A. T. & E. O. BOONE.

Combination and Seal Lock Bolt.

No. 196,329. Patented Oct. 23, 1877.

Fig. 1.

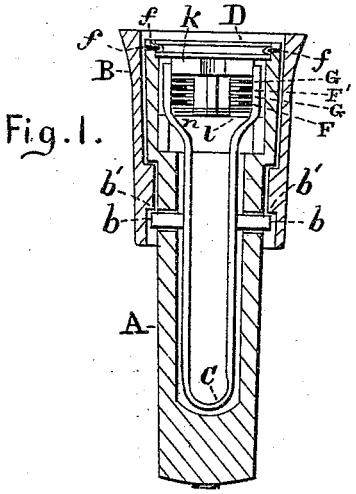


Fig. 2.

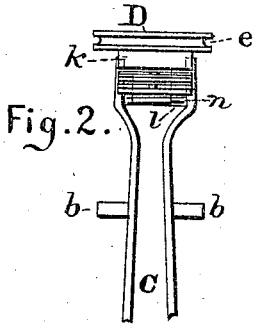


Fig. 3.

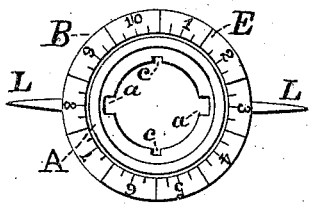


Fig. 5.

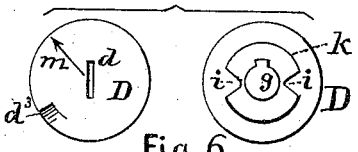


Fig. 7.

Fig. 8.

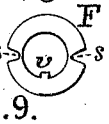


Fig. 9.

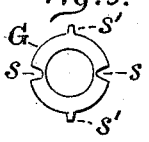


Fig. 6.

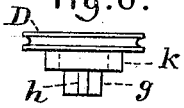


Fig. 4.

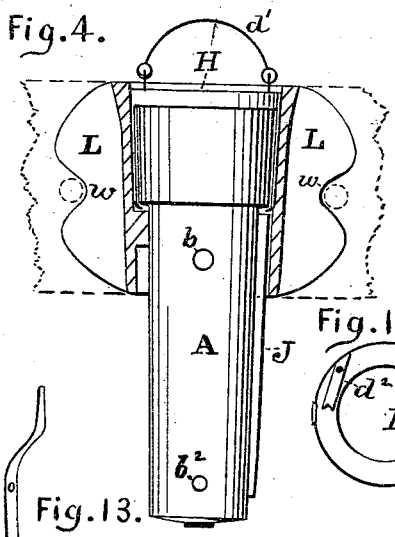


Fig. 10.

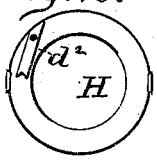


Fig. 13.

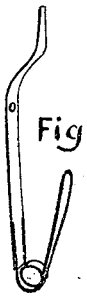


Fig. 14.

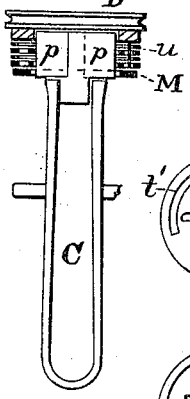


Fig. 15.

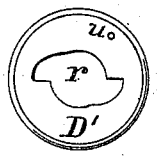


Fig. 16.

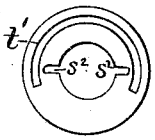


Fig. 17.

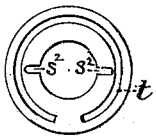


Fig. 11.

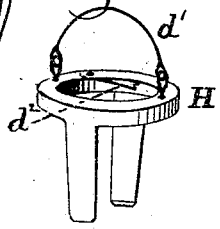


Fig. 12.

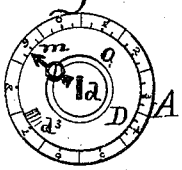
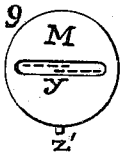


Fig. 18.

Fig. 19.



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UNITED STATES PATENT OFFICE.

ALONZO T. BOONE AND EDWARD O. BOONE, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN COMBINATION AND SEAL LOCK BOLTS.

Specification forming part of Letters Patent No. **196,329**, dated October 23, 1877; application filed March 28, 1877.

To all whom it may concern:

Be it known that we, ALONZO T. BOONE and EDWARD O. BOONE, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Combination and Seal Locks; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a vertical section of our improved combination seal-lock. Fig. 2 is a side view, showing lock-spring and ring-tumblers when unlocked. Fig. 3 is a top view of the lock-bolt within the socket. Fig. 4 is a side view of the lock, with the seal-holder attached. Fig. 5 represents a plan of the cap-piece, and the under side of same. Fig. 6 is a side or edge view of the cap-piece. Figs. 7 and 8 represent the annular plates or ring-tumblers. Fig. 9 is one of the washers. Fig. 10 shows the under side of the seal-holder. Fig. 11 is a perspective view of the seal-holder. Fig. 12 represents the cap-piece constructed with an adjustable dial-pointer. Fig. 13 shows a modification of the lock-spring. Fig. 14 shows a further modification of the lock-spring. Fig. 15 shows a plan of the under side of the cap in a modified form. Figs. 16 and 17 show modified forms of the ring-tumblers. Fig. 18 shows a modification of the washers. Fig. 19 represents a stay-plate to be used with one form of lock-spring.

This invention relates to seal-locks, more particularly such as are used on cars, bonded and other warehouses, or as railway-switch locks; and consists in certain improvements in the construction of the same, as hereinafter described and claimed.

In the drawings referred to, A designates a hollow bolt, formed to be placed in a socket, B, the latter being set in the door of a car or other structure. The said bolt is made either round, square, or of any suitable shape, and has recesses *a* and *c* formed in the inner sides.

Within the bolt A is placed the lock-spring C, having two arms extending upward, as shown in Figs. 1 and 2, said arms having one or more catches, *b*, to project through holes in the sides of the bolt for the purpose of locking against the shoulder b^1 on the inner side of the socket B.

D is a cap-piece, provided with a slot or aperture, *d*, and which fits in the top of the bolt, and rests on a shoulder. Said cap-piece has a groove, *e*, into which project the screws or rivets *f*, to hold it in place, and at the same time allow the cap to be turned. On the under side of the cap D is formed a plate, *k*, having the notches *i* formed to receive the upper ends of the arms of the spring C. From the center of the plate *k* the key *g* projects downward, having a feather or projection, *h*, formed thereon.

Within the bolt A, and resting on a shoulder, *l*, are placed a number of annular plates or ring-tumblers and washers, so that the key *g* passes through them.

In the drawing herewith submitted, the invention is shown with two of these tumblers and two washers, but a greater or less number may be used in forming the combination-lock. The forms of the two ring-tumblers are shown in Figs. 7 and 8, and the form of the washers is shown in Fig. 9. These tumblers and washers all have notches *s* in their outer edges to receive the arms of the lock-spring C. The washers also have the projections s^1 to enter the recesses *c* inside the bolt. The tumbler F has a feather, *v*, formed on the inner edge of the rim, and two similar projections, *v'*, are formed on the inner edge of the tumbler F', as shown in Figs. 7 and 8. Instead of the two projections *v'*, one may be formed occupying the same space as the two, and used with a like result.

When placed in position within the bolt A, the tumblers and washers surround the key *g*, and are grasped between the upper ends of the spring-arms, the latter being formed to spring inwardly, requiring an outward pressure to expand the spring-arms and cause the catches *b* to lock against the shoulder b^1. Such expansion of the spring-arms is caused by turning the plate *k*, which moves them out of the notches in the plate and tumblers into the recesses *a*.

One of the washers G is placed next to the plate *k*, and next below this washer are placed the tumblers F F', with another washer, G, be-

tween them. (See Fig. 1.) To keep them in place, and allow a little yielding for sudden pressure, a spring, *n*, is placed underneath, and rests on the shoulder *l*.

As shown in Figs. 1 and 2, the arms of the spring C are expanded, and the lock is fast; but when sprung toward each other the lock is unlocked, the ends sinking in the notches in the ring-tumblers and washers, so that, in order to unlock, it is necessary that the notches *i* and *s*, on each side of the series of plates, washers, and tumblers, should be arranged on a straight line. This is effected by means of the cap D and key *g*, having the projection *h*, the latter catching the feathers *v v'* on the ring-tumblers as the cap D is turned around.

E is a dial on the upper edge of the socket B, said dial to be used in connection with the index or pointer *m* on the cap D to regulate the movement of the cap. As a modification in construction, this dial may be made on the upper edge of the lock-bolt A.

When the lock is fast, it requires several movements to bring the plate *k* and the tumblers in proper position to allow the spring C to withdraw the catches *b*. The cap D is first turned to the right and the dial-pointer *m* is set at a certain mark on the dial. It is then turned to the left a certain number of points, and again turned to the right, stopping with the pointer at a certain mark. These movements of the cap bring the plate and ring-tumblers in position, so that the arms of the lock-spring are allowed to spring into the notches *i* and *s*, withdrawing the catches *b* and allowing the lock-bolt to be pulled forward.

A modification in the construction of the cap, lock-spring, ring-tumblers, and washers is shown in Figs. 14, 15, 16, 17, and 18. In Fig. 14, the spring C is shown with the upper ends of its arms having the flat pieces *p*, which project past each other and operate in a sunken cam, *r*, in the under side of the cap D', so that when a turn of the cap presses the pieces *p* inward the spring-arms are expanded, and when the pieces *p* occupy the longest distance in the cam the spring-arms are allowed to contract. The ring-tumblers used in connection with this are shown in Figs. 16 and 17, having the slits s^2 on their inner edges, to receive the flat pieces *p*, and each tumbler has an annular slot, one slot, *t*, being longer than the slot *t'* in the other tumbler. A pin, *u*, projecting from the under side of the cap, passes through the slots *t t'* when the tumblers are in position, and forms the key which operates them. The washers, the form of which is shown in Fig. 18, each has a projection, *z*, to enter a recess in the bolt to hold it in position.

When the construction shown is used as a seal-lock, a piece of paper or other material is placed on the face of the cap D, and the seal-holder H is slipped on the upper part of the bolt A, as shown in Fig. 4. The said holder H is provided with a bail, d^1, or a swivel, for withdrawing the lock-bolt, and also has a small spring, d^2, attached underneath, so as to spring into a notch or depression, d^3, in the face of the cap D, to revolve the cap D by means of bail d^1, or a swivel attached to the seal-holder in operating the lock.

The socket B has wings L made solid therewith, and extending from the sides of the socket, as shown, these wings having notches or depressions *w*. A hole is made in the door of the structure of suitable size to receive the socket, which is then driven in, the wings L making their way into the grain of the wood. Bolts are then passed through the door, going through the notches *w*, as indicated in Fig. 4, and hold the socket, preventing its being withdrawn.

A rib, J, formed on the bolt A in a corresponding groove in the socket B, serves to keep the two parts in their relative positions, and the pin b^2 prevents the bolt from being entirely detached from the socket.

The cap D may be constructed with an adjustable pointer, so as to be fixed at any mark or number on the dial. An annular groove, *o*, is made in the face of the cap, having a dovetail therein, to which the pointer *m* is secured by a screw which permits it to be adjusted and fixed at any point on the dial. (See Fig. 12.)

A modification of the lock-spring C is shown in Fig. 13, the spring being constructed with one arm instead of two.

When the lock-bolt A is constructed to be used without the socket B or the seal-holder H, the dial is stamped on the upper edge of the bolt A, as shown in Fig. 12.

The lock may be adapted to ordinary hinged doors by constructing the door with a hasp on its edge, to fall, as the door closes, into a corresponding recess in the door-casing. An aperture through the door-casing and hasp, conforming to the bolt, admits the same, when it may be secured by the means above described.

In using the lock-spring shown in Fig. 14, a stay-plate, M, having a slot, *y*, to inclose the pieces *p* and projection *z'*, is placed just below the ring-tumblers. (Shown in Figs. 16 and 17.)

Having described our invention, we claim—

1. A hollow bolt having a dial on its end, in combination with a lock mechanism on the inside of the bolt, substantially as and for the purpose set forth.

2. The socket in combination with the hollow bolt provided with a rib, J, and a combination-lock mechanism, whereby the bolt is secured to the socket, substantially as described.

3. The seal-holder provided with the spring d^2, in combination with the notch or depression d^3 on the rotating cap D of the bolt, and the socket B, substantially as described.

4. A hollow bolt having a dial and rotating cap provided with a dial-pointer, in combination with a lock mechanism on the inside of the bolt, substantially as and for the purpose set forth.

5. The cap D, provided with an adjustable

dial-pointer and a recess or hole, *d*, in its face, and groove *e* in its edge, in combination with guide-screws or rivets *f* of the bolt, substantially as set forth.

6. The cap D, provided with the groove, in combination with the hollow bolt and guide-screws *f*, as and for the purpose set forth.

In testimony that we claim the foregoing as our own we do affix our signatures in presence of two witnesses.

ALONZO T. BOONE.
EDWARD O. BOONE.

Witnesses:
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JAS. R. JUDSON.