(No Model.)

E. TYDEN.

SELF LOCKING SEAL.

No. 594,580. Patented Nov. 30, 1897.

Fig. 1.

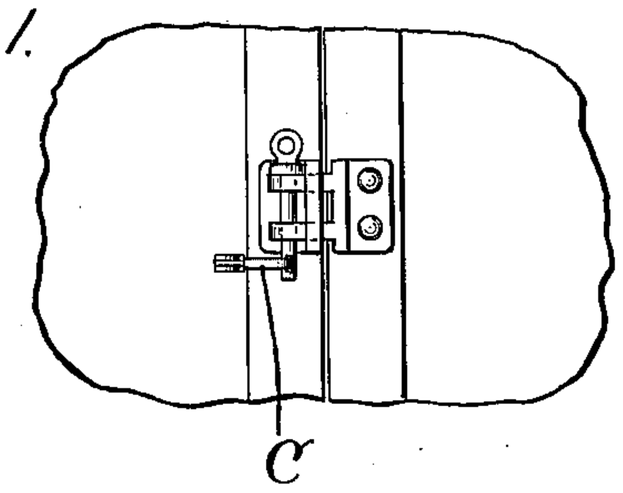
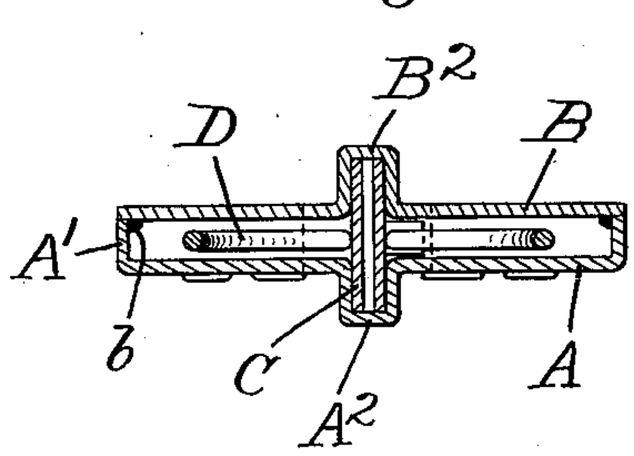


Fig. 6.



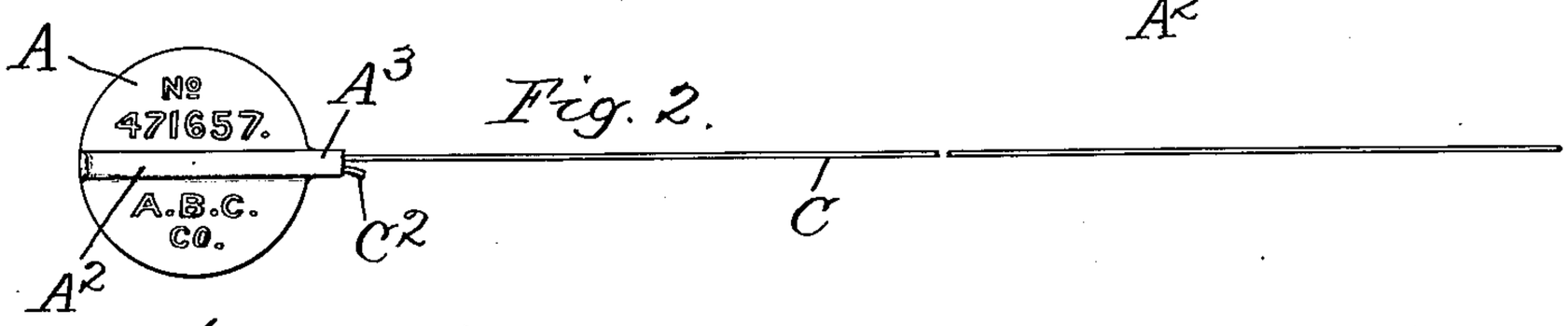


Fig. 2.

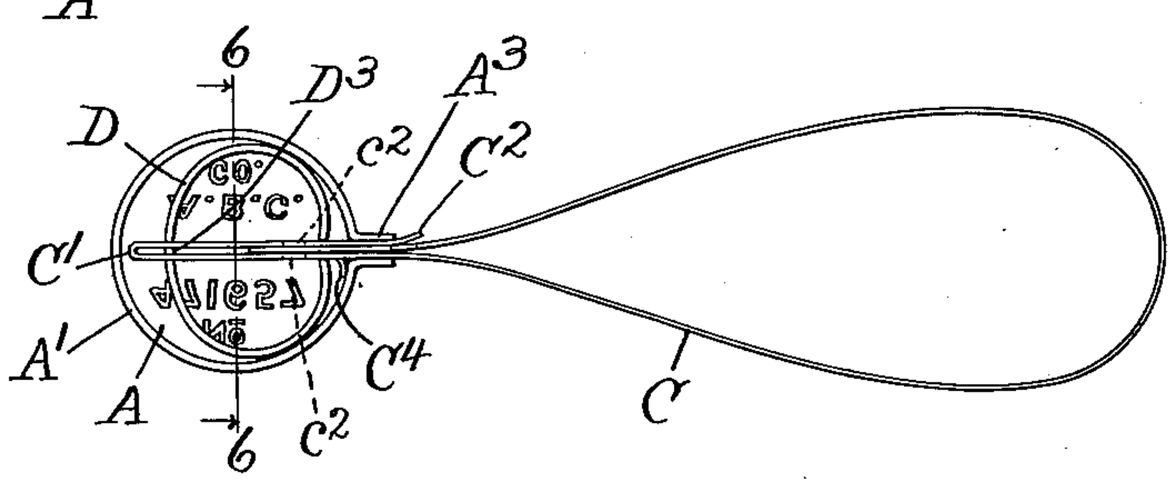


Fig. 3.

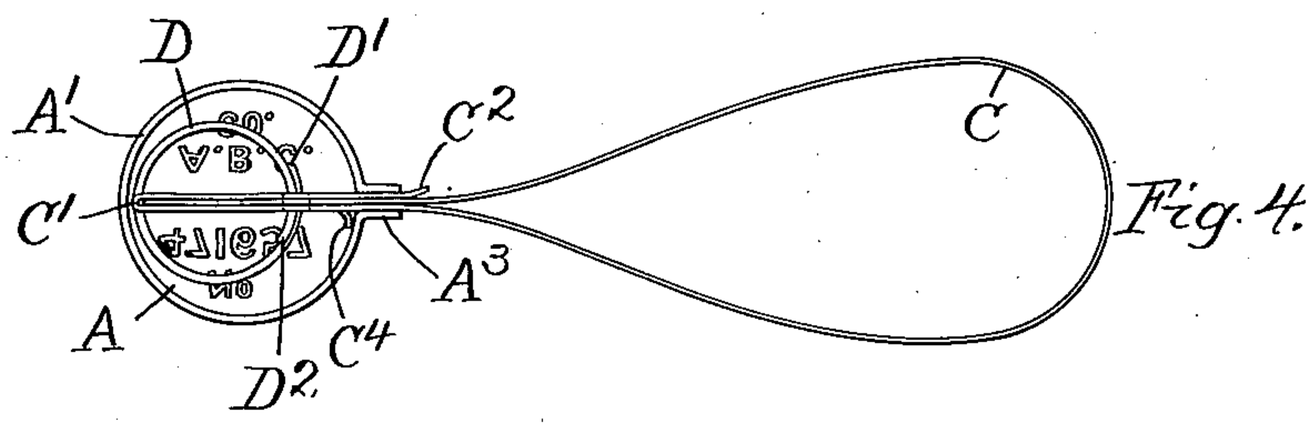


Fig. 4.

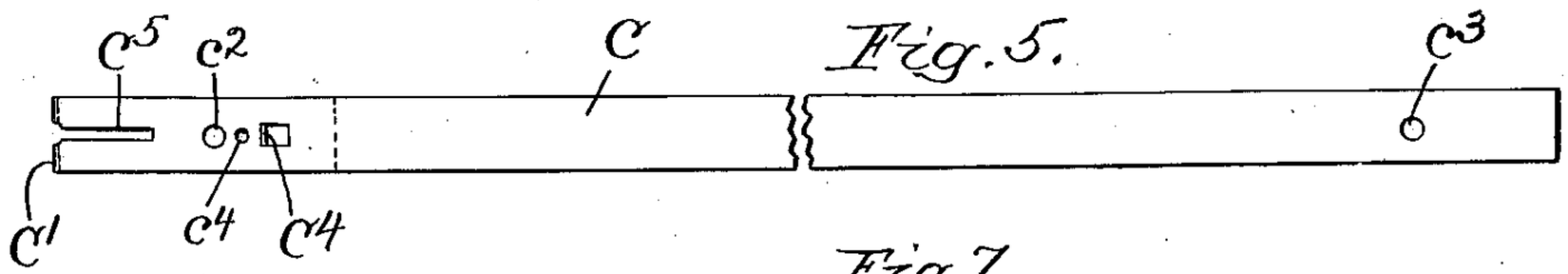
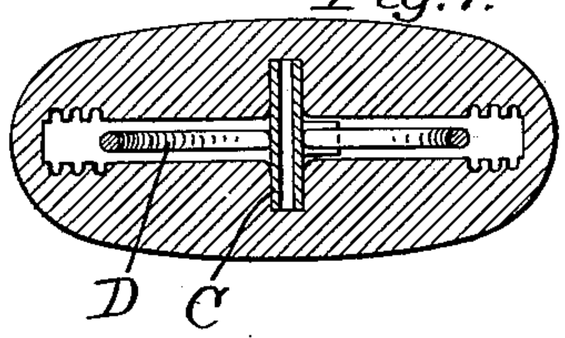


Fig. 5.

Fig. 7.



Witnesses.
E. T. Wray.
Jean Elliott.

Inventor.
Emil Tyden
by Burton & Burton
his attys.

UNITED STATES PATENT OFFICE.

EMIL TYDEN, OF CHICAGO, ILLINOIS, ASSIGNOR TO JOHN A. JOHNSON, OF SAME PLACE.

SELF-LOCKING SEAL.

SPECIFICATION forming part of Letters Patent No. 594,580, dated November 30, 1897.

Application filed February 4, 1897. Serial No. 621,966. (No model.)

To all whom it may concern:

Be it known that I, EMIL TYDEN, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Self-Locking Seals, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved device in the nature of a seal of a class commonly used to seal bags, packages, and the like, wherein a securing device, which is most frequently a flexible strap, usually of metal, is engaged with the package to be sealed or the lock which secures it, and the ends of such device, if it is a strap, are then united by a seal, which must be broken before they can be severed, so that the unlocking or fastening of the package will be evidenced by the breaking of the seal or the strap.

In the drawings, Figure 1 represents a seal of the class to which my invention belongs in the position of use securing a bolt or key used to lock a bag. Fig. 2 is a plan of my improved seal in the condition prior to use. Fig. 3 is a view showing the condition of the seal after the securing device is engaged and the end partly entered in the lock before the full entry which causes it to become engaged and secured, the outer plate of the seal being removed to show the interior structure. Fig. 4 is a similar view showing the locking device fully engaged with the inserted end of the securing device and the seal fully locked. Fig. 5 is a side elevation of a tie or strap, of sheet metal, which constitutes the securing device pertaining to the lock. Fig. 6 is a transverse section through my improved seal at the line 6 6 on Fig. 3 on an enlarged scale. Fig. 7 is a similar view representing the seal, however, as made of glass or like material and having the case rendered integral in the process of manufacture.

I will first describe the form shown in the principal figures, wherein the seal-case is represented as made of sheet metal. The body or case is made in two parts A and B, one of which may be cupped or flanged, so as to comprise the edge A′ of the case, the other being substantially a disk joined by soldering or otherwise, as at *b*, to the edge of the marginal flange A′ of the part A. Each of the parts A and B is provided with a diametrical channel or recess, forming, when it is made of sheet metal, exterior ribs A^2 and B^2, said channel-ribs extending beyond the margin at one end and constituting a throated neck A^3, whose throat leads into the cavity of the seal, which in cross-section is an oblong parallelogram, whose greater dimension is in a plane at right angles to the disks. The strap C is folded upon itself at C′, the reflexed end portion C^2 being sufficiently greater than the diameter of the seal, so that when the fold is lodged in the seal, as seen in Fig. 3, the end C^2 will protrude. The thickness or lesser dimension of the oblong aperture through the neck A^3 of the seal is only sufficient to admit, in addition to the two thicknesses of the strap formed by the folding back of the end C^2, as described, one additional thickness, and the throatway is thereby reduced, so that there is only room to insert the other end of the strap between the two folds, as seen in Fig. 3. A lug C^4 is struck from the strap at a distance from the fold C′ substantially equal to the inner diameter of the seal-cavity, so that when the folded strap is lodged edgewise in the neck A^3 before applying the cap B the lug C^4 prevents the longitudinal withdrawal of the strap.

D is a coiled spring, preferably of very hard steel-wire, consisting of more than one complete coil, so that the two ends D′ and D^2 lap by each other a little distance.

The strap C is provided with a slot C^5, which is cut through the fold C′, as illustrated in Fig. 5, and a little farther back from the fold both thicknesses of the strap are apertured, said apertures c^2 and c^2 coinciding. A third aperture c^3 is provided in the strap at a distance from the other end, which is substantially equal to the distance of the apertures c^2 and c^2 from the fold C′.

In assembling the parts the spring D is spread so that the two folds of the folded strap can be entered between the ends, and in this condition the ring is passed up into

the slot C^5, and the ends thus sprung apart are lodged at opposite sides of the two folds above the apertures c^2 and c^2, as seen in Fig. 3. Preferably slight depressions or seats are formed for the ends of the spring on the outer faces of the strap, as illustrated at c^4 in Fig. 5. This, however, is a mere precaution to diminish the liability of dislodgment by accident. In this condition the strap, with the spring attached thereto, as described, is lodged edgewise in the neck A^3, and the cap B is placed in position and united by soldering or otherwise to the part A. In use, after the strap has passed through around the package fastening or bolt which is to be sealed the end is inserted in the fold under the end C^2 and pushed in until it strikes the spring-wire D, where the latter crosses the slot C^5 at D^3, and then, being still farther pushed inward, the two ends of the spring are dragged over the surface of the strap until they enter the apertures c^2 c^2, whereupon immediately the spring closes up elastically, the ends lapping by each other and protruding through the aperture c^3, and usually by the reaction the spring flies around in the case, so that the position of the lap is a matter of chance. It will be seen that in this condition the two ends of the strap are engaged by the spring-wire and cannot be disengaged without rupturing either the wire or the strap. The three thicknesses of the strap which pass through the neck A^3 completely occupy the space therein, and the mode of use is such that they may make a very snug fit, precluding the possibility of introducing between them or on either side of them any tool which could in any event be used to pick the lock if it could be picked, or to sever the wire if it could be severed; but the strap being made of soft and light metal and the spring D being made of very hard wire it would be impossible, even with a very stiff flat tool introduced between the straps, to cut the wire, and the result of an attempt would be to merely drive it through the strap, tearing the latter in the same manner as it would be torn if the seal were forcibly pulled off.

Any attempt to tease the wire around or spread the ends so as to disengage it from the ends of the strap to which it extends would be prevented by the fact that the spring is perfectly free to move, no point being fixed, and therefore there is no means of getting a purchase upon it. Even an attempt to get at the wire by drilling in through the edges of the seal would be ineffectual, because it would be necessary to first get the lap of the wire in the vicinity of the eyes c^2 c^2, and then to obtain purchase on the spring with chance to spread it by pressure at the same time from within outward on the two halves which are on opposite sides of the strap. In order to do this, the tool introduced for the purpose from one edge of the seal would have to be inserted entirely through both ends of the strap in order to reach and press upon the opposite half of the wire, and the tool would thereby become a complete means of locking the strap.

The essential feature of the device in respect to the locking-spring is that the spring is not secured, but is free to move, and however it moves does not escape from the apertures c^2 c^2. The best form of this seal, all things considered, I regard as that shown in Fig. 7, wherein the seal is made of glass or some similar substance instead of being made of sheet metal. The mode of construction would be to make, by casting or pressing in a mold, two parts with the interior form substantially the same as when made of sheet metal, the exterior being preferably as free from irregularities as possible. In the part A the strap and spring will be lodged, as already described, and the part B being applied, both parts being at the proper temperature to unite, (if made of glass,) the seal will virtually be integral when completed. Similar results may be obtained with other substances of such nature that the two parts of the case may be cemented together. The advantage of any vitreous material would be obvious—to wit, that the seal cannot be penetrated by a tool and that, being broken or ruptured, it cannot be repaired to prevent the rupture being obvious.

When the seal is made of sheet metal, the number or other mark of identification will be embossed by striking up from the inside before the two parts of the case are assembled, and the same method may be employed when it is made of glass—that is to say, the imprint of the number may be formed on the inside in the process of molding, though the result would not be an embossing or upraising of the letter on the outside. Any pigment used to fill the depression thus formed in the interior will make the letters legible from the exterior, even though the glass be not transparent to such extent as to make it possible to discover the position of the spring; but in case of a seal made of glass even transparency will not make it possible to pick the lock. When transparent glass is used, I prefer to make the seal exteriorly sufficiently convex, especially toward the periphery, to give it considerable magnifying power, so that the letters imprinted upon the inner surface, though moderately small, will be magnified when seen through the glass and may therefore be more easily read at a distance.

Preferably in order to increase the difficulty of picking after forcibly penetrating the shell (when made of sheet metal) the spring D when spread, as in Fig. 3, should touch the walls of the chamber on opposite sides and bear somewhat tightly against them, so that any attempt to spread the ring, even if pressure could be applied to both sides to spread it, would be useless unless the wire could be positively engaged at both sides, so that the operator could not merely push it apart, but in addition could pull the ends apart after the

sides had touched the wall of the chamber, and this, it is believed, in practice would be an impossibility.

Upon analysis of this structure it will be noticed that the portion of the strap C comprising the reflexed end C^2 and the portion of the strap upon which it is reflexed constitute a guard to detain the engaging device out of the path of the intruded end of the securing device until that encounters the engaging device at a point remote from its engaging ends and moves it to the apertures in the guard; and it will be obvious to any mechanic that the making of this guard in one piece with the strap which constitutes the securing device, and thereby making it serve as a means for attaching the strap to the seal-body, is a matter of convenience and cheapness of manufacture; and it will be evident also that the use of the looped strap as the securing device is not obligatory, but that any device which can be rendered undetachable from the package or lock which it is intended to guard by having the seal appended to it may be employed by having its end properly formed to be inserted into the guard, as described.

I claim—

1. In a seal, in combination with a chambered body, a securing device adapted to be inserted thereinto and an engaging device lodged unattached in the chamber and completely inclosed therein, such engaging device being a spring adapted to be encountered by the intruded securing device and to react automatically into engagement therewith.

2. In a seal, in combination with the chambered body, a securing device adapted to be inserted thereinto and to substantially close the aperture through which it is inserted; an elastically-operating catch lodged within the chamber adapted to engage the securing device back of its intruded end; a guard which detains the engaging end of the catch out of the path of the intruded securing device; said guard and catch being relatively movable and one of said parts being extended into the path of the intruded securing device and adapted to be encountered thereby and moved relatively to the other part to cause the disengagement of said parts to permit the catch to engage the securing device.

3. In a seal, in combination with a chambered body, a securing device adapted to be inserted thereinto and to substantially close the aperture through which it is inserted; an elastically-operating catch lodged within the chamber adapted to engage the intruded securing device; a guard which detains the engaging end of the catch out of the path of the intruded securing device, the catch being extended into the path of said intruded securing device and adapted to be encountered thereby and disengaged from the guard.

4. In a seal, in combination with a chambered body, a securing device adapted to be inserted thereinto, and when fully inserted to close the aperture through which it is inserted, an engaging device lodged unattached within the chamber and wholly inclosed thereby, such engaging device being adapted to be encountered by the intruding securing device, and to react automatically into engagement with the latter when so encountered.

5. In a seal, in combination with a chambered body, a securing device adapted to be inserted into the chamber and to fill the aperture through which it is thus inserted; and a spring which normally coils with its ends lapped lodged within the chamber, and a device within the chamber which holds the ends of the spring separated to permit the inserted securing device to pass between them, the locking device having an aperture back of its inserted end and adapted after entering between said ends to withdraw them from the separating device, whereby the spring may be coiled through said aperture.

6. In a seal, in combination with a chambered body having a throated neck whose throat constitutes the only access to the chamber, a securing device adapted to be inserted through such throat and to substantially fill the same; a spring coiled so that normally its ends lap lodged within the chamber; and a device fixed with respect to the chamber-wall adapted to hold the ends of the spring separated and on opposite sides of the throatway, the securing device having an aperture in its inserted portion at a distance back from the end equal to the diameter of the coiled spring, whereby, when inserted through the throatway, it passes between the separated ends and encounters the opposite side of the coil and pulls its ends off the separating device, whereby the ends lap through said aperture.

7. In a seal, in combination with the body having a shallow or flat chamber and a groove or channel transverse with respect to the flat chamber and a neck provided with a throatway corresponding to the cross-section of the groove or channel, such throatway constituting the only entrance into the chamber; a securing device adapted to be inserted through the throatway into the groove and to completely close the throatway when thus inserted, a spring coiled so that normally its ends lap lodged unattached in the flat chamber and adapted to extend on both sides of the plane of the groove; guards extending from the opposite sides of the throatway respectively adapted to hold the ends of the spring separated; the securing device having an aperture back of the end which is inserted through the throat a distance substantially equal to the diameter of the spring, whereby, upon its insertion through the throat, it passes between the separated ends and encounters the opposite side of the spring and pulls it off of the separating device and is engaged by the lapped ends of the spring through its aperture.

8. In a seal, in combination with the chambered body A, B, having transverse recesses,

the securing device consisting of the strap having one end folded upon the other and the folded portion permanently secured in the transverse recess and having coinciding apertures within the chamber; the spring D coiled so that its ends lap, and lodged unattached within the chamber and having its ends separated by and bearing against the opposite sides of the folded strap, the opposite end of the strap being adapted to be inserted between the folds of the permanently-secured end, and provided with an aperture at a distance back from its end substantially equal to the diameter of the spring, whereby when thus inserted it passes between the separated ends and encounters the opposite side of the spring and disengages the separated ends and receives them lapped through its aperture.

9. In a seal, in combination with the chambered body A, B, having transverse grooves constituting a seat for the securing device, and a throatway leading from the seal-chamber; the securing device consisting of a strap folded upon itself at one end and notched longitudinally through the fold and having the coinciding apertures c^2 c^2 back of the notch, such folded end being lodged in the transverse grooves and permanently secured within the seal and extending therefrom, the outer portion of the strap having an aperture back of the outer end a distance approximately equal to the diameter of the coiled spring D, and adapted to coincide with the apertures c^2 c^2 when said end is inserted between the folded portions.

10. In a seal, in combination with the chambered body, the securing device consisting of a strap adapted to be inserted into such body and to close the aperture through which it is thus inserted and having an aperture in the inserted portion; a spring normally coiled so that its ends lap lodged within the chamber, and a device therein which holds the ends of the spring separated to permit the inserted securing device to pass between them and afterward dislodge them and receive the lapped ends through its aperture, said spring, when spread to separate its ends, being in contact at opposite sides with the edge walls of the chamber.

In testimony whereof I have hereunto set my hand, at Chicago, Illinois, in the presence of two witnesses, this 1st day of February, 1897.

EMIL TYDEN.

Witnesses:
JEAN ELLIOTT,
LILLEY W. JOHNSTONE.