

H. L. Arnold.

Letter Lock.

N^o 89,826.

Patented May 4, 1869.

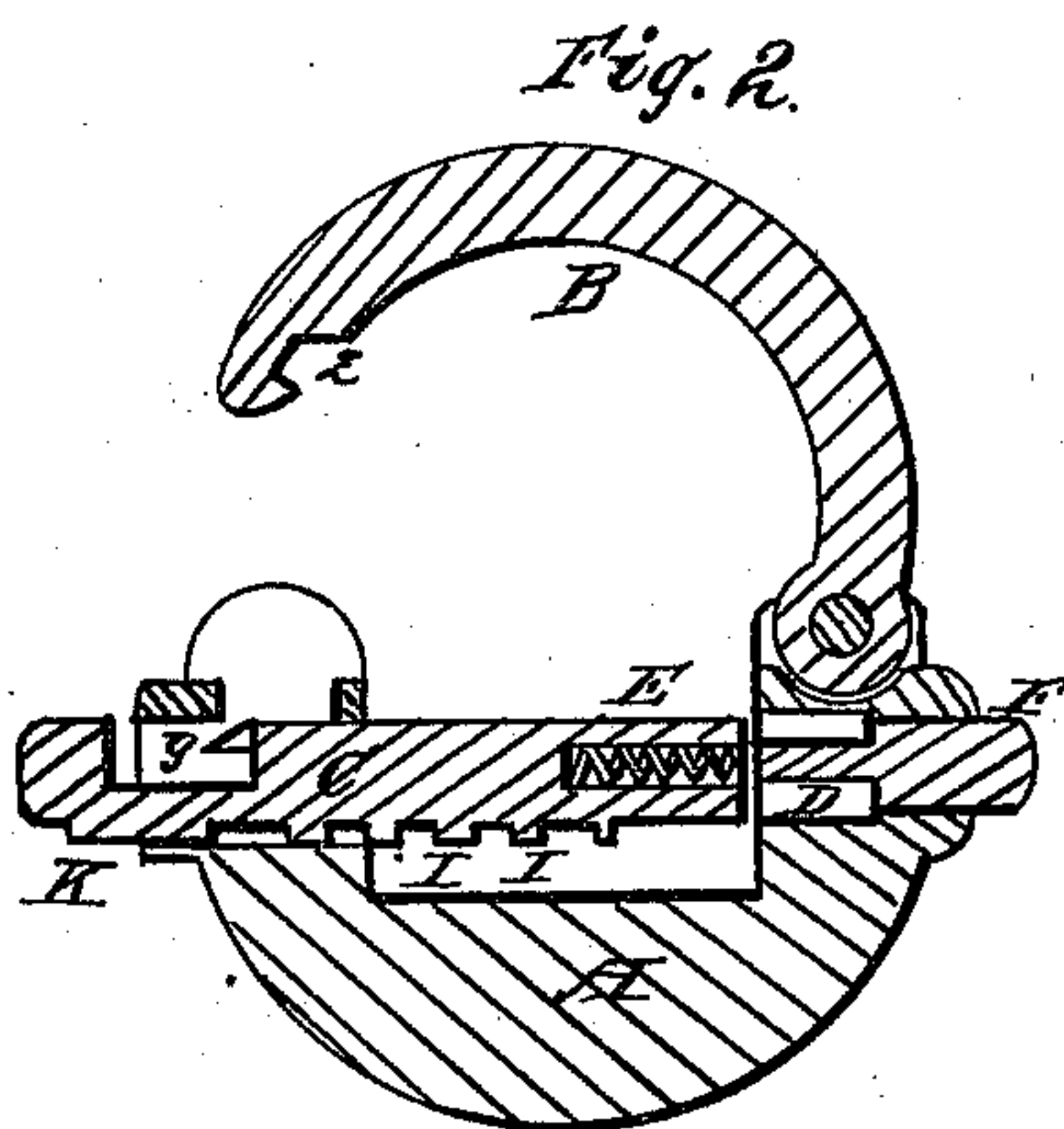
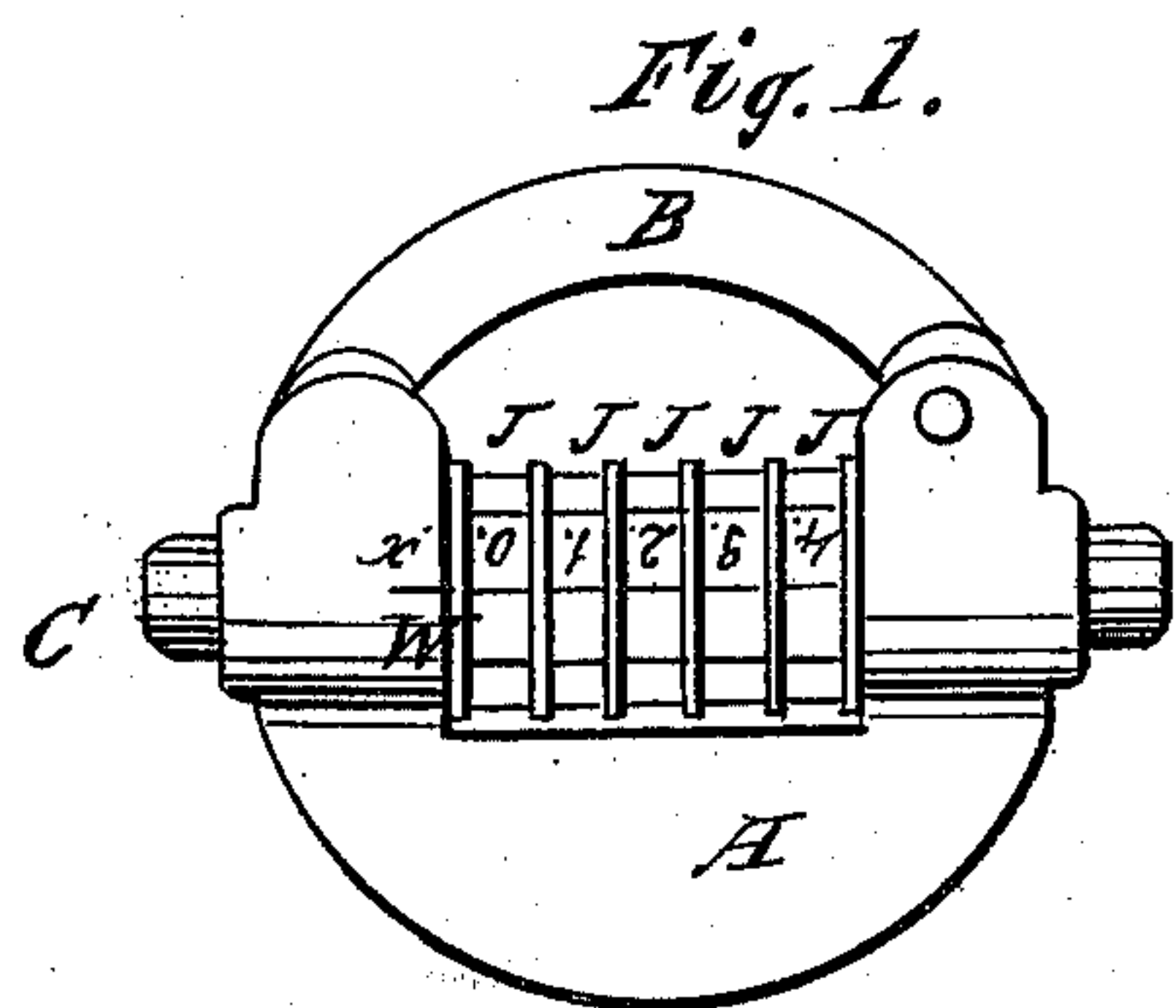


Fig. 3.

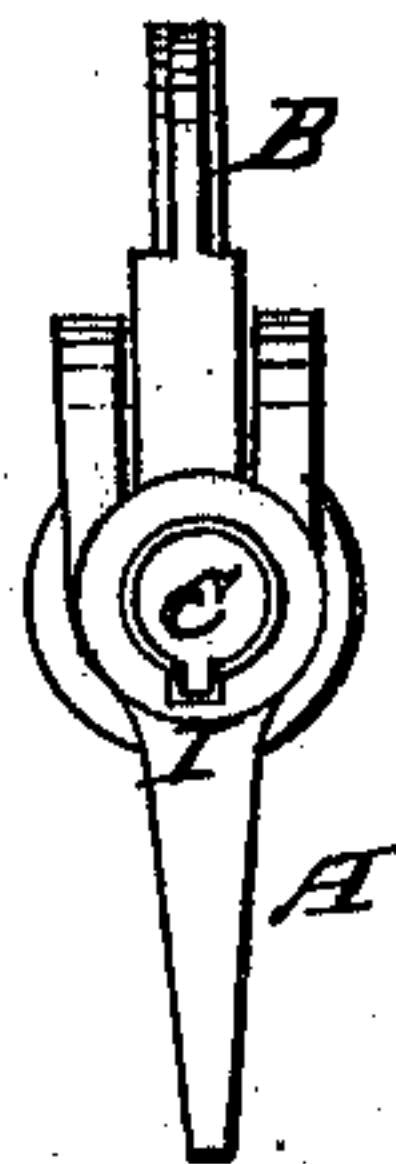
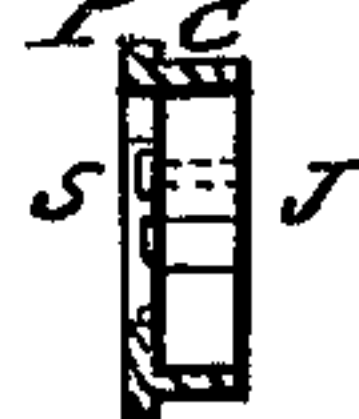


Fig. 4.



Fig. 5.



Witnesses:

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Letters Patent No. 89,826, dated May 4, 1869.

IMPROVEMENT IN LETTER-LOCKS.

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, HORACE L. ARNOLD, of the city of Chicago, in the county of Cook, and State of Illinois, have invented a new and useful "Improved Combination-Lock;" and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form part of this specification, and in which—

Figure 1 is a side elevation of my improved combination-lock.

Figure 2, a vertical section.

Figure 4, a plan of one of the tumblers

Figure 5, a sectional view of the same.

The same letters of reference refer to the corresponding parts in the different figures.

To enable those skilled in the art to make and use my invention, I will proceed to describe the same in detail.

The nature of my invention consists in the peculiar means of retaining the bolt C in its seat in the body A, and in the means of retaining, releasing, and removing the bolt and tumblers from the body of the lock, when it is desired to change the combination which opens the lock, the whole being an improvement upon the well-known "letter-lock."

My improved combination-lock consists of the body A, the shackle B, the bolt C, the tumblers J, and the washer W, together with the spring E, and its abutment F.

The body A consists of a web, carrying two uprights, separated by a distance equal to the aggregate thickness of the tumblers J and the washers W. Said uprights are bored to receive the bolt C, as shown in the drawing, one of them being bored entirely through, and having the spline L, to permit the passage of the projection I I on the bolt C, and to receive the projection K upon C, for purposes hereinafter specified, and each carry two lugs, one pair of which receives the pivoted end of the shackle B, while the other pair takes the other end when the shackle is in position to lock.

The body A has upon one of the uprights an index-mark, the use of which is hereinafter specified.

The shackle B is wholly of an ordinary construction, and is fully presented by the drawings.

The bolt C is of peculiar construction and operation.

It consists of a cylindrical body, provided with projections I I, which, when the tumblers are in locking-position, prevent its longitudinal movement, and with the projection K, which, in conjunction with the spline L in the frame A, prevents any rotary motion of C; further, the bolt C is recessed near its outer end, in such manner as to receive the end of the shackle B, and so as to form a projection, y, which engages with the notch z in the shackle, as shown, and the bolt C extends beyond the recess for the shackle so far as to protrude through the frame A, and the protruding portion is operated directly by the hand, to unlock the lock, while the slender portion left

at the bottom of the recess is so frail as to give way before the lock can be forced by blows delivered upon the exposed end of C.

The outward movement of C is effected by the spring E and its abutment F.

It is necessary that the spring E should, for a reason hereinafter specified, move within the bolt C at all times, as it is therefore retained in C, by having its inner coils enlarged.

The abutment F is a driving fit in its seat.

The washer W fills the important office of retaining the bolt C in its seat in the frame A, when the lock is unlocked, and consists of a thin disk of metal, of a diameter equal to the greatest diameter of the tumblers, bored to fit the bolt C, and splined to permit the passage of projections I I.

The washer W has also a line upon its outside face.

When this line coincides with the line upon the body A, the washer W is in such position that the projections I I will pass through the spline in W, and the bolt C may be removed wholly or partly from its seat in A.

When the washer W is placed upon the bolt C, having been previously passed through the upright, and when C has been pushed as far as possible inward, and W has been passed over all the projections I I, then if the washer W be turned either more or less than one whole revolution upon C, the outermost of the projections I I will strike the washer W, and keep C in its place.

But if W is turned so as to bring its spline in line with the projections I I, the spring E will either throw the bolt wholly out of its seat in the frame A, or so nearly out that it may readily be removed by the fingers; and upon the removal of C, the tumblers J are free from the remainder of the lock, and may be rearranged to form different locking and unlocking combinations at pleasure.

To avoid trouble in replacing the tumblers J upon the bolt C, the spring E is retained in its seat in C, as before described, and the abutment F is of such length as to stand a little below the inner face of the frame A.

This method of construction gives a lock which is simpler, stronger, cheaper, and much more easily operated than letter-locks previously made, as well as more agreeable to the eye.

The tumblers J are made of one piece of metal, with false notches, and are fully shown in the drawings.

The frame A and the washer W, and the projecting ends are so formed that the two sides of the lock have everywhere a similar outline, both in side and end views.

Operation.

The operation and manipulation of my improved lock are similar to the operation and manipulation of the old letter-locks.

To lock my lock, the true notches in the tumblers must be brought to the proper line, when the bolt may be pushed inward, either by the hand operating

upon the projecting portion thereof, or by forcing the end of the shackle against it. As soon as the shackle is down to its seat, the spring E causes the projection *y* to engage with the notch *z*, and the turning of one or more tumblers completes the locking.

To unlock my lock, the tumblers must be brought to the right number against the line on the frame, and the bolt pushed inward by the hand.

To change the combination, the lock is unlocked, and the washer W is turned until the line upon it coincides with the line upon the frame, when the spring E will force the bolt out, which leaves the tumblers loose in the hand, and free to be rearranged upon the bolt C at the pleasure of the operator.

Having thus fully described the construction and operation of my invention,

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

1. The combination of the bolt C, the spring E, and the abutment F, when constructed and operating as described, and for the purpose set forth.

2. The combination of the washer W with the bolt C, spring E, and abutment F, when constructed and operating as described, and for the purpose set forth.

HORACE L. ARNOLD.

Witnesses:

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