Nov. 10, 1931. H. E. LAKE 1,830,950

SAFETY SEAL

Filed Aug. 2, 1929

Fig. 1.

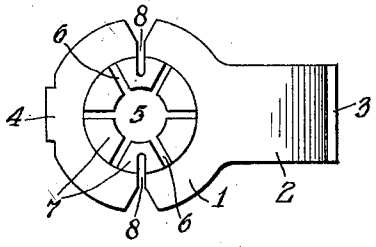


Fig. 2.

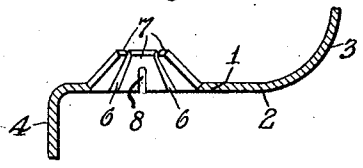


Fig. 3.

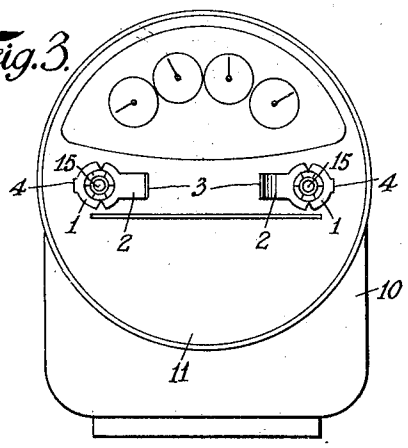


Fig. 4.

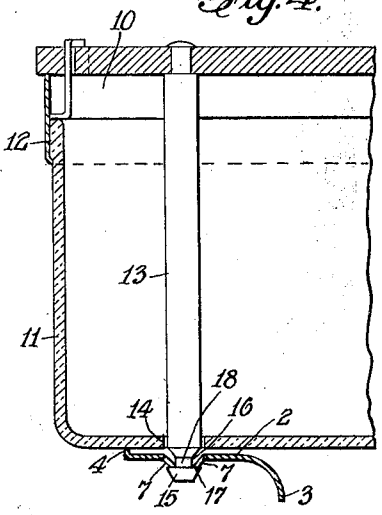


Fig. 7.

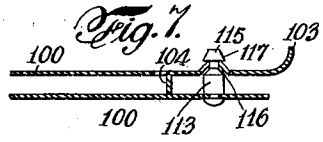


Fig. 6

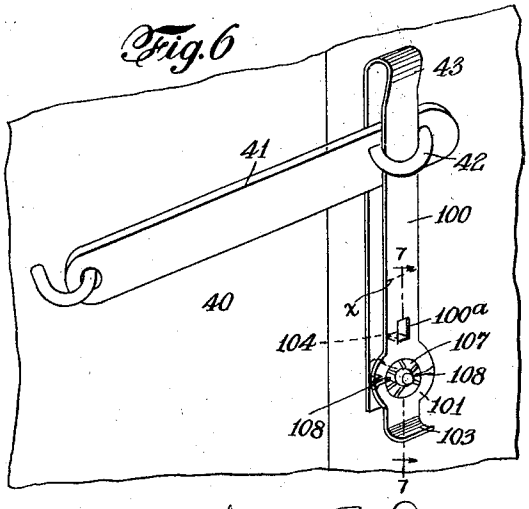


Fig. 5.

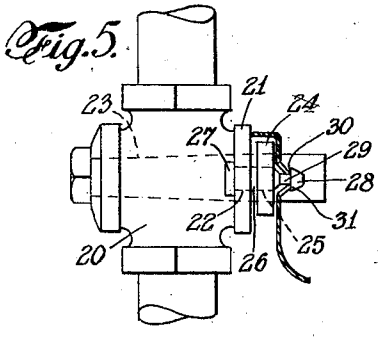


Fig. 8.



Harry E. Lake INVENTOR

BY Louis Prevost Whitaker

ATTORNEY

Patented Nov. 10, 1931

1,830,950

UNITED STATES PATENT OFFICE

HARRY E. LAKE, OF NEW YORK, N. Y., ASSIGNOR TO PREFERRED UTILITIES MANUFACTURING CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE

SAFETY SEAL

Application filed August 2, 1929. Serial No. 383,010.

My invention consists in the novel features hereinafter described, reference being had to the accompanying drawings, which illustrates several embodiments of the same, selected by me for purposes of illustration, and the said invention is fully disclosed in the following description and claims.

The object of my invention is to provide a frangible seal which may be employed in connection with any device having relatively movable parts, for the purpose of preventing a change in the relation of the parts to be protected, without leaving possible evidence of tampering therewith. It is particularly desirable for use in connection with locking means for container openings such as are described in my application for Letters Patent of the United States dated June 14th, 1929, and given Serial No. 370,762, for example, although this seal is capable of very wide application, not only to locking means, but wherever it is desired to retain relatively movable parts against unauthorized tampering therewith. A valuable feature of my improved seal is that it can be placed in operative position entirely by the fingers without the aid of any tool after which it cannot be removed without breaking it, and the breaking is also accomplished by the fingers without the aid of any tool, so that it can be most conveniently applied and removed.

Referring to the accompanying drawings, which illustrates several embodiments of my invention,

Fig. 1 is a top plan view of my improved seal, detached.

Fig. 2 is a longitudinal sectional view of the same.

Fig. 3 is a front view of an electric meter having two of the seals applied thereto.

Fig. 4 is an enlarged sectional view of a portion of the meter casing showing one of the seals in section.

Fig. 5 is an elevation of a turn-cock provided with locking means such as is used in connection with gas meters, and having my seal applied thereto.

Fig. 6 is a perspective view showing my seal in a form applicable to the sealing of car door locks or other hasp locks and the like.

Fig. 7 is an enlarged sectional view on the line 7—7 of Fig. 6.

Fig. 8 is a sectional view similar to Fig. 7 showing a slight modification.

Figs. 1 and 2 represent a simple embodiment of my improved seal, which comprises a thin metal plate, indicated at 1, the main body of which is conveniently formed substantially circular, although this is not essential, and is provided at one side with a lever arm or finger portion, indicated at 2, having an upturned end, indicated at 3, the main body of the seal being preferably provided on the opposite side of its center from the lever arm, 2, with a downwardly extending portion, 4, which I term the abutment. The central portion of the main body, 1, of the plate, is provided with an aperture, 5, from which extend radial slits, 6, forming lips, 7, which are bent upwardly, as clearly shown in Fig. 2, into inclined positions with respect to the plane of the main body, 1. The main body, 1, of the plate is also provided on opposite sides with weakening slots, or recesses, 8, disposed in a line extending through the center of the aperture, 5, and the lips, 7, are so arranged that each weakening slot, 8, extends over a considerable portion and is disposed centrally of one of said lips. The plate is made of a material which can be tempered so as to be extremely brittle, and preferably of steel. The main body, 1, of the plate, and the lips, 7, thereof are hardened or tempered so as to be extremely brittle. The plate is made very thin and as the weakening slots, 8, extend well into oppositely disposed lips, 7, the main body can be easily broken through the remaining portions of the said oppositely disposed lips, 7. It will also be evident that the inclined lips, 7, can be readily broken at their angular junction with the other portions of the main body. While it is only necessary in carrying out my invention that the main body, 1, of the plate surrounding the aperture, 5, and including the lips, 7, shall be tempered to the brittle point, I prefer in practice to temper the entire plate, although that is not essential.

I also prefer to coat the entire seal, or at least the main body and lips, 7, thereof, with a coating which is of such character as to be injured or destroyed by the application of heat. To this end the seal may be plated with a thin coating of nickel, chromium or other suitable metal, or it might be protected by the application of any other suitable protective coating which will be injuriously affected in case heat were applied to the seal for the purpose of extracting the temper.

My improved seal is employed in connection with a suitable stud having an undercut recess forming a shoulder below the head of the stud, and the head of the stud is conveniently provided with tapering or conical portions above the shoulder, the greatest diameter of the head being slightly greater than the distance between the upper ends of oppositely disposed lips, 7, so that when the aperture, 5, of the seal is placed over this stud and pressed upon it, the lips, 7, will yield very slightly without breaking them and will pass over the head of the stud, their upper ends snapping into the recess below the same and engaging the shoulder from which they cannot be disengaged without breaking the seal or breaking one or more of the lips.

In Figs. 3 and 4, for example, I have shown my improved seal in connection with the removable cover of an electric meter as an illustration of its practical application. In these figures, 10, represents the body of the meter, and 11, the removable cover of glass or other suitable material, which is held in place by yielding clips, one of which is indicated at 12, in Fig. 4. The body of the meter is shown in this instance provided with a locking stem, 13, which extends through an aperture, 14, in the cover, 11. There may be one or more of these stems, as desired. In this instance I have shown the meter provided with two. Each of the locking stems is provided at its outer end with the tapering or conical head, 15, having the under-cut recess, indicated at 16, forming the annular shoulder, 17, to engage the lips, 7, of the seal. When the cover is in place, the seal can be instantly applied by simply forcing the lips, 7, over the conical head, 15, of the locking stem, permitting the lips, 7, to engage the inner face of the shoulder, 17, thereof. The upturned end, 3, of the seal will project outwardly, as shown in Fig. 5, and forms a finger piece in handling the seal, and the abutment portion, 4, is of such length as to engage the adjacent face of the cover, 11, when the plate portion of the seal is substantially parallel to said face. It will be understood that the seal can be readily pressed into sealing position by the fingers, and that the very slight movements of the lips, 7, to separate them sufficiently to snap over the conical head of the locking stem, can be accomplished without fracturing said lips at their junction with the plate portion of the seal. When, however, the seal has been placed in position, the inner ends of the lips, 7, will engage the reduced portion, 18, of the same below the conical head, and any attempt to disengage the seal or any of the lips from the locking head will result in a fracture of the metal so that it is impossible for any unauthorized person to remove the part protected by this seal without breaking it so as to leave visual evidence that it has been tampered with.

When an authorized person desires to remove the protected part, as the cover 11 in Figs. 3 and 4, the seal or seals is or are removed by simply grasping the finger piece, 3, and pulling it outwardly, which fractures the seal through the remaining portions of the lips. In thus fracturing the seal, the lever arm and finger piece, 2, 3, act as a lever, and the abutment, 4, acts as a support for the portion of the plate on the opposite side of the weakening slots, from the finger piece. The removable part, as the cover, 11, can now be removed and replaced, and after it is replaced, new seals will be applied to the locking head in the manner previously described.

In Fig. 5 I have illustrated the application of the seal to means for locking the rotary plug of a shut-off cock, such as is ordinarily used on gas meters, for example. In this figure, 20, represents the body of the cock, which is provided with a locking flange, 21, having an aperture, 22, therein. 23 represents the rotary valve member provided with an arm, 24, having a slot, 25, therein, which registers with the slot, 22, in the locking flange, 21, when the cock is in the desired position in which it is to be sealed. In this instance I have shown a locking bolt or pin, 26, having an enlarged portion, 27, at one end and provided at the other end with a conical or tapered head, 28, having a reduced portion, 29, formed by the under-cut recess, 30, and producing the locking shoulder, 31, to engage the seal. The seal is applied in a manner previously described after the locking bolt is inserted through the registering apertures, 22 and 25, and the abutment, 4, of the seal is shown in this instance as engaging the flange, 21, of the valve casing, to assist in breaking the seal through the line of the weakening slot, as before described.

While I have shown and described this abutment, 4, I do not limit myself to this construction as the abutment, 4, could be dispensed with if necessary, and likewise, the projection, 2, and upturned finger piece, 3, could also be dispensed with if found desirable. The abutment, 4, and finger piece, 3, however, are valuable features of the invention, greatly facilitating the operation of applying and removing the seal.

In Figs. 6 and 7 I have illustrated a modified form of the seal which may be conveniently used in connection with freight car door locks or in other connections where a seal of the ribbon or band type is desirable. In Fig. 6, for example, I have shown portion of a car door, indicated at 40, having hasp, 41, to engage a staple, 42, in the door jamb, indicated at 43. In this instance the plate forming the seal is in the form of a band or strip, 100, which may be made of steel or other metal, capable of receiving a high temper to render it brittle. One end of the strip or plate is provided with the part, 101, which forms the body portion of the seal, having the lips, 107 separated by the slots, 106, and being provided with the oppositely disposed weakening slots, 108, exactly as hereinbefore described. The outer end of the strip, adjacent to the seal portion is also preferably provided with the upturned finger piece, 103, and where the abutment is desired, it may be conveniently formed, as an integral struck up projection, as indicated at 104, by punching the portion constituting the abutment out of the strip, 100, forming the slot 100^a, and bending it downwardly substantially perpendicularly to the plane of the strip. The opposite end of the strip is provided with a stud, 113, as best shown in Fig. 7, riveted or otherwise secured to the opposite end of the strip from the seal portion, and provided with the tapered head, 115, under-cut recess, 116, and locking shoulder, 117.

In using this form of the seal it can be passed through the hasp, 42, for example, or other locking means which it is desired to secure, and bent to bring the stud, 113, into operative engagement with the seal. In this form of the invention, obviously only the portion of the strip which constitutes the seal proper is tempered to the point of brittleness, as indicated, for example, by the dotted line, x, and the remaining portion of the strip, or at least the central portion, where the bend is made, would be left in such condition that it could be readily bent or folded, as shown.

While I have illustrated several ways in which my improved seal can be conveniently used, it is obvious that it may be employed in many other ways, and wherever its use may be convenient or advantageous. For example, instead of forming the seal as an integral part of a strip, as in Figs. 6 and 7, it will be obvious that, as shown in Fig. 8, I may provide a locking strip, indicated at 200, with the locking stud, 213, constructed as previously described, the other end of the strip being merely provided with an aperture, 200^b, for engaging the stud, the stud being made long enough to receive a separate seal, shown in Figs. 1 and 2, if this should be found desirable.

It will be understood that in the practical use of the seals herein described, they will be provided with the name or trade-mark of the party using the same, or with other distinguishing mark or marks, and preferably with a serial number which will be different on each seal, thus enabling the distributor to keep track of the seals and the more readily to locate any tampering with any of the seals applied in actual use. The identifying marks and numbers may be conveniently indented or impressed in the metal of the seal, preferably before it is tempered to the desired brittle condition hereinbefore referred to, or the identification of the seals may be effected in any other desired manner.

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

1. The herein described frangible seal, comprising a frangible member provided with an aperture and a plurality of inclined lips surrounding said aperture, said member being provided with weakening slots on opposite sides of said aperture, each of which extends into one of said inclined lips.

2. The herein described frangible seal, comprising a frangible member provided with an aperture and a plurality of inclined lips surrounding said aperture, said member being provided at one side of the aperture with an abutment extending laterally from the plane of the member to engage a support for facilitating the breaking of the seal.

3. The herein described frangible seal, comprising a frangible member provided with an aperture and a plurality of inclined lips surrounding said aperture, said member being provided with weakening slots on opposite sides of said aperture, each of which extends into one of said inclined lips, said member being provided at one side of a line passing through said weakening slots, with an abutment offset from the plane of the member to facilitate fracturing the member on said line.

4. The herein described frangible seal, comprising a frangible member provided with an aperture and a plurality of inclined lips surrounding said aperture, said member being provided at one side of the aperture with an abutment offset from the plane of the member for facilitating the breaking of the seal, said member being provided on the opposite side of said aperture with a projecting hand engaging portion to serve as a lever in breaking the seal.

5. The herein described frangible seal, comprising a frangible member provided with an aperture and a plurality of inclined lips surrounding said aperture, said member being provided with weakening slots on opposite sides of said aperture, each of which extends into one of said inclined lips, said member being provided at one side of a line passing through said weakening slots, with

an abutment offset from the plane of the member to facilitate fracturing the member on said line, said member being provided on the side of said line opposite said abutment with a projecting hand engaging portion to serve as a lever in breaking the seal.

6. The hereindescribed frangible seal, comprising a frangible member provided with an aperture and a plurality of inclined lips surrounding said aperture, said member being provided with weakening slots on opposite sides of said aperture, each of which extends into one of said inclined lips, said member being provided on one side of the aperture with an upturned hand engaging portion and on the other side of said aperture with a downwardly extending angular projection both bent up from the member.

7. The herein described frangible seal comprising an elongated metal member, one end of which is provided with a locking stud, having a tapering head and an under-cut recess forming the locking shoulder, the other end of said member being provided with a brittle, frangible portion, having an aperture to engage said stud, a plurality of inclined lips surrounding said aperture, and weakening slots on opposite sides of the member in line with the axis of said aperture, each of which slots extends into one of said inclined lips, said member being provided at one side of a line passing through said weakening slots with an integral angularly disposed struck-up abutment offset from the plane of said member, and being provided on the opposite side of said line with a projecting hand engaging portion to serve as a lever in fracturing said seal.

In testimony whereof I affix my signature.

HARRY E. LAKE.