

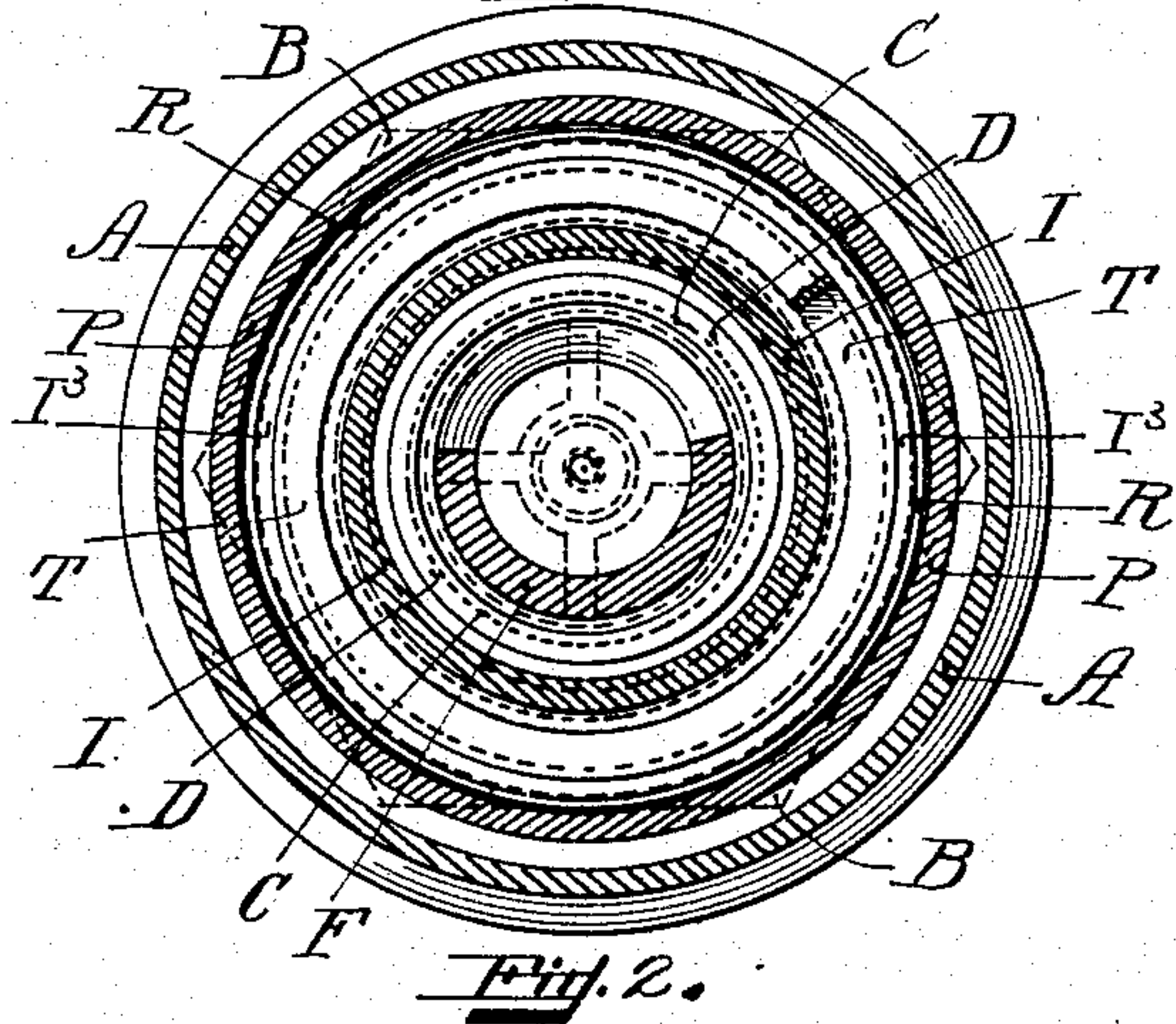
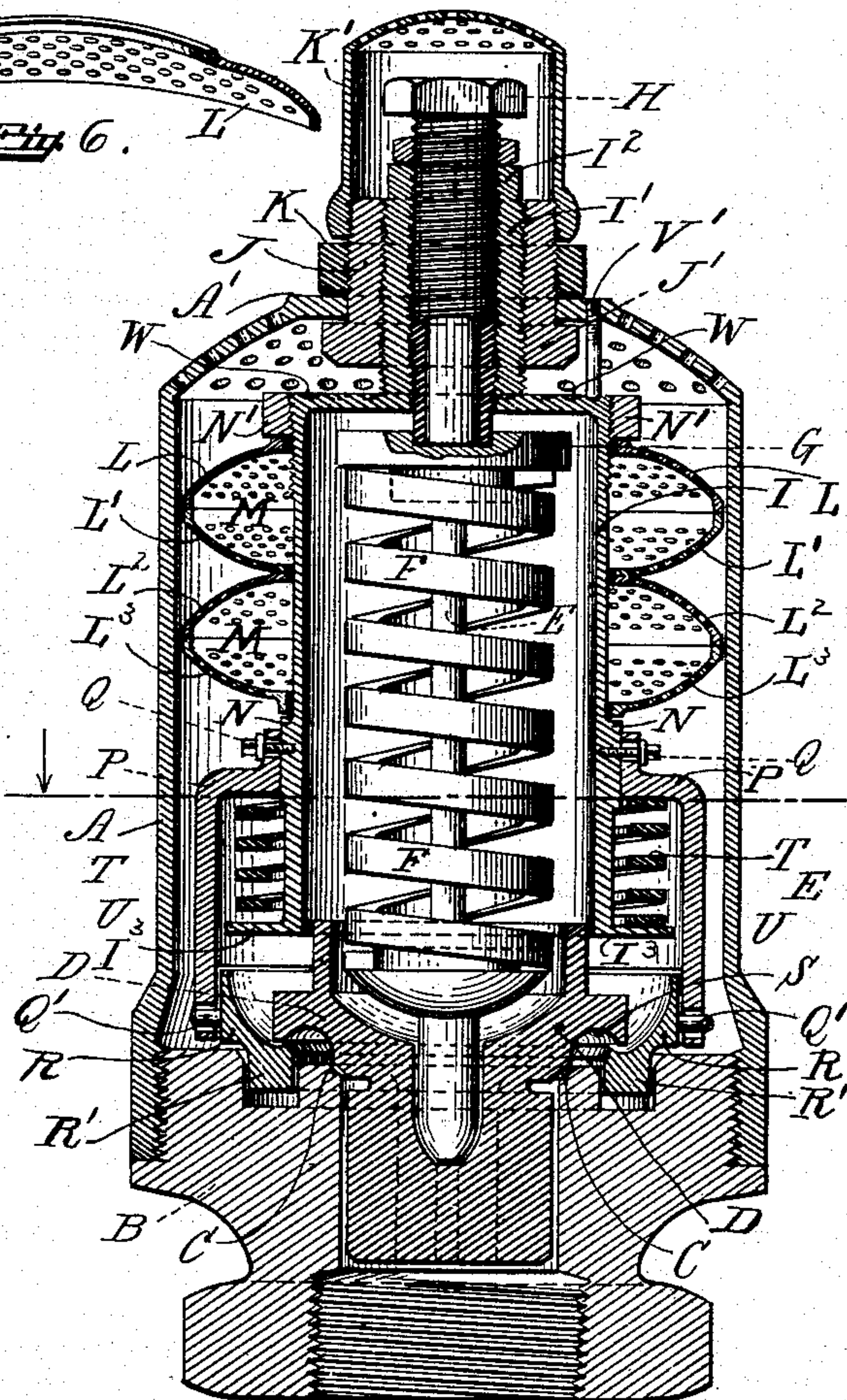
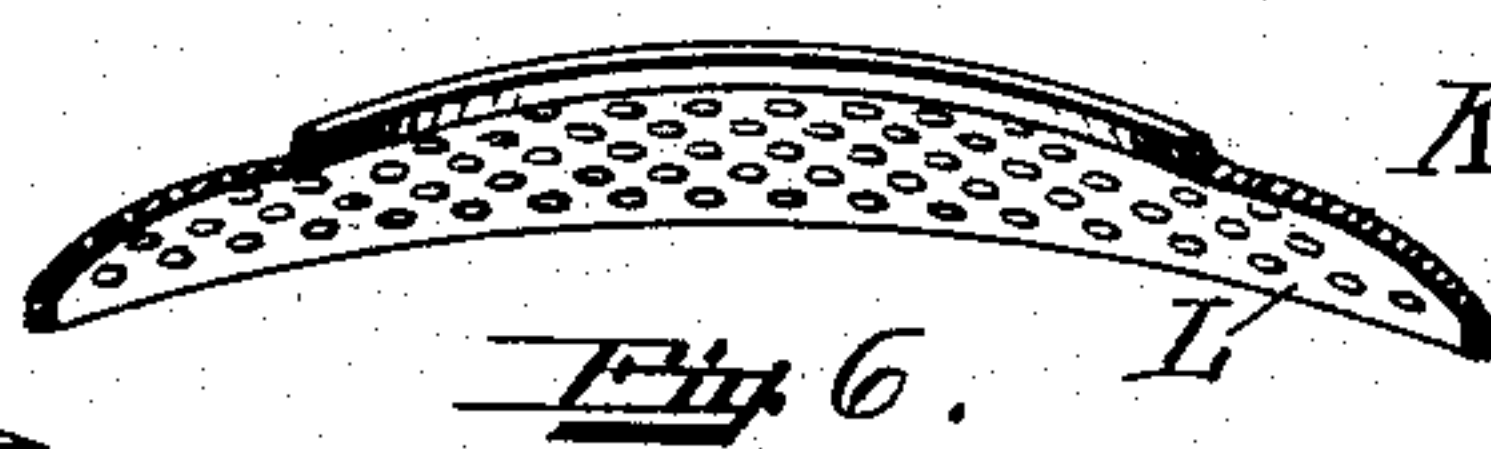
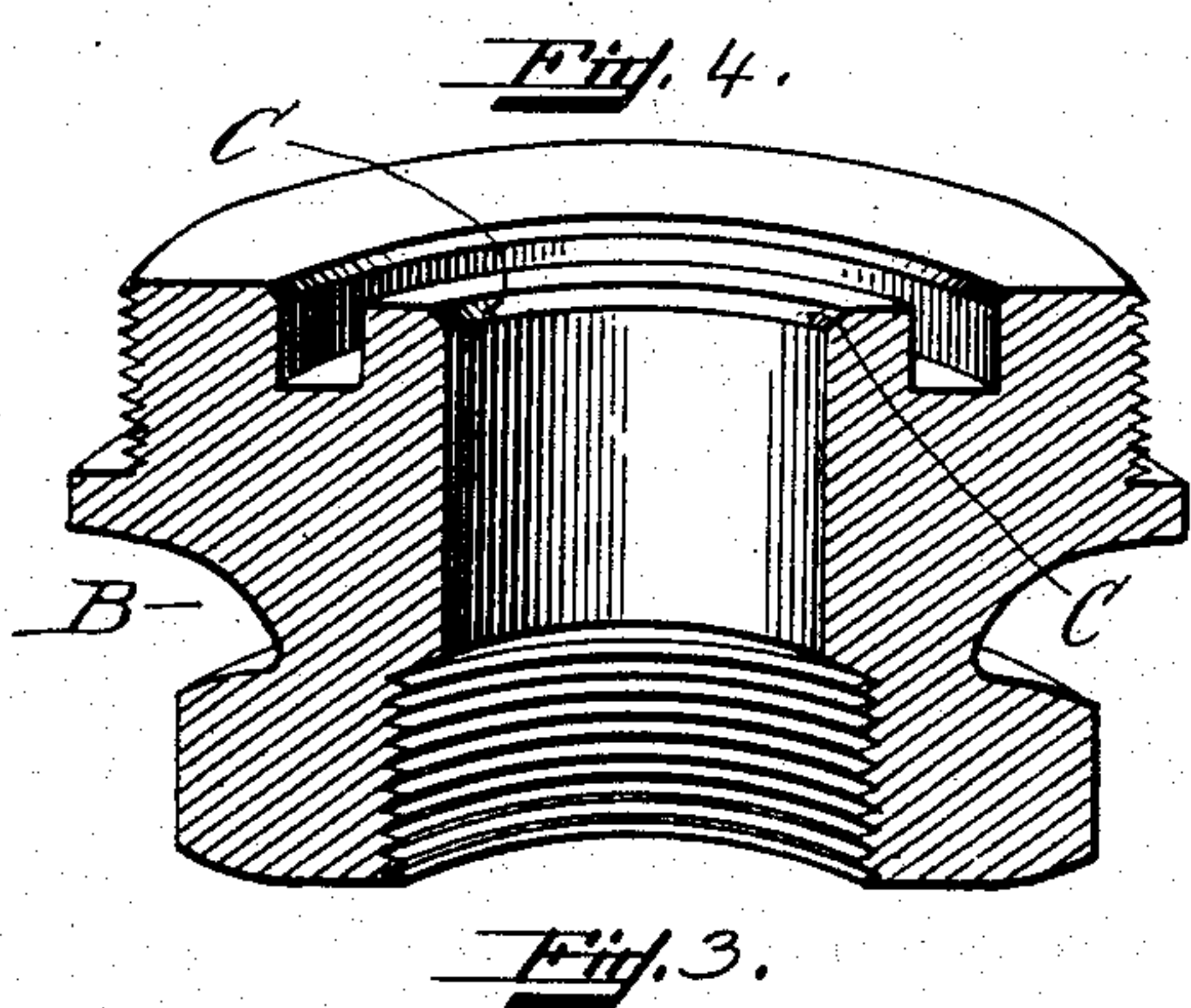
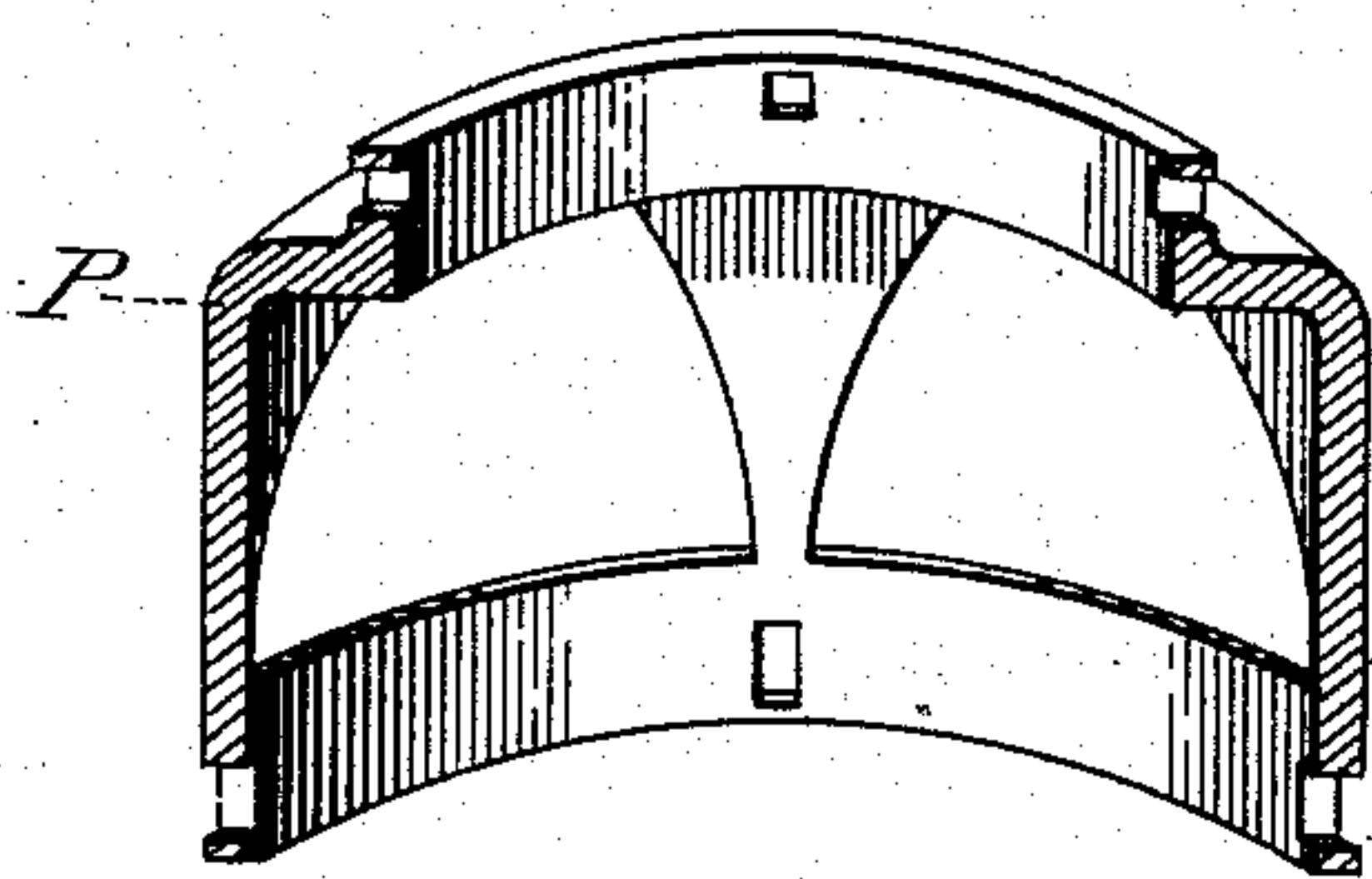
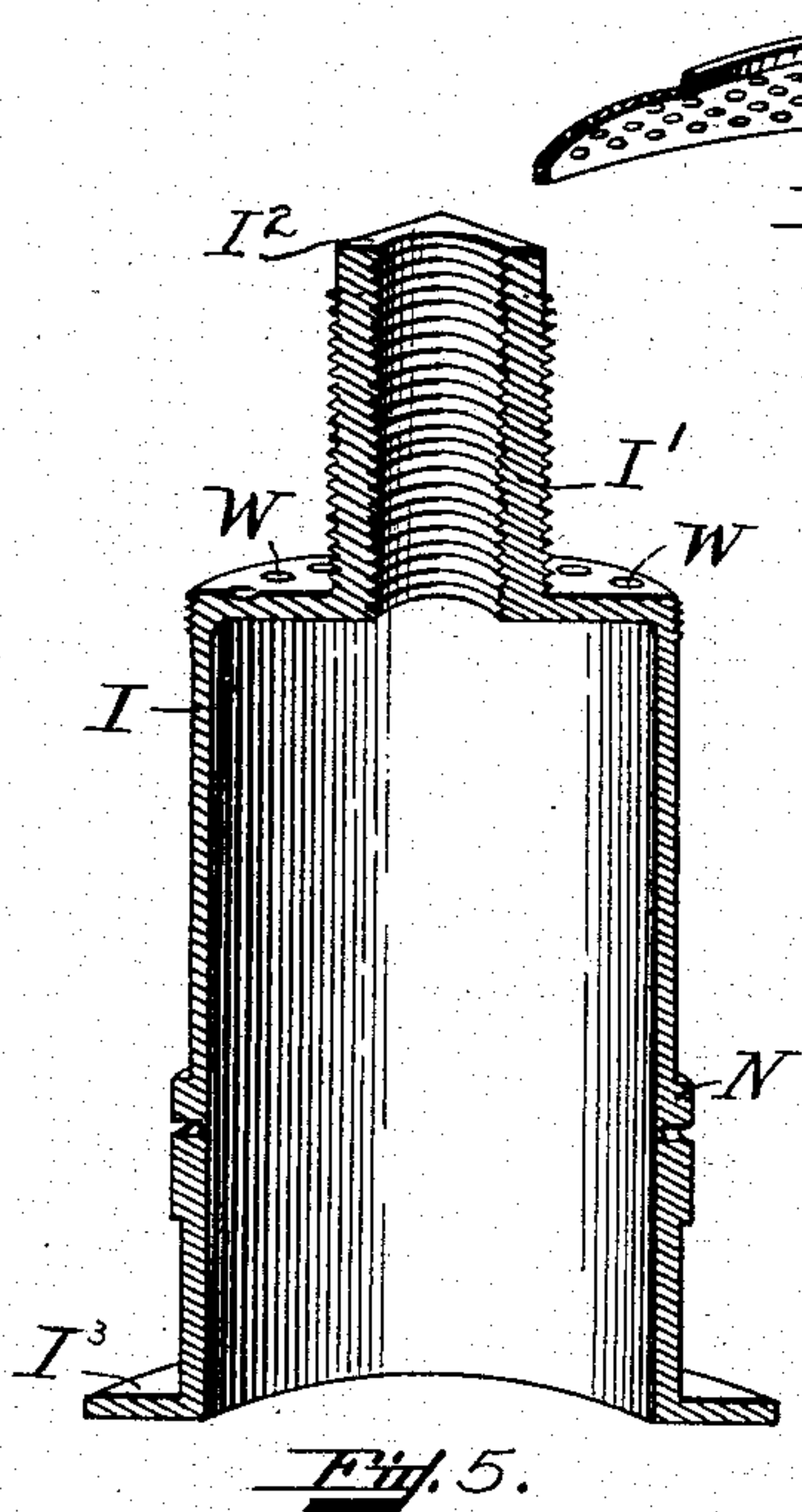
No. 675,513.

Patented June 4, 1901.

C. H. KAPLINGER.
SAFETY VALVE.

(Application filed Oct. 11, 1900.)

(No Model.)



Witness: H. W. Mearnshead
H. Remick-son

Inventor: C. H. Kaplinger
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UNITED STATES PATENT OFFICE.

CHRISTIAN H. KAPLINGER, OF JAMAICA PLAIN, MASSACHUSETTS.

SAFETY-VALVE.

SPECIFICATION forming part of Letters Patent No. 675,513, dated June 4, 1901.

Application filed October 11, 1900. Serial No. 32,735. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN H. KAPLINGER, a citizen of the United States, residing at Jamaica Plain, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Safety-Valves for Locomotive or other Steam-Boilers, of which the following is a specification.

My invention relates principally to those parts in such valves which regulate the action of the valve so as to avoid undue waste of steam in relieving the boiler. This object I attain by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a central vertical section of a valve embodying my invention. Fig. 2 is a plan or top view of a section of the same below the line indicated by the arrow. Fig. 3 is a perspective in section of the base of the valve and valve-seat. Fig. 4 is a perspective in section of one-half the circular bracket which surrounds the spring-case and supports the relief-ring. Fig. 5 is a vertical section of the detached spring-case. Fig. 6 is a perspective in section of half of one of the concaved and perforated muffler-plates.

The general construction of the valve comprises the usual outer casing A, which is screwed onto a base B, on which is formed the valve-seat C.

D is the valve; E, the spindle; F, the spring; G, the follower, and H the compression-screw for adjusting the spring F and which bears against the top of the follower G. An outer casing I encloses spring F and has a threaded neck I', which extends upward through an opening in the top of the outer casing, as shown, and terminates in an octagonal top or head I², by which it is turned. This neck I' is threaded into a clamping-piece J, having an inverted head J', and the body J is passed upward from the interior of casing A through top A' thereof. Upon the body J is threaded a ring K, which is turned down thereon against the upper side of the casing-top A', and thus the top is firmly clamped between the parts K and J'. Above ring K is a cap K', which extends over all, and is threaded on the top of part J. The compressing-screw H is threaded into the neck I' and is turned up and down therein to adjust the tension of the spring F, while the casing I has an up-and-down adjustment

by its threaded connection with part J and for a purpose which will be explained. The casing I extends downward within casing A and around spring F and the upper part of valve D and terminates in an annular flange I³, as shown in Fig. 5.

Upon case I are placed a series of concaved and perforated muffler-plates L, L', L², and L³, so as to form two chambers M M, as shown, the lower plate L³ resting against shoulder N, while a ring N' is threaded onto the top of the casing I against the upper muffler-plate L. The chambers thus formed may be filled with any suitable muffling material if deemed advisable or necessary. Below the mufflers there is attached to the casing by bolts, as shown and so as to have a slight vertical play, an encircling bracket P, which has a collar fitted to the thickened portion of the casing and secured by bolts Q, passed through slots in said collar and threaded into the casing. Below the collar the bracket is enlarged in diameter and large openings are made through the body, but leaving material enough to support properly the annular bottom thereof, which also has a series of slots through the same, as shown clearly in Fig. 4, through which slots screws Q' are passed and threaded into the relief-ring R, which surrounds the main valve D, a portion of the ring R' being suspended in an annular groove in the base B. The bracket P rests upon a spring T, which surrounds the casing within the bracket and bears upon the flange I³ of the casing. The bracket and relief-ring R are suspended by this spring; the ring in part surrounding the valve D just below the annular groove S in the valve outside of the valve-seat. The ring R under the construction and arrangement described acts automatically as an auxiliary to the main valve in regulating the escape of the steam when the main valve is lifted by the pressure of steam against the force of the compressing-spring F.

The tension of spring F may be regulated above the valve-casing by removing cap K' and turning screw H against the follower G until the required compression of the spring is attained. Then "blow-back" space may be adjusted by turning the top I² of the spring-casing I, which will raise or lower the relief-

ring R accordingly and adjust it relatively to valve-groove S, as required. When this adjustment is made by so turning the casing to which bracket P is attached, the casing may be secured in place by the locking-screw V, which is threaded into the top of the outer casing and the lower end of which enters one of the series of holes W in top of the inner-casing and holds the latter against turning out of adjustment. When the main valve D and the auxiliary relief-ring R are thus adjusted, the ring R, acted on by the blow-back against the resistance of spring T, will automatically open and expand the space through which the steam escapes and contract the same again when the boiler-pressure is removed and in a more prompt and sensitive manner than the more rigidly held main valve acts. This independent action of the auxiliary valve or relief-ring R, which thus automatically regulates the space through which the blow-back steam escapes whatever the adjustment of the main-valve spring may be, constitutes the chief novelty of my present invention and serves to lessen the waste of steam-pressure and loss of power when the main valve is opened by prompt reaction when a proper amount of boiler relief has been attained.

30 I claim—

1. The combination, in a safety-valve, of a base provided with a valve-seat, a valve provided with an annular groove in its under side and outside of the valve-seat, means for pressing said valve to its seat against the pressure of steam beneath it, a ring surrounding said valve and upheld by an elastic support which is vertically adjustable; and an outer casing inclosing said parts, all substantially as specified.

2. The combination, in a safety-valve, of a base provided with a valve-seat, a valve provided with an annular groove in its under side, outside of said valve-seat, suitable means for pressing said valve to its seat against the

pressure of steam beneath it, a ring surrounding said valve, an inner casing surrounding the pressure devices and adjustable vertically from above the main casing, and upholding said ring by a yielding support; and an outer casing inclosing said parts, all substantially as specified.

3. In a safety-valve, the combination with the inclosed valve-seat, valve, and pressure-spring, of an auxiliary ring arranged around and below the annular groove in the under side of the valve, and supported upon a spring so that it may be slightly depressed by the action of the escaping steam, whereby the steam-passage is enlarged by such pressure automatically, and reduced again when the boiler is relieved, thus promptly avoiding undue waste of steam, as specified.

4. The combination in a safety-valve, of the casing A, provided with an opening A', through its top, and threaded upon base B, having a valve-seat C therein; valve D seated upon said seat and having an annular groove S in the under side thereof; a depressing-spring F arranged to bear upon said valve; an inclosing case I provided with an adjustable screw-neck I', which passes through and above the top of the outer casing; a threaded thimble J, which passes through the top A' of casing A to its clamping-head J', a collar K threaded onto thimble J so as to clamp top A' between parts K and J'; bracket P attached to casing I by bolts Q, and having a slight freedom of vertical movements thereon while resting upon a spring T, supported upon a flange I³; and a ring R suspended from bracket P, by bolts Q', and adjustable vertically with said casing I, and capable of depression upon the supporting-spring by the action of the escaping steam, all as and for the purposes specified.

CHRISTIAN H. KAPLINGER.

Witnesses:

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