J. L. DINSMOOR.

SEAL.

APPLICATION FILED OCT. 15, 1908.

998,878. Patented July 25, 1911.

Fig. 2.

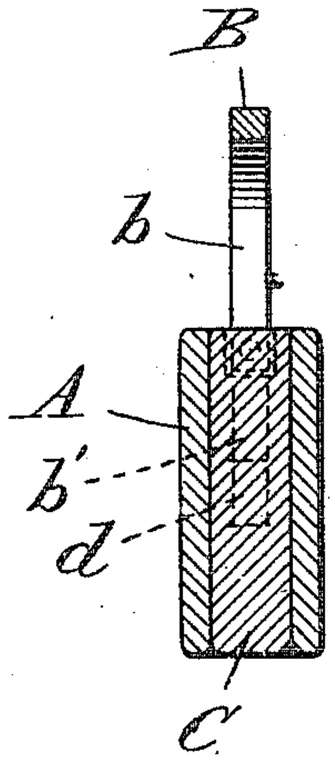


Fig. 1.

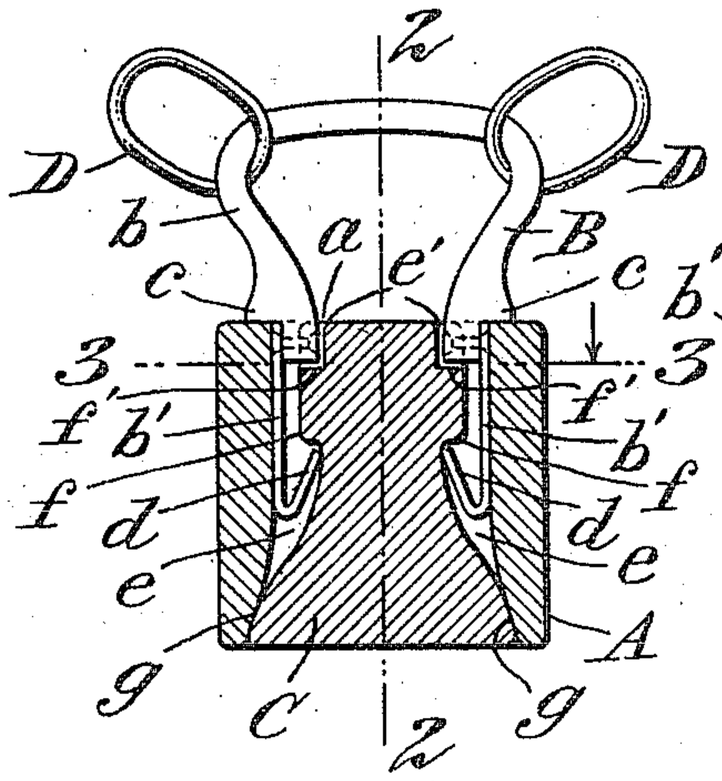


Fig. 3.

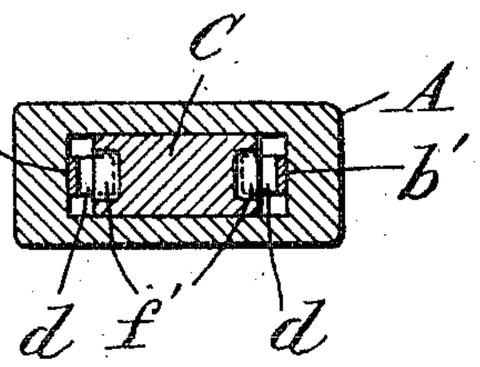


Fig. 5.

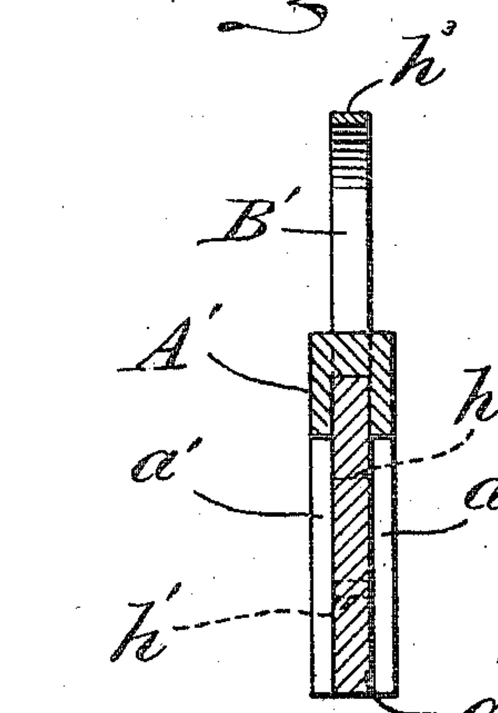


Fig. 4.

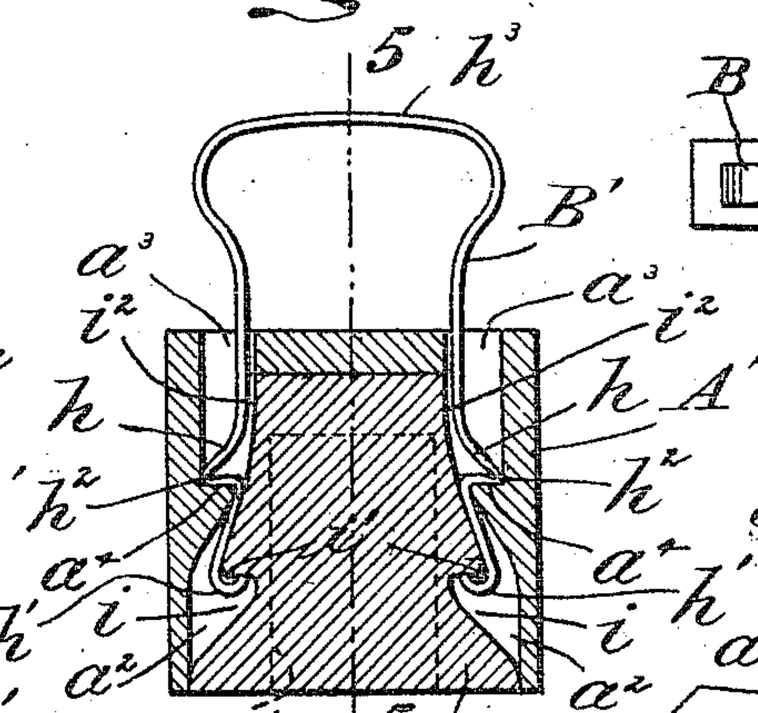


Fig. 6.

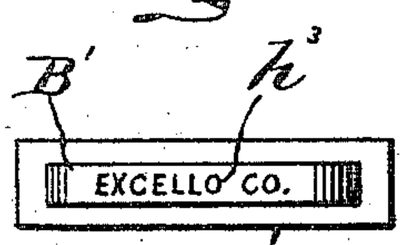


Fig. 7.

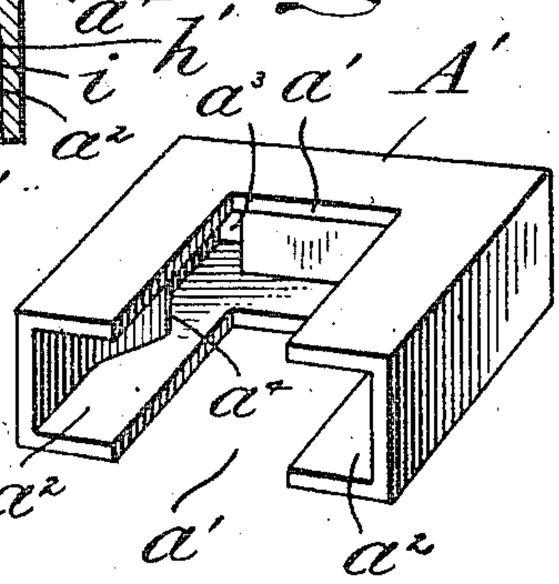


Fig. 8.

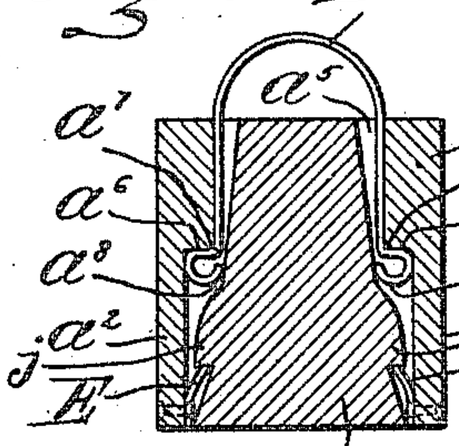


Fig. 9.

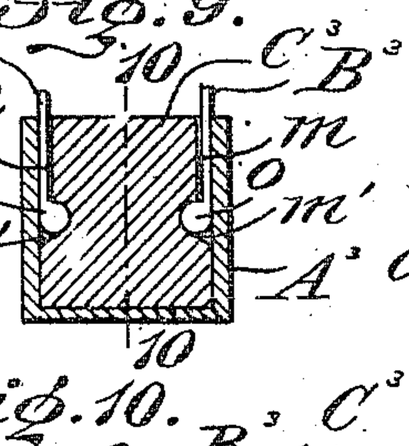
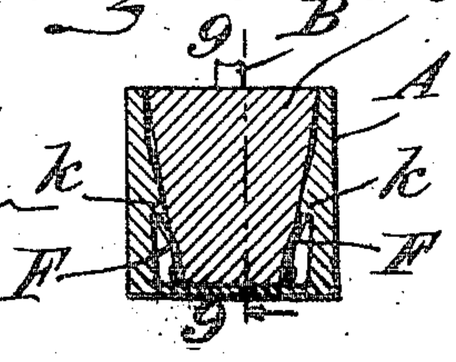


Fig. 10.



WITNESSES

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SEAL.

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Application filed October 15, 1908. Serial No. 457,806.

To all whom it may concern:

Be it known that I, JOHN L. DINSMOOR, a citizen of the United States, residing in the city of New York, borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Seals, of which the following is a specification.

This invention is a seal wherein the shackle can be released only by breaking or fracturing a frangible member which forms an essential part of the seal structure.

Seals are now used commercially for precluding unwarranted inspection of, or interference with, a large variety of apparatus or structures, such as electric meters, arc lamps, and other forms of electrical devices, as well as for car doors, baggage, and packages in transit through the customs, and for numerous other purposes. As a result of the extended commercial use of seals, large quantities are employed; but in most cases the seals are of such character that when once applied, they must be broken in order to unseal the apparatus or structure, the broken seal being thrown away. This results in financial loss, and the cost of maintenance is no inconsiderable item, particularly where an establishment uses the seal in large quantities.

It is the purpose of the present invention to improve seals of that class wherein the shackle is locked in a casing, and this object is attained by the employment of an insertible locking member composed, preferably, of frangible material. The shackle and the casing are thus rendered capable of use repeatedly, so that the initial cost of equipment remains a permanent asset, to a large extent. By replacing a broken locking member with a fresh one, and using said member in connection with the casing and the shackle, the seal can be used any number of times. In view of the fact that the replaceable part is of simple and compact construction, and is manufactured economically, the seal when broken open can be cheaply placed in serviceable condition again, and the cost of maintenance is thus minimized.

The seal of this invention is characterized by the employment of a casing, a shackle adapted for interlocking engagement with the casing, and a member adapted to effect the interlocking engagement of the shackle with the casing, said member when inserted into the casing being restrained from movement therein. In a preferred form, said insertible member is composed of frangible material, such as glass, or porcelain, and it is constructed for interlocking engagement with the shackle. The frangible insertible member constitutes the renewable part of the seal. The seal is capable of manufacture economically, and it is efficient and reliable in use.

Other features of the invention, and the advantages thereof, will appear from the annexed detailed description.

In the accompanying drawings I have illustrated different practical embodiments of the invention, but the constructions shown therein are to be understood as illustrative, only, and not as defining the limits of the invention.

Figure 1 is a vertical section illustrating one form of seal embodying the invention. Fig. 2 is a cross section on the line 2—2 of Fig. 1. Fig. 3 is a horizontal section on the line 3—3 of Fig. 1. Fig. 4 is a vertical section illustrating a preferred form of the seal. Fig. 5 is a cross section on the line 5—5 of Fig. 4. Fig. 6 is a plan view of the seal shown in Figs. 4 and 5. Fig. 7 is a detail perspective view illustrating one form of casing adapted for the seals of Figs. 1 and 4. Fig. 8 is a vertical section illustrating another embodiment of the invention, and Figs. 9 and 10 are vertical sections at right angles to each other through still another form of seal constructed in accordance with the invention.

The seal shown in Figs. 1, 2 and 3 of the drawings is adapted, mainly, for use on apparatus of large size or for heavy work, such as for sealing car doors, but it is evident that the principle of the invention may be used in the construction of seals generally, such as seals for electrical apparatus of various kinds.

A casing, A, of the form shown more particularly in Fig. 7, is adapted for the reception of a shackle, B, and a member, C, the latter being made separate from the casing and the shackle and adapted for interlocking engagement with one or both parts so as to complete the seal and prevent removal of shackle, B, from casing, A. Said casing is shown as having a slot or opening, a, in its upper part, and an opening, a', in its re-

spective sides, the casing being provided, furthermore, with grooves, a^2. The casing may be composed of any suitable material, such as metal or porcelain, but it is preferred to make the casing of metal by either stamping, pressing or casting the same.

One form of shackle, B, is shown in Fig. 1 as consisting of a cast metal portion, b, and yieldable members, b', which are made separate from the cast metal part, b, and are suitably attached thereto, as for example, by riveting yieldable parts, b' to the end portions of cast metal part, b. Said cast metal part, b, is a bow and it is shown as having shoulders, c, which are adapted to rest upon and engage with a solid upper part of casing, A, when the yieldable parts or arms, b', of the shackle are thrust into said casing, A, whereby said shoulders, c, limit the endwise movement of the shackle in one direction relative to casing, A. The shackle is adapted to engage with suitable links, D, which are associated with the apparatus to be sealed, it being evident that said links may be slipped over the shackle when the latter is disconnected from casing, A. The arms or yieldable parts, b', of the shackle are turned upwardly and inwardly so as to produce hooks, d, said hooks being in facing relation and disposed within the grooved parts, a^2, of casing, A, when the shackle is fitted to said casing.

It is preferred to make member, C, of a suitable frangible material, such as glass, porcelain, or the like, but it is not desired in all instances to restrict the invention to this particular material. Member, C, is cut away at its side portions at e, e', so as to produce shoulders, f, f', two of said shoulders being provided on one side of the frangible member and two on the other side of the frangible member, as shown clearly in Fig. 1. Said member, C, is insertible into grooved part, a^2, of casing, A, and it extends crosswise of the slot, a', therein, whereby member, C, is adapted to close the open space of casing, A. The upper part or head of member, C, enters and fills slot, a, in the upper part of casing, A, whereby recesses, e', of member, C, are adapted to receive the lower ends of cast metal part or bow, b, of shackle, B. Shoulders, f', are thus adapted to engage with bow, b, and for the purpose of limiting the upward movement of member, C, when introducing it into casing, A, but this result is secured, also, by beveling the lower grooved parts of casing, A, as at g, so as to engage with the wide lower part of member, C. When introducing member, C, the shouldered upper part or head thereof engages with hooks, d, which are pressed backwardly until the shouldered parts, f, pass said hooks, whereupon the hooks, d, spring inwardly toward each other and fit below shoulders, f, as shown in Fig. 1, whereby member, C, is locked within casing, A, by hooked members, b', of the shackle, and at the same time, the shackle is locked in casing, A, by hooks, d, engaging shoulders, f.

It is manifest from this description that member, C, cannot be withdrawn because of its engagement with casing, A, and its locked engagement with shackle, B, whereas shackle, B, cannot be withdrawn from the casing for the reason that the hooks, d, engage the shoulders, f, and shoulders, c, engage casing, A. In order to unseal an apparatus, it is necessary to break, rupture or destroy member, C, and this can be quickly accomplished by striking member, C, a sharp blow, whereupon the fragments of the broken member will drop out of the casing and the shackle can be withdrawn. The shackle and casing may be used repeatedly by inserting new members, C, therein, as heretofore described, and as the part, C, can be manufactured economically and carried conveniently by the operators, it is evident that the cost of maintaining a seal equipment is kept at a minimum figure.

The construction shown in Figs. 4, 5 and 6 of the drawings is a seal adapted for lighter work than the form shown in Figs. 1 to 3 inclusive, the metal parts being composed, mainly, of punchings, stampings or pressings. Casing, A', is similar in many respects to the casing of Fig. 1, but instead of slot, a, in the head of casing, it is provided with openings, a^3, said casing having the open center, a', and the grooved sides, a^2. Within each grooved side of the casing is formed a shoulder, a^4. Shackle, B', is, preferably, a metal strip, ribbon or wire, the legs of which are bent to form shoulders, h, and the extremities are inturned to produce other shoulders or hooks, h'. Preferably, one or both legs of the shackle may be weakened at h^2, and said shackle is provided with an ineffaceable identification character or inscription, as at h^3 shown in Fig. 6, which is stamped or pressed into the metal composing shackle, B'. Obviously, the leg of the shackle may be weakened at h^2 in various ways. In one construction, the metal composing the shackle is bent so sharply or abruptly at the point h^2, as to partially rupture the fibers or grain of the metal, thus rendering the metal so weak at the bend as to easily break when a strong pull is exerted thereon. Again, the thickness of the metal may be artificially reduced, as by filing it partly away at the point it is desired to weaken it. Various other mechanical expedients may be resorted to for the purpose of insuring fracture or breakage of the shackle at the particular point desired when a strong pull is exerted on the shackle in an effort to disconnect it from the seal body. Member, C', is

composed of frangible material, such as glass or porcelain, and it is provided with beveled edges, i, i^2, so disposed with relation to each other as to produce an intermediate shoulder, i'.

In using the seal of Figs. 4, 5 and 6, shackle, B′, is disconnected from casing, A′, and one or both legs of said shackle are engaged with suitable links or other parts of an apparatus to be sealed. The legs of shackle, B′, are thrust into the openings, a^3, of casing, A′, so as to enter grooved side members, a^2, of said casing in position for the shoulders, h, of the shackle to engage with shoulders, a^4, of casing. The shackle having been inserted, member, C′, is now thrust into the lower open end of casing, A′, so as to be received in grooves, a^2, thereof. The inclined edges, i^2, of member, C′, ride against hooks or shoulders, h', of the shackle so as to press the latter into the grooved sides, a^2, of the casing, and when member, C′, is fully inserted into the casing, the edges, i^2, engage with the lower portions of the shackle. The shackle legs are pressed outwardly for the shoulders, h, to engage firmly with shoulders, a^4, of casing, A, and the hooks or shoulders, h', of said shackle are fitted or engaged beneath shoulders, i', of member, C′. The shackle of Fig. 4 cannot be pulled upwardly for the reason that the shoulders, h', thereof are interlocked with shoulders, i', of member, C′, nor can the shackle be pulled downwardly, because such downward movement is precluded by shoulders, h, of the shackle engaging with shoulders, a^4, of the casing. Member, C′, cannot be displaced from the casing for the reason that it is retained against lateral movement by fitting in the grooved sides, a^2, nor can it be moved upwardly because its head engages with the solid closed upper part of the casing, nor can it be pulled downwardly for the reason that its shoulders, i', are locked with hooks or shoulders, h', of the shackle. The seal can be disconnected only by breaking or destroying member, C′, and when the seal is to be again used, a new member, such as C′, must be inserted. Additional security is imparted to the seal by reason of the weakened point, h^2, being formed in the shackle and by the employment of the identification character, h^3. Should the seal be tampered with and an extra strong pull be exerted on shackle, B′, it will break or give at this weakened point, h^2, and the identification on the shackle will preclude a spurious shackle from being inserted into the seal.

The construction of Fig. 8 is quite similar to the devices heretofore described, although the shackle and frangible member are modified somewhat in construction so as to bring into use small springs. Casing, A^2, is provided with a slot, a^5, in its upper part, and in the grooved sides, a^2, of the casing are the shoulders, a^6. Shackle, B^2, is composed of a length of punched metal or a ribbon or wire, and the lower ends of said shackle are bent inwardly to form the shoulders, a^7, and the hooks, a^8. Springs, E, are fastened to the grooved sides, a^2, or they may be struck up in one piece with the casing when made of sheet metal. Member, C^2, is composed of frangible material, and it is provided with lugs, j. The shackle is insertible through slot, a^5, and when member, C^2, is thrust into place, the legs of the shackle are expanded for the shoulders, a^7, to fit beneath shoulders, a^6, of casing. The hooks, a^8, engage with the edges of member, C^2, so as to press the shackle into the grooved sides of the casing. The springs or locking members, E, engage beneath the lugs, j, so as to preclude withdrawal of member, C^2, from the casing. The shackle cannot be drawn upwardly for the reason that its shoulders, a^7, engage with shoulders, a^6, of said casing, and the inner ends of the shackle are housed or contained within the casing so that the member, C^2, will preclude access to the interlocked parts between the shackle and casing.

The structure shown in Figs. 9 and 10 embodies the leading features of the invention as heretofore disclosed. Casing, A^3, is a shell open at its upper end and closed at its lower end, said shell being provided with shoulders, k, near the lower part thereof. Member, C^3, is composed of frangible material molded to the required shape and dimensions to fit the shell snugly. Said member, C^3, is provided in its respective sides with a longitudinal groove, m, which is enlarged at m'. Shackle, B^3, is enlarged at the lower ends of its legs, as at O. The enlargements may be cast on the shackle, or the ends of the shackle may be doubled or folded so as to produce the enlargements, O. Springs, F, are provided at the lower part of member, C^3. In assembling the parts of the seal shown in Figs. 9 and 10, member, C^3, is disconnected from casing, A^3, and the shackle is fitted in grooves, m, of said member, C^3, the enlarged ends, O, of said shackle being received in recesses, m', of said member, C^3. The casing, A^3, is now slipped over frangible member, C^3, and the end portions of springs, F, are engaged with shoulders, k, thus locking member, C^3 within casing, A^3, and retaining shackle, B^3, in locked engagement with grooved member, C^3.

Having thus fully described the invention, what I claim as new, and desire to secure by Letters Patent is:

1. In a seal, a body portion, a shackle having direct interlocking engagement with said body portion, and a separate member coöperating with the shackle to secure said

interlocking engagement of the shackle with the body portion, said separate member being composed of frangible material.

2. In a seal, a body portion, a shackle having interlocking relation to said body portion, a separate member composed of frangible material and insertible in said body portion, said separate member acting on the shackle to force it into locked engagement with the body portion, and means to preclude movement of the separate member with respect to the body portion.

3. In a seal, a body portion, a shackle insertible in the body portion for interlocking engagement therewith, and a member separate from the shackle and the body portion, said member being insertible in said body portion, and coöperating with the legs of said shackle to spread the same sidewise with relation to each other, thereby securing the interlocking connection between the shackle and the body portion, said body portion being provided in its walls with a slot or opening adapted to expose the insertible member.

4. In a seal, a body portion, a shackle having means for locking engagement with said body portion internally thereof, and a member adapted by its insertion to spread the legs of the shackle and thereby secure said locking engagement between the body portion and the shackle.

5. In a seal, a casing provided with shackle-engaging means on the interior thereof, a shackle having yieldable legs incased within said casing, and a separate member having interlocking engagement with the shackle and adapted to spread the legs of said shackle for the purpose of securing interlocking engagement between the shackle and the shackle-engaging means of said casing.

6. In a seal, a chambered member provided at its respective ends with openings adapted to receive a shackle and a locking member, shackle-locking means within said casing, a shackle the legs of which are insertible into one end of the casing, said legs of the shackle having locking means, and a locking member insertible into the other end of the casing, said locking member coöperating with the shackle legs for moving the locking means thereof into engagement with the shackle-locking means of the casing.

7. In a seal, a body portion having grooved sides and openings in the respective ends thereof, a shackle adapted to enter the openings at one end of said body portion, and a locking member insertible through the opening at the opposite end of the body portion, said second member cooperating with the shackle to retain it from displacement relative to the body portion.

8. In a seal, a chambered member, a shackle insertible partially therein, and a locking member having surfaces adapted to engage with the shackle for the purpose of expanding said shackle into interlocking engagement with the chambered member, said locking member being provided, also, with means adapted to interlock the member and the shackle together.

9. In a seal, a chambered member, a shackle insertible partially therein, said shackle and the chambered member being provided with means adapted to interlock said parts, a lpcking member having surfaces adapted to expand the shackle and thus retain the same in locked engagement with said chambered member, and means for precluding movement of the locking member relative to said chambered member.

10. In a seal, a casing provided with shoulders, a shackle having yieldable parts adapted for engagement with said shoulders, an insertible member engaging the yieldable parts of the shackle, and means for retaining the insertible member within said casing.

11. In a seal, a casing having grooved sides, a shackle having shouldered parts adapted to occupy said grooved sides of the casing, means whereby the casing and the shackle are adapted to interlock with each other, and a separate member insertible in the grooved sides of the casing and adapted for engagement with the shouldered parts of the shackle, said casing being open at its respective sides and said open parts of the casing being intermediate the grooved sides thereof, whereby the insertible separate member is adapted to substantially fill the open side portions of the casing and to be exposed to view exteriorly of said casing.

12. In a seal, a casing having grooved sides and provided on its respective faces with openings intermediate the grooved sides thereof, a shackle having shouldered parts adapted to occupy said grooved sides of the casing, means whereby the casing and the shackle are adapted to interlock with each other, and a frangible shouldered member insertible in the grooved sides of the casing and substantially filling the openings in the respective faces thereof, said frangible member being locked in position by the shouldered parts of the shackle.

13. In a seal, a casing having a transverse opening or slot, a shackle insertible into said casing and interlocking therewith, and a frangible member spanning the opening or slot of said casing and coöperating with the shackle to secure interlocking engagement between the shackle and the casing.

14. In a seal, a casing composed of rigid material and provided with shoulders internally thereof, a shackle having yieldable shouldered parts which are insertible into the casing, and a frangible shouldered mem-

ber adapted to be inserted in the casing and into locking engagement with said yieldable shouldered parts of the shackle.

15. In a seal, a casing provided with shackle-locking means, a shackle the legs of which are provided with locking means, and a member insertible into the casing and adapted to act upon the shackle legs for moving the locking means thereof into engagement with the shackle-locking means of the casing, said shackle having weakened portions which are insertible into the casing.

16. In a seal, a casing having shoulders internally thereof, a shackle provided on its legs with shoulders, a locking member cooperating with the legs of the shackle to secure interlocking engagement between the shoulders of the casing and the shackle, and means for retaining the locking member in position relative to the casing.

17. In a seal, a casing, a shackle provided with shoulders which engage with the casing and provided, also, with other shoulders adapted to be housed within said casing, and a locking member composed of frangible material and insertible into the casing, said locking member having interlocking engagement with the second named shoulders of the shackle to preclude the latter from movement in one direction relative to the casing, said shackle being retained from movement in an opposite direction by the engagement of the first named shoulders with said casing.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN L. DINSMOOR.

Witnesses:
H. I. BERNHARD,
V. E. MARKMANN.