, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Gate-Valves, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in gate-valves for steam or liquids under pressure, and it is carried out as follows, reference being had to the accompanying drawings, wherein—

Figure 1 represents a vertical section showing the gate closed and the drip-valve open. Fig. 2 represents a similar vertical section showing the gate open and the drip-valve closed. Fig. 3 represents a cross-section on the line 3 3, shown in Fig. 1. Fig. 4 represents a detail side view of the gate and drip-valve, and Fig. 5 represents an end view of Fig. 4.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

In the drawings, A represents the valve-shell, with its supply and delivery branches B and C, as is common in devices of this kind.

B′ and C′ are perforated valve-seats at the inner ends of the respective branches B and C.

A′ is a chamber in the lower portion of the shell A, and to the lower end of such chamber is detachably secured the screw-threaded perforated cap or cover D, as shown.

Within the valve-shell A is located the longitudinally-adjustable tapering gate or plug E, having a transverse perforation E′ coinciding, or nearly so, with the perforations *b c* in the valve-seats B′ C′ when the valve is open, as shown in Fig. 2. The plug or valve E is guided in a suitable manner within the shell A and is actuated by a screw-threaded valve-spindle F, journaled in the upper end of said shell and provided at its upper end with a suitable hand-wheel *f*, as is common in devices of this kind.

G represents the gland, and H the stuffing-box, for the valve-spindle, as usual.

The plug E is hollow, as shown, and in the lower portion of that side next the delivery branch C is formed a small perforation *e*, which when the gate is closed places the branch C and the pipes connected thereto in communication with the interior of the plug or gate and permits the water to drain from out said branch and pipes through the plug into the chamber A′ and from out the latter through the opening *d* for the purpose of preventing the liquid in the pipes from freezing in cold weather, as most clearly shown in Fig. 1.

The removable cap D has a central discharge-opening *d*, the upper end of which terminates as a valve-seat *d′* for the drip-valve.

I represents the drip-valve, provided on its under side preferably with a washer *i*, of leather or other suitable material, which when the said drip-valve is closed is caused to rest by gravity and pressure on the seat *d′*, as shown in Fig. 2.

I′ is a preferably cruciform guide-stem secured to the valve I and fitting loosely within the discharge-perforation *d*, and it serves as a guide for the drip-valve I during its vertical adjustment.

To the valve I is secured an upwardly-projecting bail K, the upper end of which is movable in a slot *e′* in the valve or plug E, as shown in detail in Figs. 4 and 5. The said slot *e′* terminates in its lower end as a transverse bar or projection *e″*, which serves as a means for raising the drip-valve clear off its seat *d′* when the plug or valve E is closed, as shown in Fig. 1.

The operation is as follows: The valve is opened by moving the plug E downward, as shown in Fig. 2, when communication is established between the branches B and C, and during such position of the said plug the vent *e* is closed by the valve I dropping by gravity and pressure against the seat *d′*, thus positively closing the drip-discharge opening *d* by gravity and by the pressure of the steam and liquid within the valve-shell. When the plug E is raised upward and closed against the valve-seats B′ C′ as it reaches its closed position, it causes the drip-valve I to be raised above the seat *d′*, by which an open communication is established from the branch C to the discharge-opening *d* through the perforation *e*, plug E, and lower chamber A′, thus draining the branch C and pipes connected thereto of the liquid contained therein, as and for the purpose hereinabove described.

Having thus fully described the nature, con-

struction, and operation of my invention, I wish to secure by Letters Patent and claim—

1. In a gate-valve, the combination of the shell having supply and delivery branches and valve-seats thereon, a hollow adjustable plug open at its lower end and provided with a port arranged to place the delivery branch in communication with the interior of the plug when the latter is closed against its valve-seats, a discharge-opening in the bottom of the valve-shell provided with a valve-seat, and a drip-valve loosely suspended from the valve-plug and arranged to be raised above its seat on said discharge-opening when the valve-plug is raised and automatically closed by gravity and the pressure of the fluid when the valve-plug is open, substantially as described.

2. In a gate-valve, the combination of the shell having supply and delivery branches and valve-seats thereon, an adjustable, vertically-slotted plug provided with a port arranged to place the delivery branch in communication with a discharge-opening in the bottom of the valve-shell, a valve-seat formed on said discharge-opening, a drip-valve arranged to seat on said valve-seat, and a bail loosely suspended in the vertical slot in the valve-plug and attached at its lower end to the drip-valve, the arrangement being such that the drip-valve is raised from its seat when the valve-plug is raised and automatically closed by gravity and the pressure of the fluid when the valve-plug is open, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 18th day of March, A. D. 1897.

HENRY N. LIBBEY.

Witnesses:
ALBAN ANDRÉN,
GEORGE C. WHORF.