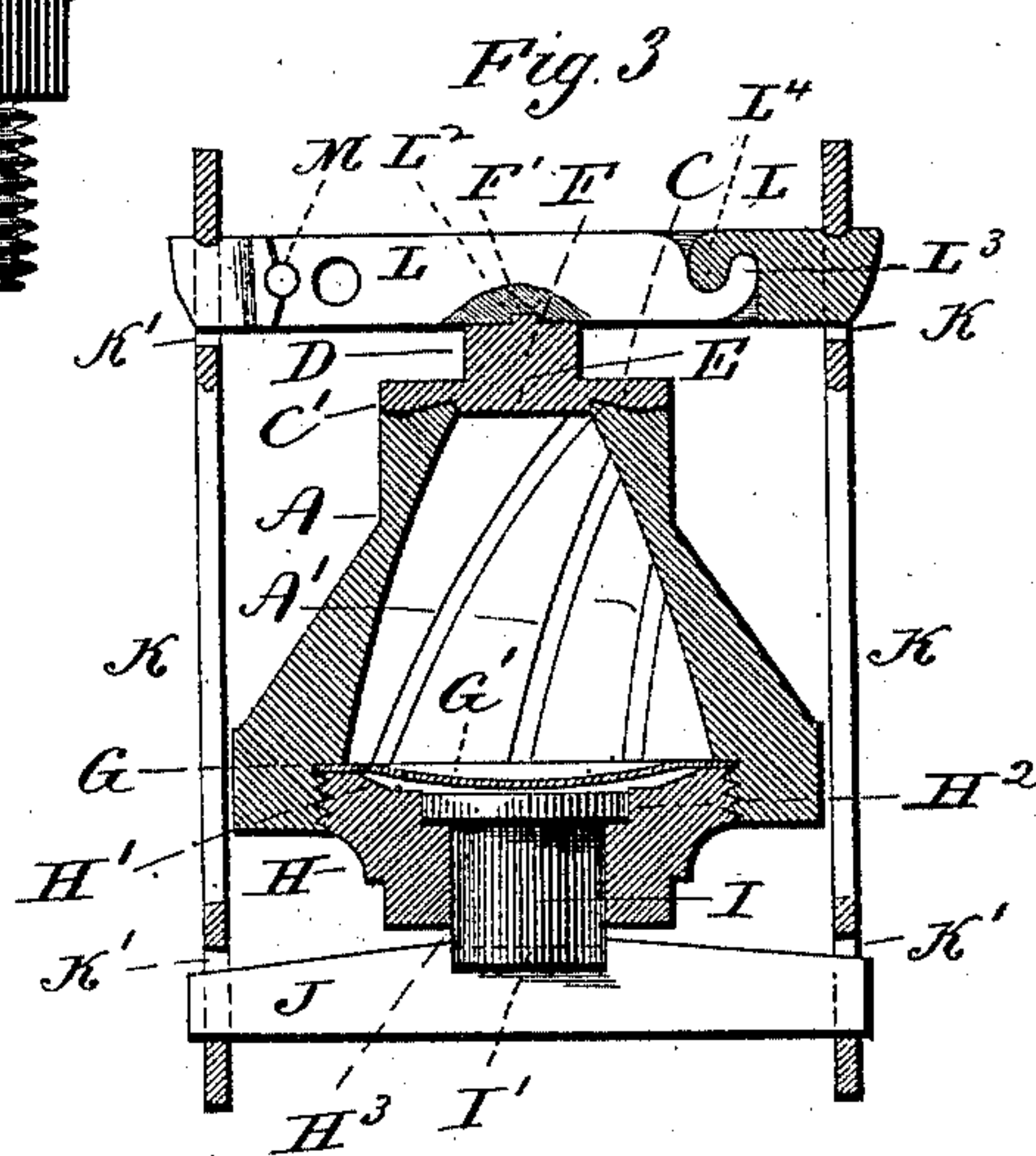
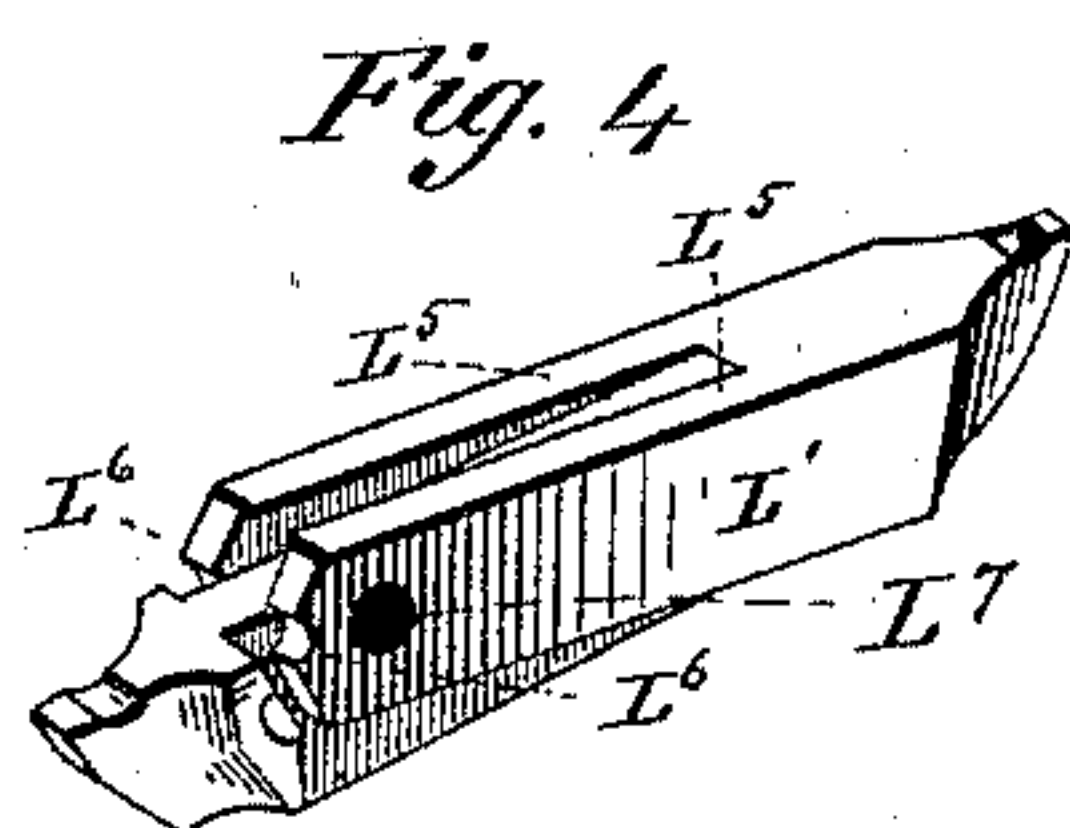
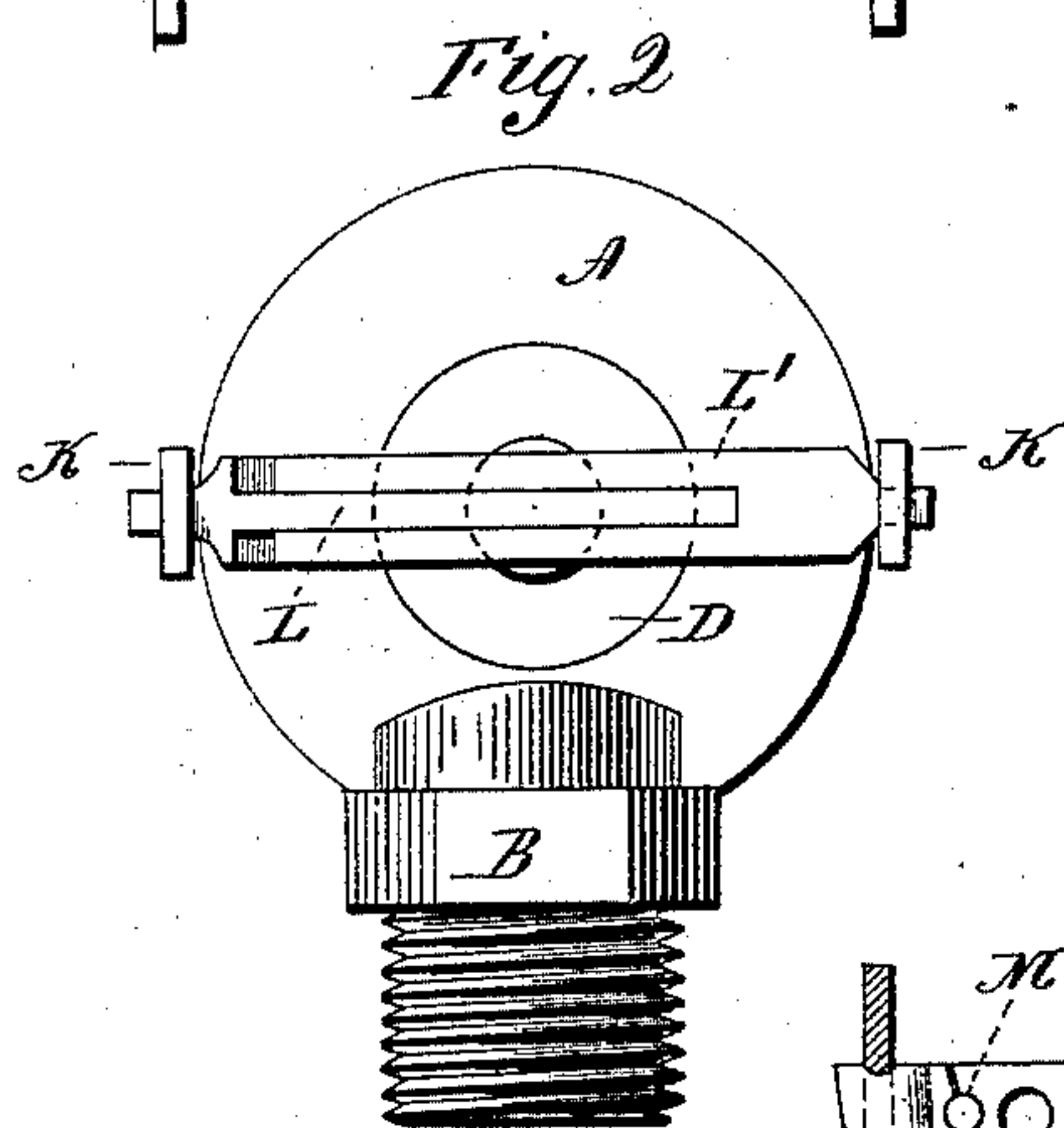
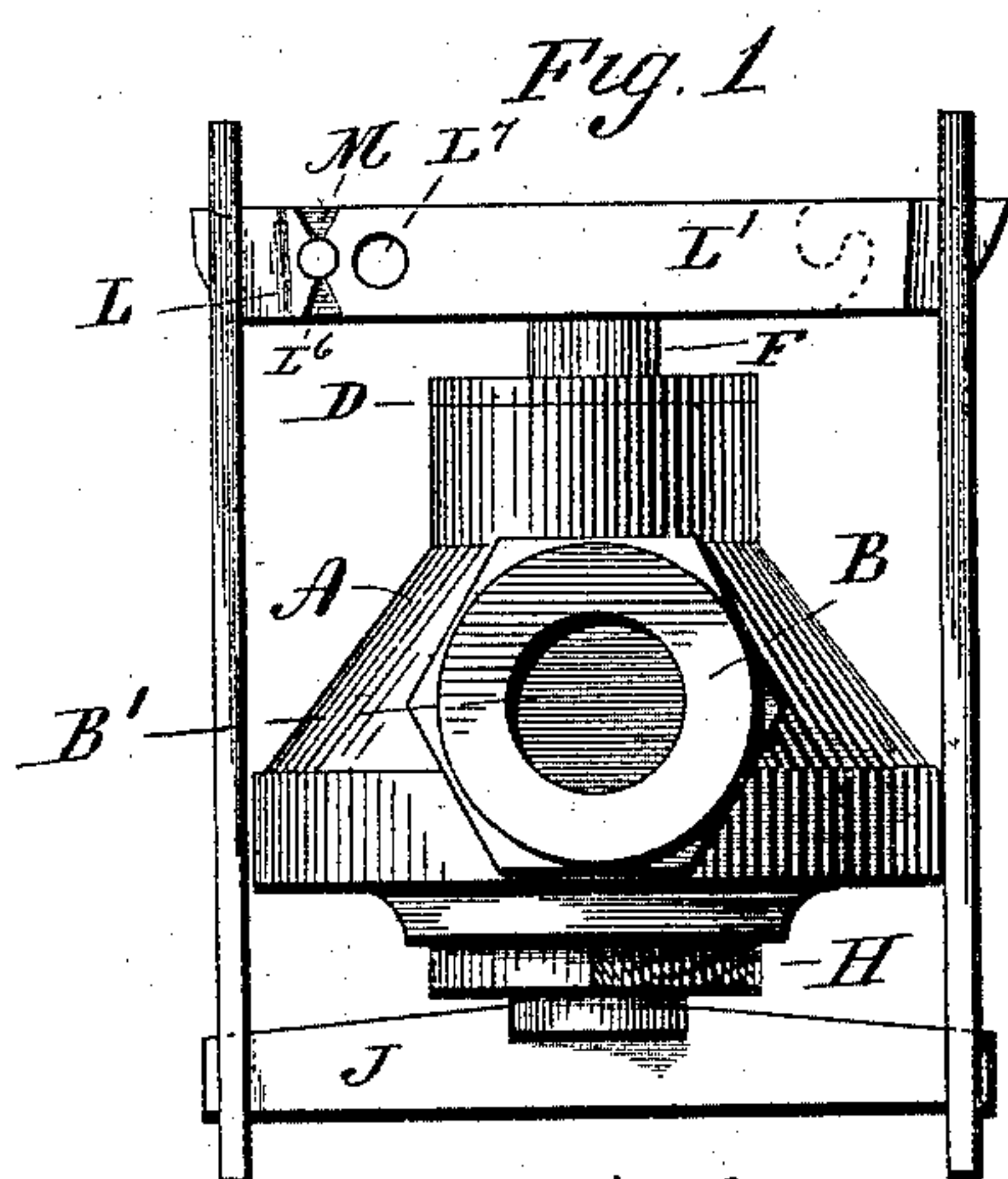


(No Model.)

J. BISHOP.
AUTOMATIC FIRE EXTINGUISHER.

No. 441,923.

Patented Dec. 2, 1890.



Witnesses
J. P. Shumway.
Lillian D. Kellogg

Joseph Bishop
Inventor
Bottle's
Pack of paper

UNITED STATES PATENT OFFICE.

JOSEPH BISHOP, OF MERIDEN, CONNECTICUT, ASSIGNOR OF ONE-HALF TO
WILLIAM B. CASHEN, OF SAME PLACE.

AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 441,923, dated December 2, 1890.

Application filed September 15, 1890. Serial No. 364,981. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH BISHOP, of Meriden, in the county of New Haven and State of Connecticut, have invented a new Improvement in Automatic Fire-Extinguishers; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in side elevation of one form which a sprinkler-head constructed in accordance with my invention may assume. Fig. 2 is a plan view thereof. Fig. 3 is a view of the device in vertical central section, and Fig. 4 is a detached perspective view showing the compound cross-bar falling apart or uncoupling.

My invention relates to sprinkler-heads for stationary fire-extinguishers, the object being to produce a simple, reliable, and effective head adapted to accommodate itself to variations in water-pressure and to expansion and contraction in itself, due to change of temperature, and so avoid leaking without attention and adjustment.

With these ends in view my invention consists in a sprinkler-head having certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

As herein shown, the body of the head consists of a conical or bell-shaped cast-metal shell A, open at both ends and having its smaller end uppermost, and provided with a threaded intake or pipe-connection B, which is made integral with it. The interior walls of the shell are provided with spiral flutings or grooves A', terminating at its upper end and imparting a rotary movement to the water, so that after being discharged from the shell it spreads and falls in a large circular cascade. The upper end of the shell is worked down and provided with a shallow annular groove C to form a seat for the valve D, which is provided upon its lower face with a corresponding rib C' and with a central boss E, which enters the shell and prevents the lateral displacement of the valve, which is pro-

vided upon its upper face with a similar boss F, which is furnished with a short retaining-pin F', the function of which will appear later on. An annular shoulder G, formed within the shell below the inlet-port B', forms a seat for a diaphragm G', made of sheet metal and having its edges pressed against the said shoulder by means of a nut H, which is screwed into the lower end of the shell and countersunk upon its inner face, as at H', to give clearance to the diaphragm and permit the same to be centrally depressed by the pressure of water in the upper part of the shell, which is fluted or grooved down to the level of the diaphragm. The said face of the nut is also centrally chambered, as at H², to receive the flanged upper end of a free plunger I, the main body or stem whereof projects downward through the central opening H³ of the nut. The lower end of the said stem is provided with a transverse slot I', which receives the cross-bar J of a frame also composed of two upright side bars K K, having a slot K' formed in each of their ends and united at their lower ends by the said bar, which enters the slots in their lower ends, and at their upper ends by a compound cross-bar composed of levers L and L', respectively entering the slots in the upper ends of the side bars and normally coupled together by means of a pin M, of fusible solder, which shears away when softened by heat and permits the levers to fall apart and release the valve, which they normally hold down upon its seat, the lever L being thereto provided with a small hole L² to receive the retaining-pin F', before mentioned. The said lever L is provided at its inner end with a hook L³, which engages with a shoulder L⁴, located between the two members L⁵ L⁵, formed by longitudinally slotting the lever L', the main part or tongue of the lever L entering the said slot and the said hook and shoulder taking part of the strain imposed upon the compound lever from the fusible pin, which passes through the said tongue at the base thereof and bears at its ends upon bearings L⁶ L⁶, which are beveled to give clearance to the members L⁵ L⁵ aforesaid and to expose the pin to the heat, for which purposes

the ends of the said members are also beveled. The said tongue and members are also furnished with perforations L^7 , which align when the levers are assembled and further expose the pin to the action of the air about it. If desired, the lower cross-bar J and the links K K of the frame may be made integral with each other, in which case it would as readily fall away from the head after the uncoupling and dismemberment of the upper bar.

It will be understood that under the construction shown and described the pressure of the water in the shell upon the diaphragm will force the center of the same down upon the flanged upper end of the plunger, which will press down upon the lower cross-bar and cause the side bars to pull the compound upper cross-bar down upon the valve and hold the same upon its seat. The valve is thus secured in place by the pressure of the water in the head. Provision will be made to allow the diaphragm and plunger to have sufficient play to take up contraction and expansion in the several parts of the head and to compensate for variations in the water-pressure, whereby the head does not need constant attention to keep it from leaking, as do some heads of prior construction. When the temperature of the apartment containing the head gets high enough to soften the fusible pin, the strain on the levers of the compound upper cross-bar causes them to shear it away and drop apart, after which the water will force the valve from its seat, when the water will be cascaded from the upper end of the head, rising therefrom in a circling column and then spreading out and falling over a large circular area without the aid of a deflector.

If desired, a small spreader, preferably cone-shaped, and having its surface spirally convoluted, and located in the upper end of the shell, may take the place of the flutings or grooves herein shown. If desired, also, the fusible solder may be applied as a film or layer, or in some, so to speak, concreted or molded form other than a pin, which is only one form of fusible tie that might be used. I would therefore have it understood that I do not limit myself to the exact construction shown and described, but hold myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

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

1. In a sprinkler-head, the combination, with a head adapted to impart a swirling and spreading movement to the water as the same is discharged from its upper end, of a valve seated upon its upper end, a diaphragm located below its inlet-port, a plunger located below the

diaphragm, so as to be operated thereby, a frame arranged to hold the valve normally in place and engaged by the plunger, which puts it under pressure, and a fusible tie for holding the frame together, substantially as described.

2. In a sprinkler-head, the combination, with a shell into which the water is admitted, of a valve seated upon its upper end, which is the smaller, a diaphragm located within the shell below its inlet-port, a plunger located below the diaphragm to be operated thereby, and a frame holding the valve in place and pushed down by the plunger, which engages with it, and including a fusible tie, substantially as described.

3. In a sprinkler-head, the combination, with a shell having its interior walls spirally fluted or grooved, of a valve seated upon its upper end, which is the smaller, a diaphragm located below its inlet-port and sealed at its edges, a chambered and centrally-perforated nut located in the lower end of the shell, a plunger located in the chamber of the nut so as to be acted upon by the diaphragm and projecting below the nut through the opening therein, and a frame embracing the valve and plunger and held down by the latter and including two parts normally coupled together by a fusible tie, substantially as described.

4. In a sprinkler-head, the combination, with a shell having its interior walls spirally fluted or grooved, of a valve seated upon its upper end, which is the smaller, a diaphragm located below its inlet-port and sealed at its edges, a chambered and centrally-perforated nut located in the lower end of the shell, a plunger supported by the said nut in position to be acted upon by the diaphragm, and a frame consisting of a lower cross-bar engaged by the plunger, two side bars, and an upper cross-bar composed of two parts coupled together by a fusible tie and one of them being engaged with the valve, substantially as described.

5. In a sprinkler-head, the combination, with a shell, a valve, a diaphragm, and a plunger, of a frame operated upon by the plunger for holding the valve in place and including two levers normally coupled together at one end by a fusible pin and at the other end by a hook and shoulder, one lever having a tongue which enters into a slot formed in the other lever, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOSEPH BISHOP.

Witnesses:

J. H. SHUMWAY,
WM. B. CASHEN.