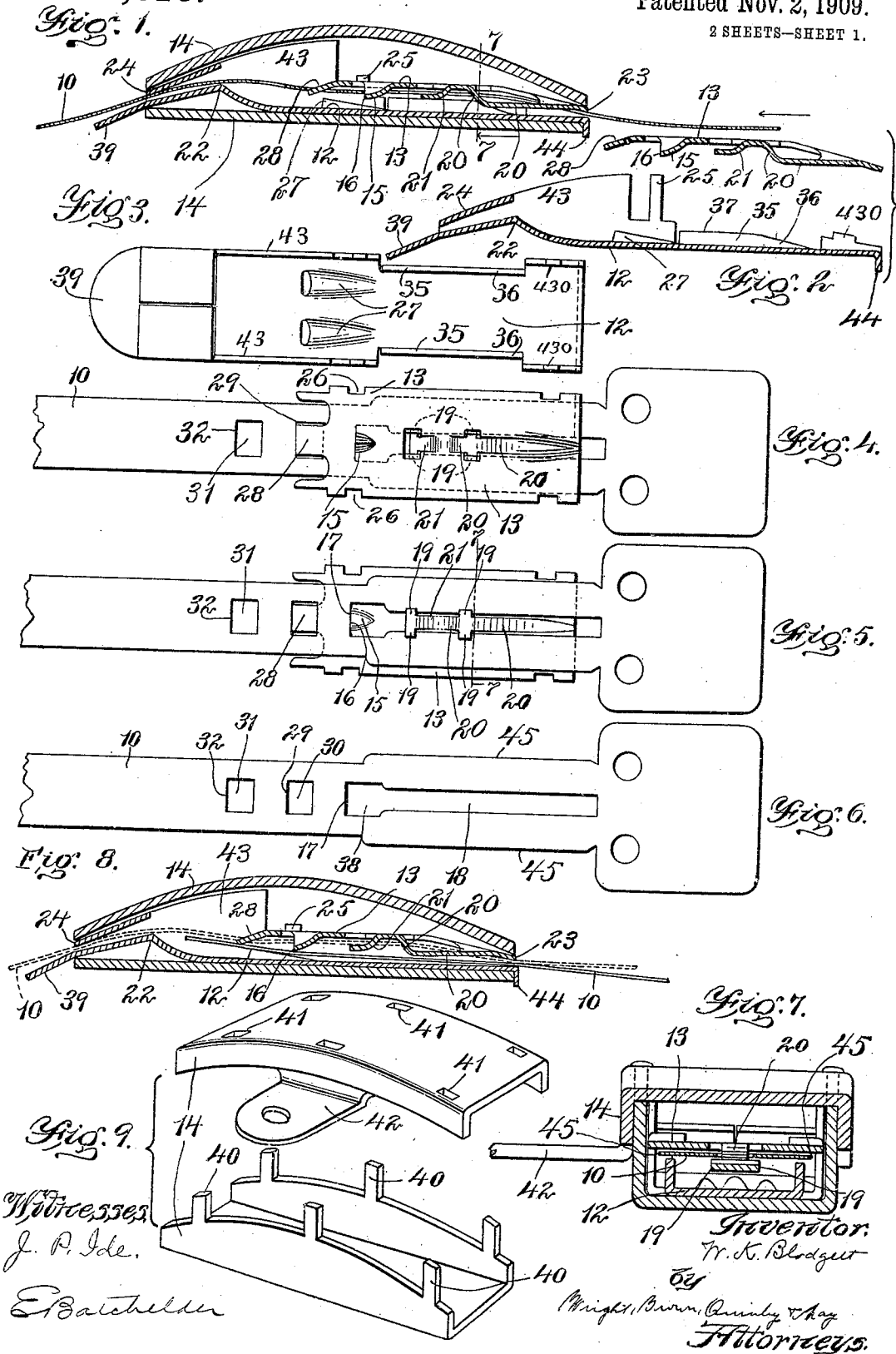


W. K. BLODGETT.
SEAL LOCK.
APPLICATION FILED AUG. 18, 1905.

938,813.

Patented Nov. 2, 1909.
2 SHEETS—SHEET 1.



Witnesses
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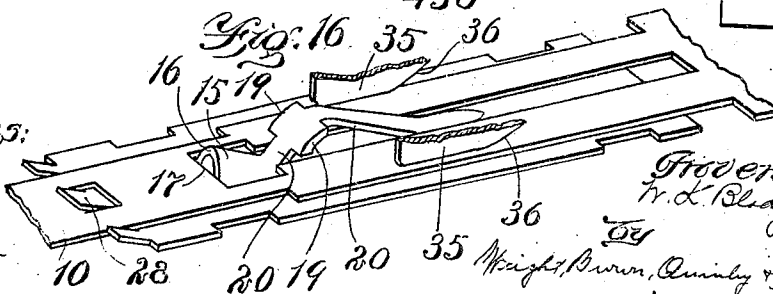
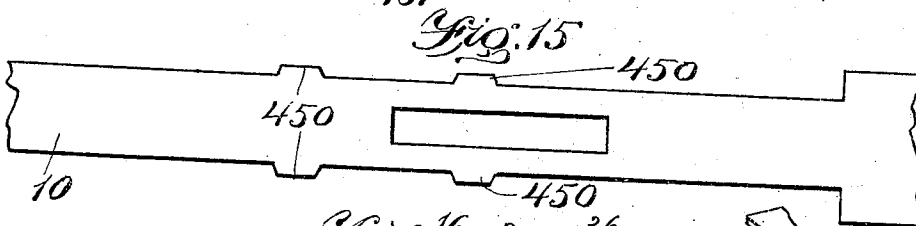
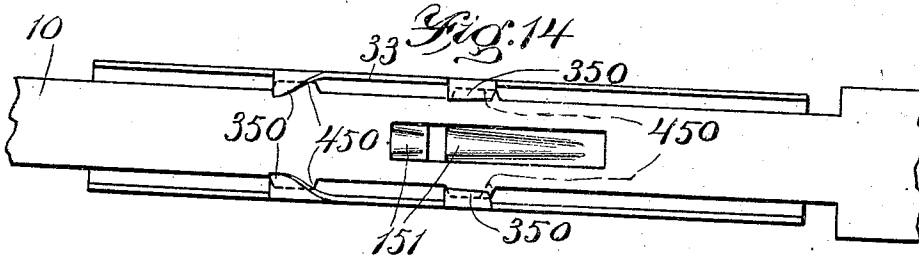
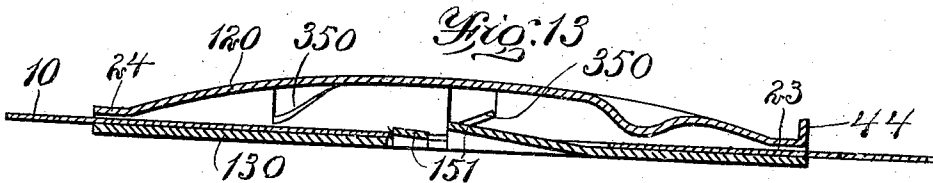
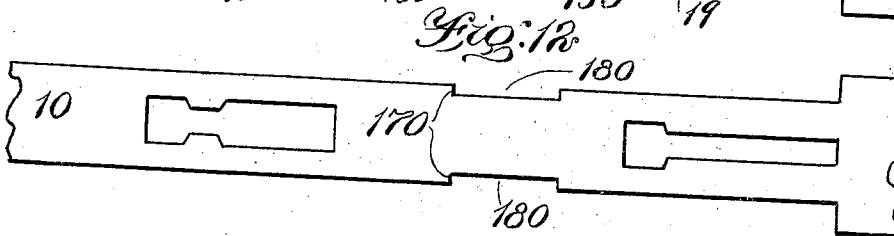
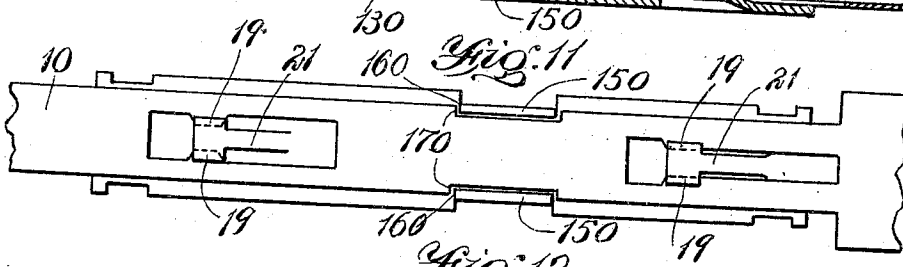
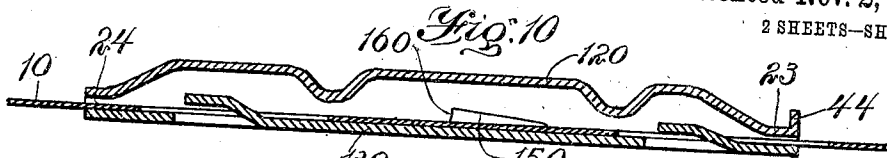
W. K. BLODGETT.
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

WARREN K. BLODGETT, OF CAMBRIDGE, MASSACHUSETTS.

SEAL-LOCK.

938,813.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed August 18, 1905. Serial No. 274,695.

To all whom it may concern:

Be it known that I, WARREN K. BLODGETT, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Seal-Locks, of which the following is a specification.

This invention relates to seal locks for use in securing transportation companies against the unauthorized opening of doors of freight-cars and other receptacles, and particularly to that class of seal locks embodying a lock-casing and a seal-strip of resilient material, such as sheet metal, the casing and seal-strip being provided with locking members which automatically interlock by the operation of inserting the resilient seal-strip into the casing, the object being to prevent the withdrawal of the seal-strip from the casing without breaking or severing the seal-strip. In most seal locks of this character heretofore made, so far as I am aware, the construction has been such that it has been possible to pick the lock, or in other words, disengage the seal-strip from the locking members of the device, by the insertion of a thin flexible strip beside the seal-strip. The defect is due mainly to the fact that the strip-receiving passage of the device is necessarily widened or enlarged between the ends of the lock to permit the sidewise flexure of the seal-strip within the passage to the extent required to interlock the seal-strip with the locking member or members. This freedom of sidewise flexure of the seal-strip enables it to be fraudulently flexed in such manner as to disengage it from the locking members.

My invention has for its object to obviate this objection and prevent sidewise flexure of the seal-strip or movement out of its proper plane within the casing, after it has been locked, to the extent required to disengage it from the locking member or members.

To this end my invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, representing slightly varied embodiments of my invention, Figure 1 represents a longitudinal section of a seal lock embodying my invention. Fig. 2 represents a sectional view showing the two side pieces or plates which form the

seal-strip engaging passage, detached from each other. Figs. 3 and 4 represent plan views of said plates. Fig. 5 represents the reverse face of the plate shown in Fig. 4. Fig. 6 represents a plan view of the seal-strip. Fig. 7 represents an enlarged section on line 7-7 Fig. 1. Fig. 8 represents a view similar to Fig. 1, showing the seal-strip partly inserted. Fig. 9 represents the two parts of the metal holder or outer casing, separated from each other and in perspective. Figs. 10 and 13 represent longitudinal sections of modifications of my invention, omitting the holder or outer casing. Figs. 11 and 14 represent views looking toward the inner faces of the locking plates shown in Figs. 10 and 13. Figs. 12 and 15 represent plan views of seal-strips intended for the seal locks shown in Figs. 10 and 13 respectively. Fig. 16 represents a fragmentary perspective view of a slightly different form showing a locking-plate with a seal-strip engaged.

The same numerals of reference indicate the same parts in all of the figures.

Referring first to Figs. 1 to 9 inclusive:—The seal-strip-engaging portion of my improved lock is preferably made of two plates or side pieces 12, 13, which may be rigidly connected in any suitable way and are preferably incased in a stout metal holder or outer-casing 14, more fully represented in Fig. 9. The holder or outer casing 14 consists of two members shaped to snugly contain the side pieces or plates 12, 13. These two outer-casing members may be conveniently formed by stamping them from sheet metal, the upturned edges of one member having lugs 40 adapted to pass through slots 41 in the other member and to be bent or headed down to rivet the said members together. One of the members may be formed with an integral perforated ear 42 by means of which the entire device may be secured to a freight-car or other receptacle. The space between the holder or outer-casing members is considerably less at the ends than at the intermediate portions, and the plates 12, 13, including the upturned flanges 43 and 430 of the former, snugly fit said space and therefore endwise movement of the plates 12, 13, in the holder is prevented without the employment of any other positive connection between the plates and the holder or outer-casing. Preferably the plate 12 is also pro-

vided with a lip 44 at one end. In assembling, the plates 12, 13, are first connected as is hereinafter described, and are then placed in one member of the holder with the lip 44
 5 engaging the end of the latter as illustrated. This insures accuracy of location so that no parts of the plates 12, 13, will be bent or injured when the two members of the holder are brought together and united. The seal-
 10 strip-engaging portion has a longitudinal passage extending through it from end to end, said passage being adapted to receive a seal-strip 10, which is preferably of thin resilient sheet metal. The end portions of
 15 the device are contracted to form mouths or guides 23 and 24, which closely limit lateral or sidewise movement of the seal-strip 10, as shown in Figs. 1, 8, 10 and 13, and the internal space is intermediately enlarged to
 20 permit lateral flexure of the strip between the ends of the device. The mouth or guide 23 is formed by the opposed ends of the plates or side-pieces 12 and 13, while the mouth or guide 24 may either be formed in
 25 the same way, as in Figs. 10 and 13, or as shown in Figs. 1, 3 and 8, as a flattened tube one side of which is an extension of the body of the plate or side-piece 12, the other side of
 30 the tube being formed by flaps integral with the plate or side-piece 12 and bent over said extension as seen in Fig. 3. The plate 13 is preferably secured to the plate 12 by strips
 35 25 on the plate 12 entering notches 26 in the plate 13 and bent over the outer surface of the latter. The form of the plates is such that the portion of the seal strip between the
 40 mouths or guides is normally held by its own resilience against the plate 13, as best shown in Figs. 1 and 8, where this result is accomplished by offsetting the plate 12 at 22, so that
 45 the portion of the seal strip between the mouths or guides 23 and 24 is caused to bear against the plate 13 as is hereinafter more fully described.
 50 15 represents a locking member which projects into the passage between the plates, and is preferably formed on the plate 13, said locking member being also preferably integral with the plate 13 and formed by displacing
 55 a portion of the metal of said plate to form a locking face 16 adapted to engage shoulders 17 and 29, on the seal-strip. The shoulder 17 is preferably one end of an enlargement 38 of a longitudinal slot 18 formed
 60 in the seal-strip. The shoulder 29 is one end of a slot 30 formed in the seal-strip. The locking member 15, is so arranged that either the shoulder 17 or the shoulder 29 of the seal-strip 10 may be interlocked with it by a lateral
 65 movement of the seal-strip to its normal position in the device, that is, toward the plate 13. The seal-strip is inserted by a movement in the direction indicated by the arrow in Fig. 1. In its movement through
 the passage, the seal-strip is first laterally

flexed away from the locking member 15 until the shoulder 29 passes beyond the said locking member, the seal-strip then springing automatically to its normal position, and into engagement with the locking member. 70

In accordance with my invention, I provide means for confining the seal-strip 10 in engagement with the locking member 15, and preventing its sidewise or outward flexure to an extent sufficient to disengage its
 75 shoulder 29 or its shoulder 17 from the said locking member. To this end I provide two or more confining members which may be quite variously formed as shown in the different illustrations of my invention. Said
 80 confining members may comprise two pairs of tongues 19, 19, (Figs. 4 and 5) and two ears, 35, 35, as shown in Figs. 2 and 3; which tongues and ears are adapted to bear on one side of the seal-strip 10, and prevent
 85 it from being moved sidewise or out of its proper plane away from the plate 13 sufficiently to disengage it from the locking member, the distance between the tongues
 90 19, 19, or the edges 37, 37, of the ears 35, 35, and the locking plate 13, being less than the distance of projection of the locking member 15 from its plate 13. The tongues 19, 19,
 95 are preferably supported by necks 20 or 21, said tongues and necks being integral with each other and with the plate 13, and formed by offsetting portions of the latter. The
 100 neck 20 is projected out of the plane of plate 13 beyond the plane of projection of the locking member 15; it deflects the advancing end of the seal-strip entering the mouth or
 105 guide 23, away from the plate 13, and prevents said end from impinging against the said tongues 19, 19 the end of the seal-strip being thus caused to pass by the tongues, the
 110 seal-strip 10 riding over the neck 20 until the enlarged end, 38, of its slot 18 coincides with the first pair of tongues 19, 19, whereupon the seal-strip springs inwardly against the locking member 15. The seal-strip is
 115 thus depressed sufficiently to enable the edges of its slot 18 to pass under the tongues 19, 19. The shoulder 29 of the seal-strip in Figs. 1 to 6 reaches the face of the locking member 15 after the edges of the slot 18 have passed
 120 under the tongues 19, 19, so that when the seal-strip springs to its normal position and interlocks the shoulder 29 with the locking member 15, the tongues 19, 19, overhang the strip, and prevent it from being displaced by
 125 lateral or sidewise flexure sufficiently to disengage the shoulder from the locking member. The ears, 35, 35, are preferably formed by inwardly offsetting portions of plate 12 near the outer edges of the lock-casing so as
 130 to adapt them to overhang wings 45, 45, formed on the outer edges of the seal-strip. In Figs. 1 to 8 these ears have relatively long edges 37, in a line parallel with plate 12. The ears 35, 35, are provided with in- 130

clines 36, 36, which engage the wings 45, 45, deflect them toward plate 13, and compel them ultimately to pass under the ears 35, 35, as the seal-strip advances. The body of the seal-strip is narrower than the winged portion, so that it is not engaged by the inclines 36, 36, or the ears 35, 35, but advances, riding over the neck 20, and the locking member 15 until the wings 45, 45, have been engaged by the inclines 36, 36, deflected toward plate 13, and drawn over the edges of the ears 35, 35. The shoulder 29 of the seal-strip, in Figs. 1 to 6, reaches the face of the locking member 15 after the wings 45, 45, have been engaged by the ears 35, 35, so that when the seal-strip springs to its normal position and interlocks the shoulder 29 with the locking member 15, the ears 35, 35, overhang the wings 45, 45, and prevent the seal-strip from being displaced by lateral or sidewise flexure sufficiently to disengage the shoulder from the locking member. The inclines 36, 36, of the ears 35, 35, are equally useful in compelling the strip to move in a path that will cause the inner edges of the slot 18 to pass under the tongues 19, 19, though these edges in the absence of fraudulent flexure of the seal-strip before its insertion, would normally spring into this position as the seal-strip advances, by the resilience of the seal-strip.

28, in Figs. 1 to 10, inclusive, and in Fig. 16, represents an inclined foot formed on the inner end of the plate 13, and adapted to engage shoulders 29 or 32 formed in slots 30 and 31, cut in the seal-strip. At a suitable distance beyond the foot 28 and toward the exit mouth of the seal lock, which distance is regulated by the resilience and friction of the metal seal-strip employed, there is projected into the strip-receiving passageway and between the two sides thereof, an unyielding shoulder or raised portion 22, so that the line of such shoulder of plate 12 shall extend into the said passageway slightly beyond the inner face of plate 13. The exit mouth or guide 24, which begins at this shoulder 22 is then inclined away from the plane of plate 13 and backward into the plane of plate 12. This combination of thrust, by which the seal-strip is bent over the shoulder 22, aided by the resiliency of the seal-strip, causes the latter normally to spring against the plate 13 and to engage the shoulders of its slots against both the locking member 15 and the foot 28, or any other suitable projection from the plate 13, when the advance of the seal-strip through the strip-receiving passageway has brought the seal-slots to their proper positions against the projecting members of plate 13. Furthermore, by providing the shoulder 22, formed on plate 12, so that it projects into and beyond the plane of plate 13, and by providing for the exit mouth or guide 24

from this point a passageway inclined backward into the plane of plate 12, and by providing a recess back of or outside of the plane of plate 13, between the shoulder 22 and the base of the foot 28, and between the back of plate 13, and the outer-casing, I have made it impossible ever to pass a seal-strip into and through the structure from the wrong or exit end 24; for a seal thus inserted must necessarily be carried into the recess and back of or outside of plate 13. I have also especially made it impossible to pick the lock by inserting any instrument from the exit end through the mouth or guide 24, since this inserted instrument will inevitably be carried into the recess and behind plate 13. The foot 28 is intended for the more complete protection of this recess, especially against the movements of a curved spring should the latter be inserted fraudulently from the exit end of the passageway through the mouth or guide 24 for the purpose of flexing the seal out of its position when interlocked.

One side of the mouth or guide 24, being the side which is the extension of the plate 12, is extended outwardly beyond the other side to form a toe 39 which projects from one end of the outer casing. This toe prevents the juxtaposition of the exit end or mouth 24 of the seal-lock and the slot in some portion of the ordinary hasp-lock, with which the seal-lock is intended to interlock; this toe is also especially intended for straightening (in connection with the mouth or guide 24 of which it is a species of prolongation) any curved metal spring which may be fraudulently inserted at this end for the purpose of picking the lock.

The protuberances or shoes 27, 27, are preferably offset from plate 12 at a point between the locking member 15 and the foot 28, and form integral parts thereof; they project inwardly into the strip-receiving passageway until their tips or extremities have reached slightly beyond the plane of the tip or extremity of the locking member 15, which member 15 is projecting inwardly into the said passageway from the opposite side thereof; consequently, after the seal-strip has been interlocked, it can never be flexed sidewise so as to be disengaged from the locking member 15 by pressure upon it at any point between the exit mouth or guide 24, and the protuberant shoes 27, 27, for the extremities of the shoes prevent the seal-strip from moving to a plane so as to clear the extremity of the locking member.

The seal strip, Fig. 6, is provided with a slot 31, having a shoulder 32; a slot 30, having a shoulder 29; and a longitudinal slot 18 having a head 38 with a shoulder 17. The shoulders 32, 29, and 17, are preferably at equal distances from each other, and the foot 28, the locking member 15, and the

double pair of tongues 19, 19, are so relatively arranged in connection with the slots and shoulders in the seal-strip that as the latter advances on its course, the two forward shoulders 32 and 29 simultaneously engage the foot 28 and locking member 15 respectively, the inner edges of the slot 18 being then confined by the tongues 19 and 19, and the wings 45, 45, being confined by the ears 35, 35, before the seal-strip has been completely inserted in the lock; after which, as the seal-strip is pressed farther in, the shoulder 29 moves forward and engages the foot 28, and the shoulder 17 moves forward and simultaneously engages the locking member 15, the inner edges of the slot 18 being still confined by the tongues 19, 19, and the wings 45, 45, being still confined by the prolonged edges 37, 37, of the ears 35, 35, and the seal-strip being now in its final locked condition. This arrangement for securely locking the seal-strip simultaneously at two points and in two different positions, prevents the careless or fraudulent insertion of the seal-strip by an employee nearly, but not quite, through the strip-receiving passage, failing to interlock the engaging members and leaving the seal-strip capable of withdrawal by a confederate or other dishonest person. With the double-locking members as here described, the seal-strip will already have become securely engaged with the first group of these members, or else so large a portion of its surface will have been left outside the mouth or guide 23, as to excite immediate attention from inspectors along the route.

In the lock and seal-strip shown in Figs. 10, 11 and 12, instead of the locking member 15, there are two duplicate locking members, 150 and 150, each preferably offset from plate 12, and each adapted to engage a shoulder 170, forming the end of a slot or recess 180, 180, cut in duplicate in the opposite edges of the seal-strip. In these three figures, and also in Figs. 13, 14 and 15, the locking members are placed between two sets of confining members, to wit: the tongues 19, 19, in Fig. 11, and the ears 350, 350 in Figs. 13 and 14, being thus sufficiently protected.

The locking member 151 in Figs. 13 and 14, is in two portions, the portion first reached, as the seal-strip enters the passage, being projected farther from plate 13 than the second portion. The purpose of this is to raise the first pair of wings 450, as they enter the passage, sufficiently to enable them to ride over the first pair of ears 350 without engaging them, but to let the seal-strip drop to the lower level of the forward portion of the locking member before the second pair of wings has reached the proper point for engagement with the first pair of ears; this enables the second pair of wings

to pass under the first pair of ears simultaneously with the passage of the first pair of wings under the second pair of ears.

It is to be understood that the forms of lock shown in Figs. 10 to 16, inclusive, are substantially the same, in their operation, as the form shown in Figs. 1 to 9, inclusive. In Figs. 10 to 16, the parts which are the same as, or similar to, equivalent parts shown in Figs. 1 to 9, are indicated by the same reference characters, with or without the addition of the cipher.

It is to be understood that, in use, either of the plates 12 or 13 may be regarded as the upper plate and the other one as the lower plate, since the lock may be used in any position. In Figs. 1 and 8, the plate 12 is shown as the lower one and is a substantially flat plate, and the plate 13 is shown as curved; but in Figs. 10 and 13, the plates 120 and 130, which correspond to plates 12 and 13 in Figs. 1 and 8, differ in shape somewhat in that the plate 130 is shown as the lower plate and is substantially flat, while the plate 120 is shown as irregular, or curved, and is the upper plate.

It will be seen that I have produced a seal lock having a longitudinal passage contracted at its end portions and intermediately enlarged, the said contracted and enlarged portions being relatively arranged to normally hold a seal-strip at one side of the enlarged portion of the passage, a seal-strip insertible in said passage, reciprocal locking members on the side plates and seal-strip, adapted to be interlocked by a sidewise movement of the strip to its normal position for the purpose of preventing endwise displacement of the strip, and reciprocal confining members on the plates and strip, said confining members preventing sidewise displacement of the strip when the locking members are interlocked; with a further device or combination of devices affording protection from the exit end of the strip-receiving passage; and a device for interlocking the reciprocal confining members in either one of two different positions during the insertion of the seal-strip. I do not limit myself, however, to the details of construction here shown, as these may be variously modified to secure the described result, without departing from the spirit of the invention.

Having thus explained the nature of my invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes in which it may be used, what I claim and desire to secure by Letters Patent, is:—

1. A seal lock having a longitudinal passage formed to permit sidewise flexure of a seal-strip between the ends of the passage and to normally hold the seal-strip at one side

of the passage; a locking device adapted to be engaged with the seal-strip by a sidewise movement of the seal-strip to its normal position, to prevent endwise displacement of the seal-strip; and a clutching device adapted to clutch the seal-strip from its reverse side when it is normally locked against one side of the passageway, and to prevent its sidewise displacement from the normal locked position.

2. A seal lock having a longitudinal passage contracted at its end portions to confine a seal-strip against sidewise movement, and intermediately enlarged to permit sidewise flexure of the seal-strip between the ends of the passage, the relative arrangement of the contracted and enlarged portions being such as to cause the strip to normally occupy one side of the enlarged portion; a locking device adapted to be engaged by a sidewise movement of the seal-strip in one direction, to prevent endwise displacement of the strip; and a clutching device adapted to clutch the seal-strip from its reverse side when it is normally locked against one side of the passageway, and to prevent its sidewise displacement from the normal locked position.

3. A seal lock having a longitudinal passage; a locking member adapted to engage a shoulder on a seal-strip inserted in said passage to prevent endwise displacement of the seal-strip; and a clutching device adapted to clutch the seal-strip from its reverse side when it is normally locked against one side of the passageway, and to prevent its sidewise displacement from the normal locked position.

4. A seal lock having a longitudinal passage; a locking member adapted to engage a shoulder on a seal-strip inserted in said passage, to prevent endwise displacement of the seal-strip; and a clutching device adapted to pass through a slot in the seal-strip and engage the other side of said strip.

5. A seal lock having a longitudinal passage and provided with means for engaging a seal-strip, and having means for preventing flexing of said strip out of its plane of lock engagement, the latter comprising a clutching device adapted to pass through a slot in the seal-strip and engage the other side of said strip.

6. A device of the character described comprising a casing having a longitudinal passage, and a seal-strip of varying length, said casing including means for preventing shifting of the strip edgewise or into a different plane after the complete insertion of the strip in the casing, said means including a clutching device adapted to pass through a slot in the seal-strip and engage the other side of said strip.

7. A seal lock having a longitudinal passage; a locking member adapted to engage

a shoulder on a seal-strip; and inclined portions adapted to engage the seal-strip to deflect it laterally to engage it with said locking member, and a clutching device adapted to pass through a slot in the seal-strip and engage the other side of said strip.

8. A seal lock comprising two members or plates connected together and having a longitudinal passage between them; one of said plates having a locking member; one of said plates having confining members; and one plate being provided with deflectors adapted, at a desired point, to direct the seal-strip in an undulatory course which will engage it with said locking and confining members, and a clutching device adapted to pass through a slot in the seal-strip and engage the other side of said strip.

9. A seal lock having a longitudinal passage provided with locking and confining members adapted to engage a seal-strip inserted in said passage, said passage being so deflected from the horizontal at or near each end as to normally cause the seal-strip to spring to and to remain at one side of the passage, and a clutching device adapted to pass through a slot in the seal-strip and engage the other side of said strip.

10. A seal lock having a longitudinal passage and provided with means for engaging a seal-strip to lock it therein, and a recess at one side of said passage; the emerging or exit portion of said passage being so inclined with reference to the remainder of said passage and with reference to said recess, as to cause anything inserted at the emerging or exit end of said passage to be deflected out of said passage and into said recess beside the same, and a clutching device adapted to pass through a slot in the seal-strip and engage the other side of said strip.

11. A seal lock comprising two plates having a longitudinal passage between them and having a locking member adapted to engage a shoulder on a seal-strip; one of said plates having an angular lip; and a holder or outer casing for said plates; the two plates when assembled being adapted to snugly fit the interior of the assembled members of the holder with said lip in engagement with one end of the holder, and a clutching device adapted to pass through a slot in the seal-strip and engage the other side of said strip.

12. A seal lock having a longitudinal passage fitted with locking and confining members and provided with means for locking and confining a seal-strip simultaneously at two points and in either of two positions, so that it cannot be flexed out of its plane of locking engagement when locked in either position, said means including a clutching device adapted to pass through a slot in the seal-strip and engage the other side of said strip.

13. A seal lock having a longitudinal pas-
sage and provided with a locking member
adapted to engage a shoulder on a seal-strip
inserted in said passage, a portion of the
5 lock at one end being extended to form a
toe to prevent the juxtaposition of the emerg-
ing end of the seal lock with a slot or pas-
sage in the hasp lock intended for interlock-
ing the seal lock with the hasp lock, and to
10 straighten out a curved strip introduced at
the emerging end of the seal lock for the
purpose of picking the lock.

14. In a seal lock, having a passageway
for a seal-strip, said passageway being pro-
15 vided with locking and confining members
adapted to engage a seal-strip inserted there-
in, a flexible seal-strip having a longitudinal
slot and provided with wings or shoulders
projecting outwardly from the body of the
20 strip, adapted to pass within the passageway
and be engaged by the confining members in
said passageway to prevent lateral or side-
wise flexure of said seal-strip sufficiently to
free it from the locking members of said seal
25 lock, the lock having a clutching device
adapted to pass through said slot in the
strip and engage the other side of the strip.

15. In a seal lock having a passageway
for a seal-strip, said passageway being pro-

vided with locking and confining members 30
adapted to engage a seal-strip inserted there-
in, a flexible seal-strip having a longitudinal
slot and provided with opposite shoulders
or edges projecting within the slot adapted
35 to be engaged by the confining members in
said passageway, to prevent lateral or side-
wise flexure of said seal-strip sufficiently to
free it from the locking members of such
seal lock, the lock having a clutching device
40 adapted to pass through said slot in the strip
and engage the other side of the strip.

16. The combination with a seal lock hav-
ing a longitudinal passage, of a seal strip
having a slot, said lock having a clutching
member projecting through the slot in the 45
seal-strip and engaging the other side of the
strip and having means for preventing the
approach from either direction to the lock-
ing member, of a fraudulent steel ribbon in-
50 troduced for the purpose of flexing the seal-
strip off the locking member and withdraw-
ing it.

In testimony whereof I have affixed my
signature, in presence of two witnesses.

WARREN K. BLODGETT.

Witnesses:

J. P. IDE,

E. BATCHELDER.