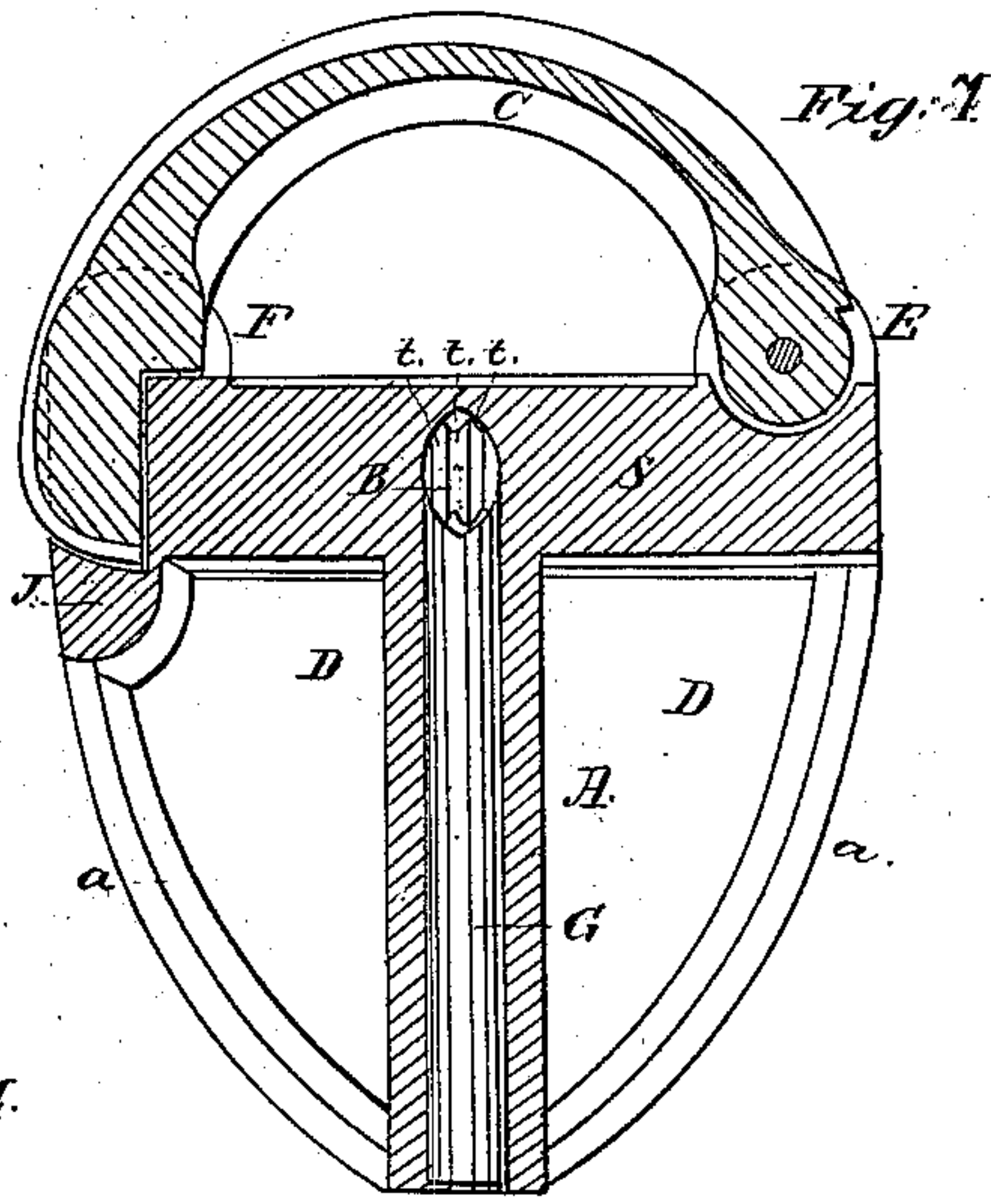
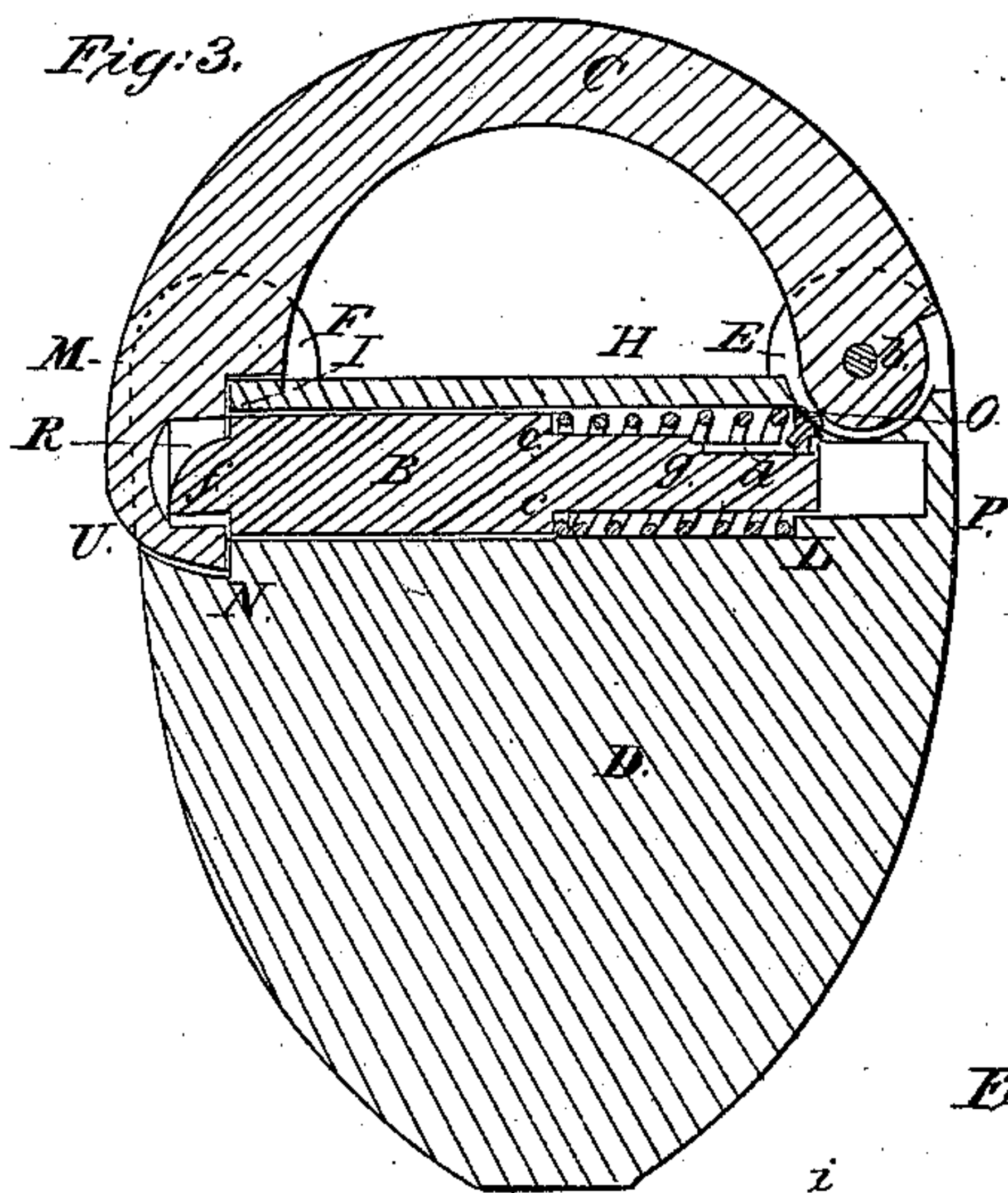
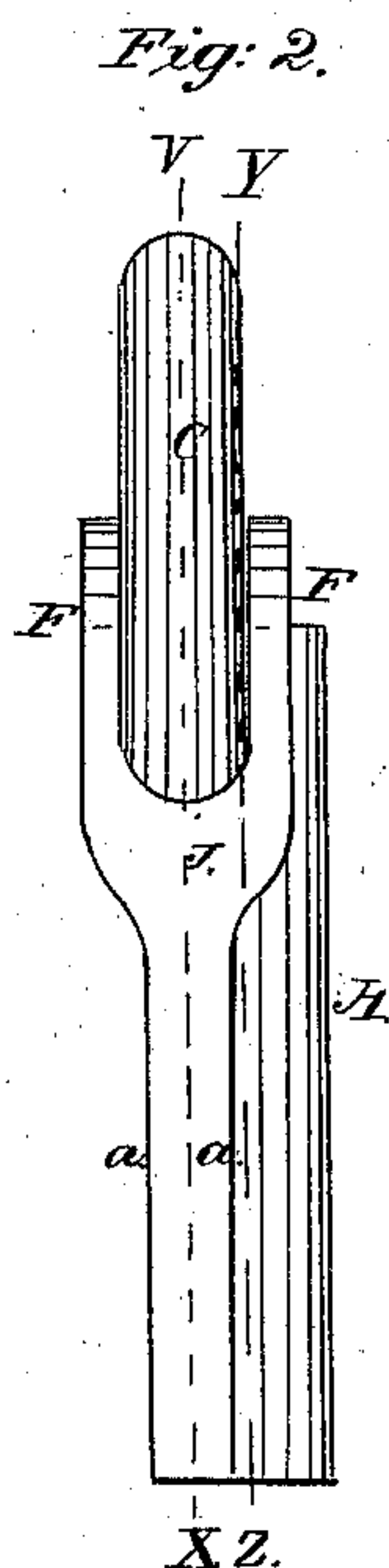
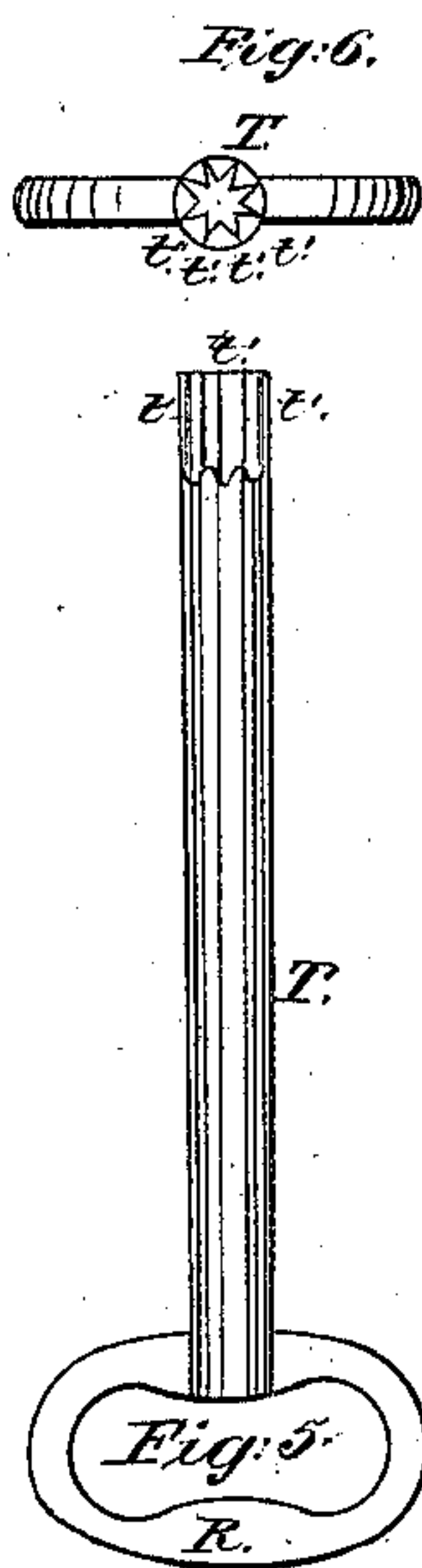
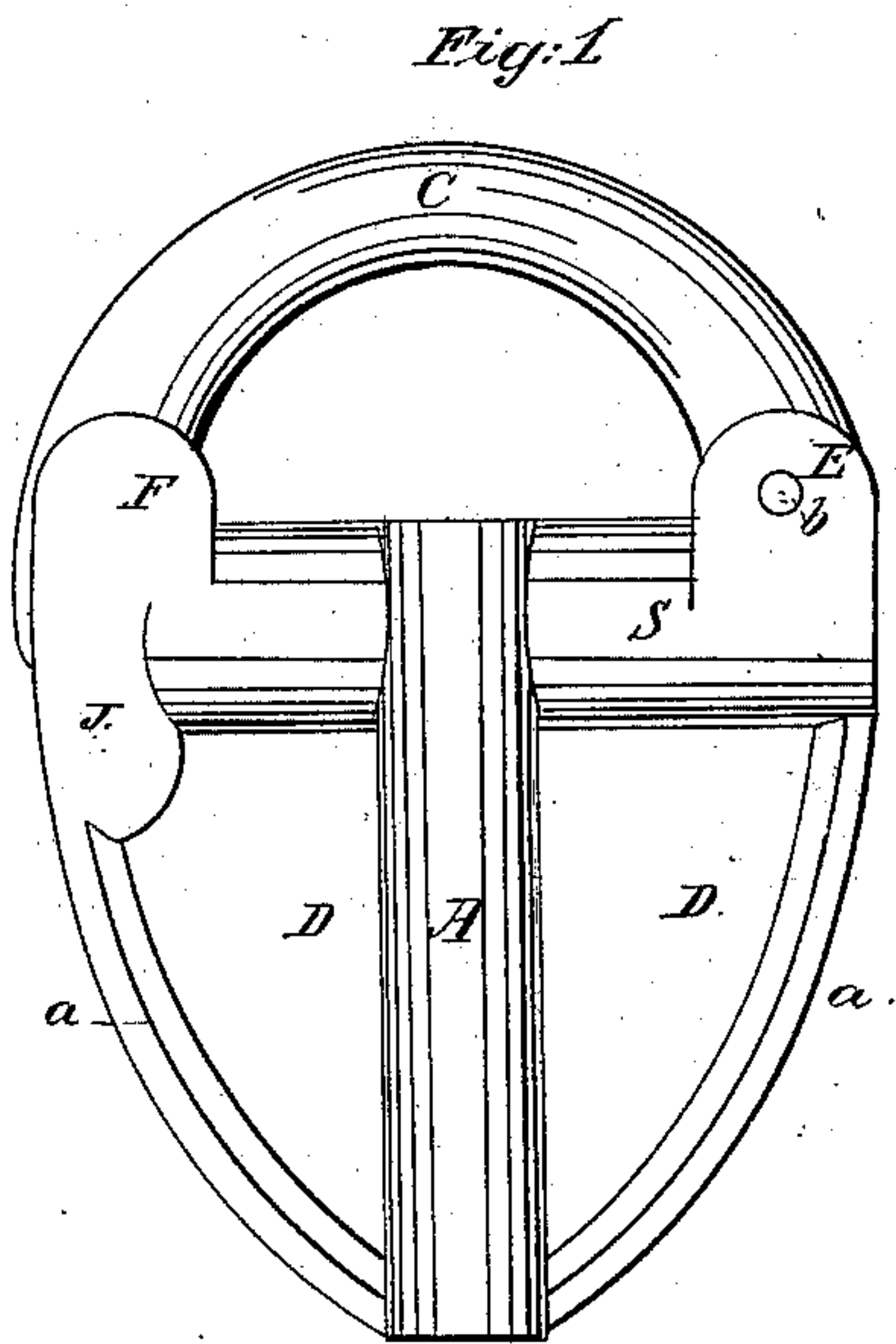


*D. F. Randall,*

*Padlock,*

*No. 79,859*

*Patented July 14, 1868.*



Witnesses.  
*Ogden Kuswold.*  
*M. L. Perry.*

Inventor  
*D. F. Randall*  
By *Buckland Huntis*  
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# United States Patent Office.

DAVID F. RANDALL, OF CHICOPEE, MASSACHUSETTS.

*Letters Patent No. 79,859, dated July 14, 1868.*

## IMPROVEMENT IN PADLOCKS.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, DAVID F. RANDALL, of Chicopee, in the county of Hampden, and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Padlocks; and I do hereby declare that the following is a full and exact description thereof, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon, of which—

Figure 1 is a front elevation of said padlock.

Figure 2 is a side elevation.

Figure 3 is a longitudinal vertical section through the line V X, fig. 2.

Figure 4 is a similar section through the line Y Z, fig. 2.

Figures 5 and 6 are respectively a front elevation and plan of the key; and

Figure 7 is a plan of the bolt.

The nature of my invention consists in constructing a padlock, of the kind known as spring-locks, in such a manner as to combine strength, simplicity, and the property of excluding water from the interior. Its strength consists in the fact that the parts are few in number, and that the body of the padlock is cast entire, in a single piece, thus avoiding the use of the side-pieces and rims generally used in forming the case of common padlocks. The number of parts which I use to construct my improved padlock are six, viz, the body in one piece, the bolt, the spiral spring, and the shackle, together with a pin on which the shackle turns, and a small screw.

The arrangements for excluding water, and thereby rust and ice from the interior of the lock, consist in leaving but two openings into the interior, one being at the key-hole, which opens downward, and therefore is not exposed, and the other at the joint where the bolt projects from its socket. The joint at this latter point is made as close as possible, and the locking-end of the shackle is made to fit closely into its seat in the body of the lock, so that water is, for the most part, prevented from entering the lock, by the few openings, and the manner of guarding those openings.

The construction of my invention is as follows: The body of the lock consists of a key-tube, A, and bolt-socket, S, which intersect in the form of a T, and rest upon a web or plate, D, and the ears E E F F. A small rim, *a a*, encircles the curved edge of the body, and adds strength thereto. The projection of the key-tube A is entirely on the front side of the web D, while the bolt-socket rests upon the upper edge of the web, and projects equally on either side thereof. The ears E E are formed upon the upper side of S, at one end, for receiving the heel of the shackle C, and with holes therein for the pin or rivet *b*, and the ears F F at the other end of S, for receiving the locking-end of the shackle. Within the part A, which I denominate a key-tube, is formed the cylindrical opening G, extending from the bottom of the tube nearly to the upper end of A, and opening into the side of the bolt-socket S. This bolt-socket S contains a cylindrical opening, I L, arranged at a right angle to the key-passage G. A continuation of this opening from L to P is of less diameter, and forms a bearing for the rear end of the bolt B. Between the ears E E is a curved depression, which receives the end of the heel of the shackle. Between the ears F F the locking-end of the shackle descends into the seat M N U, the sides of which seat are smoothly finished. The body of the lock is also made thicker at J, to afford space for a secure seat for the locking-end of the shackle. I prefer to form the body of the lock of brass or other metal not easily corroded, to avoid the oxidation which occurs in the iron bodies of exposed padlocks.

The bolt B is constructed of a cylindrical piece of iron or steel. A portion of one end, to the shoulder *i i*, is of smaller diameter, and a portion at the opposite end, from the shoulder *c c*, is also turned down to a less diameter, to afford room for the spiral spring H coiled around it. The end is chamfered off, or bevelled, as shown at *f*, so that the end of the shackle meeting it will slide upon the inclined surface *f*, and press the bolt back into the socket.

The rear end of the bolt slides in that portion of the socket between L and P. A portion of the bolt, near the middle of one side, is serrated by filing or cutting, so as to leave the ridges *t t t*, which serve as the



teeth of a rack, fitting the teeth of a pinion cut upon the key, and hereafter described. A narrow slot, *d*, is cut in the bolt B, into which projects the end of the small screw or detent O. This detent enters an opening in the curved depression which receives the heel of the shackle, and has a male-screw thread cut upon a portion of its length, turning in a corresponding female-screw thread cut in the face of the opening. A transverse slot in the head of the detent O serves for turning the detent into its seat, so that the top shall be flush with the surface of the curved depression. This detent, screwing tightly into its place, closes the opening at that point into the body of the lock, so that no water can enter the lock at that side.

The length of the slot *d* is such that the detent O, projecting into it, will prevent the bolt from being thrown too far out by the action of the spring H. The latter is a spiral spring, made of wire, of such size as to enter the space between the smaller part of the bolt and the inside of the bolt-socket. One end of this spring engages with the bolt at the shoulders *c c*, and the other end presses against the shoulders in the socket at L L. The action of the spring will therefore tend to project the bolt forward from the socket as far as the slot *d* and detent O will allow. The portion *f* of the bolt should protrude from the socket, and no more.

The shackle C is of the usual semicircular form, and rounded, except the heel and locking-end. The end of the heel is shaped to fit the curved depression between the ears E E, and the sides are squared to move evenly between such ears. The shackle turns upon a pin or rivet, *h*, passing through an opening in the heel, and openings in the ears E E. The locking-end of the shackle is formed to fit closely into its seat M N U, and the sides are smoothly finished to move snugly between the ears F F. I propose to form the joint which the locking-end of the shackle makes with the body when in its seat, as close as can be made without causing the moving parts to bind, in order to prevent water from entering at this point. A recess for the end, *f*, of the bolt is formed in the shackle at R. It will be seen that the arrangement of the parts about the locking-end of the shackle and its seat, is such that when the bolt is within the recess R, the shackle cannot be detached from the body of the padlock by removing the rivet *b*, as the locking-end will still be held fast between the point U of the body and the lower part of F.

The body of the lock may be cast solid, and the key-tube and bolt-socket afterwards drilled, or the latter may be formed when the body is cast, by means of cores or chills, and afterwards fitted up. The web D may be perforated to give lightness to the structure of the body, the essential parts of which are the key-tube and bolt-socket. Arranged in a T-shape, however, they may be strengthened by a web or rim. The bolt, with its encircling spring, is inserted in the bolt-socket, the detent O is screwed into place, the heel of the shackle C is placed between the ears E E, and secured by the pin or rivet *b*, and the padlock is then in operative condition. When the locking-end of the shackle is pressed down into its seat, the bolt B will be forced back into the socket, until the opening R is opposite the end of the bolt, when the portion *f* will, by the action of the spring H, be projected into the recess R, and the shackle will be thereby locked in place.

Having described the construction of the padlock, it only remains to describe the key used with it, and shown in figs. 5 and 6. The key consists of an eye, R, and elongated shank, T, a portion of which has uniform longitudinal grooves cut upon it, leaving the parallel ridges *t' t'*, which form the teeth of a pinion, and engage with the teeth formed upon the bolt B.

To unlock the shackle, therefore, the key is inserted until the teeth *t' t'* engage with the teeth *t t* on the side of the bolt, and is then turned until the end of the bolt *f* is disengaged from the recess R in the shackle, when the locking-end of the shackle can be lifted from its seat, and the padlock is unlocked.

This lock is designed especially for use in exposed positions, and under violent usage, as in the case of padlocks for freight-cars, and like applications, where great numbers of strong and duplicate padlocks are in constant use. The forming of the body in one piece, strengthened by webs and rims, and the small number of parts employed to make an operative padlock, are believed to afford great advantages in point of strength and simplicity. It is also well known that in the case of freight-car padlocks of the ordinary construction, many are annually filled with solid ice from water penetrating the interior, and are then necessarily broken apart and destroyed to obtain access to the cars locked by them. The means I have employed and described for excluding water, and the small water-space left in the interior wherein ice can form, are intended to obviate the trouble, delay, and expense incident to the use of ordinary padlocks.

The elongated key-shank and key-tube are arranged for the purpose of removing the bolt as far as possible from the key-hole, that the same cannot be readily tampered with, or reached by false implements of any kind.

I am aware that a rack and pinion have been used for operating the bolt in locks, and do not claim such device as used apart from my described arrangement of other parts.

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

1. The arrangement of the detent O in the curved depression beneath the heel of the shackle, so that the detent cannot be removed without detaching the shackle from the body of the padlock, as set forth.
2. The combination of the padlock-body formed as described, slotted and serrated bolt B, spring H, detent O, and shackle C, with the elongated and ridged key-shank T, the whole constructed and operating substantially as described.

D. F. RANDALL.

Witnesses:

C. N. GILBERT,  
J. P. BUCKLAND.