No. 612,335. Patented Oct. 11, 1898.

C. J. HAGGSTROM.

PERMUTATION LOCK.

(Application filed Feb. 28, 1898.)

(No Model.)

Fig. 1.

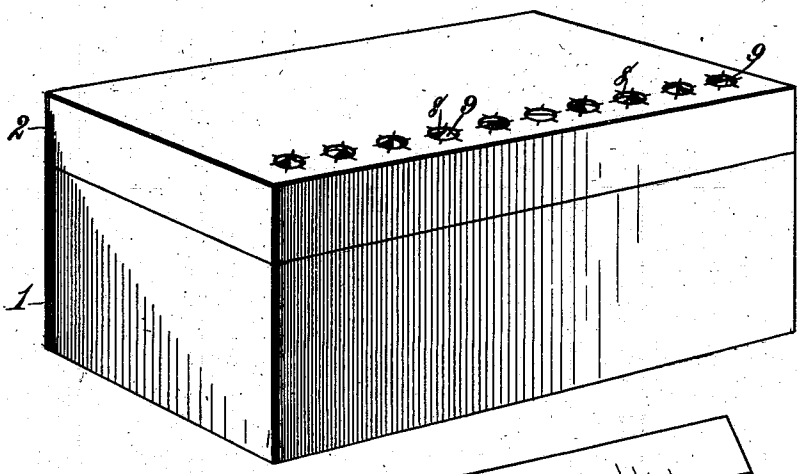


Fig. 2.

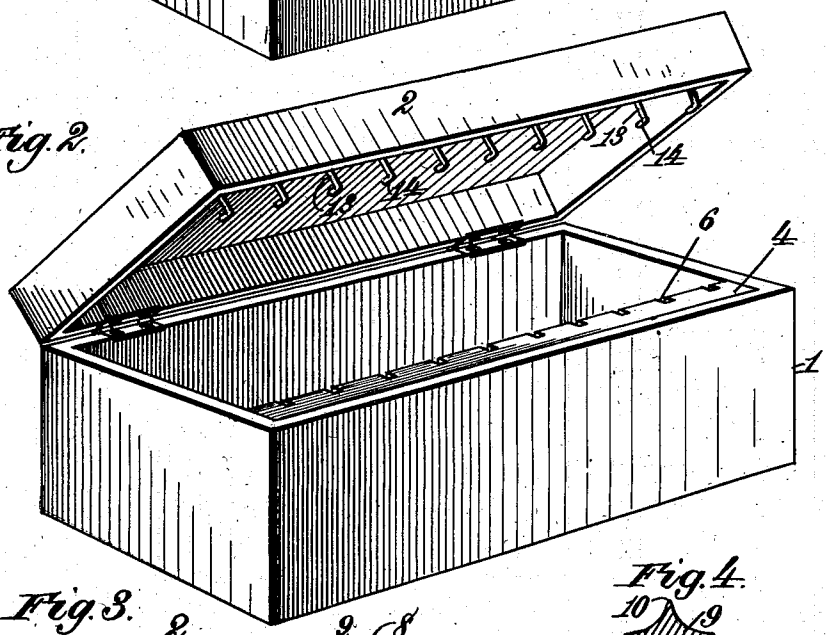


Fig. 3.

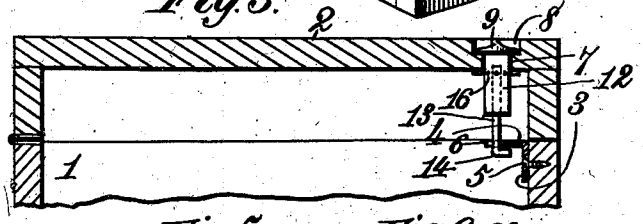


Fig. 4.

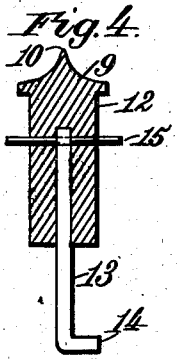


Fig. 5.

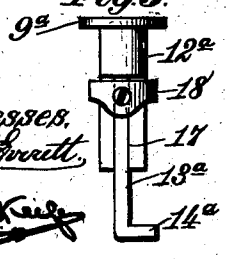


Fig. 6.

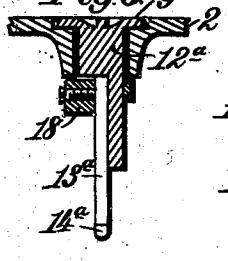
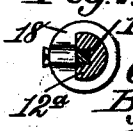


Fig. 7.



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UNITED STATES PATENT OFFICE.

CHARLES J. HAGGSTROM, OF WARREN, PENNSYLVANIA.

PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 612,335, dated October 11, 1898.

Application filed February 28, 1898. Serial No. 672,080. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. HAGGSTROM, a citizen of the United States, residing at Warren, in the county of Warren and State of Pennsylvania, have invented new and useful Improvements in Permutation-Lock Boxes or Chests, of which the following is a specification.

This invention relates to that class or type of boxes or chests having a plurality of permutation-locks secured in the box-cover and provided with hooked shanks operating in connection with a plate secured in the box-body and having slots with which the hooked shanks may be made to engage and disengage for the purpose of locking and unlocking the box.

The chief object of my present invention is to improve permutation-lock boxes of the character referred to, to provide novel, simple, efficient, and economical permutation-locking devices for boxes, chests, and analogous structures, to provide a box or chest with a plurality of independent permutation-locks having adjustable or changeable hooked bolts or shanks which coöperate with a fixed plate constructed with edge notches for locking and unlocking the box, and to provide a permutation-lock box of the character above referred to wherein the finger-pieces which are manipulated to lock and unlock the box are located in countersunk portions of the box-cover and do not measurably project above or from the level or surface of the top of the box-cover in such manner that while the box is provided with a plurality of independently-operated permutation-locks no part of the latter will offer any obstruction at the exterior of the box, which is advantageous and desirable in combination or permutation lock boxes of the kind above mentioned.

To accomplish all these objects, my invention involves the features of construction, the combinations or arrangements of parts, and the principles of operation hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a perspective view, on a small scale, of a box, chest, or analogous structure provided with a line or row of permutation-locks constructed in accordance with my invention. Fig. 2 is a detail perspective view showing the box-cover raised for the purpose of clearly illustrating the hooked shanks on the box-cover and the notched angle-plate on the box-body. Fig. 3 is a transverse sectional view through the box, taken on a line coincident with the center of the hooked shank of one of the locks. Fig. 4 is a detail sectional view of one of the locks. Fig. 5 is a detail side elevation showing a modified construction of the lock. Fig. 6 is a vertical sectional view of the same, and Fig. 7 is a transverse sectional view thereof.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates the body of a box, chest, or analogous structure, and 2 the hinged box-cover or lid. These parts may be of any form, shape, configuration, or construction, and therefore more detailed description of the same is deemed unnecessary.

The front longitudinal edge of the box-body is provided with a rigidly-attached locking-plate composed of a metallic angle-iron of a length coequal with the length of the interior of the box between its end walls. The angle-iron comprises a vertical flange 3 and horizontal flange 4. The flange 3 is rigidly secured to the inside of the front wall of the box-body through the medium of screws 5 or other suitable fastening devices, and the flange 4 projects horizontally toward the rear wall of the box, and in its edge at suitable distances apart are formed rectangular or other suitably-shaped notches 6. In the present instance I have represented ten notches in the horizontal flange 4, because there are ten permutation-locks mounted on the cover, as will hereinafter appear; but the number of notches may be increased or diminished to suit the conditions required, according to the number of permutation-locks secured in the box-cover or lid.

The top wall of the box-cover 2 is constructed near its front edge with a line or row of vertical orifices 7, having their upper ends countersunk, as at 8, so that the finger-pieces of the permutation-locks may occupy the countersunk portions and lie flush or substantially flush with the top surface of the

box-cover. Inasmuch as ten locking-notches are represented in the locking angle-plate there should be ten independent permutation-locks constructed according to my invention arranged in the top wall of the box-cover.

The permutation-locks are each composed of a V-shaped button or head 9, having a rectilinear edge 10 at its apex, shaped similar to a knife-edge. The button or head is provided with an attached tubular extension 12, circular in cross-section and more or less accurately fitting one of the orifices 7, so that the tubular extension can be turned in the orifice by turning the button or head. The tubular extension of each lock contains a removable and replaceable shank 13, having a hook 14 at its lower or outer end, designed to coöperate with one of the notches 6 in the notched angle-iron, as will hereinafter appear. The shank of the hook accurately fits the bore in the tubular extension and is confined in a fixed position relatively to the latter through the medium of a transverse pin 15, passing through the tubular extension and through an orifice in the upper or inner end of the shank of the hook. The tubular extension is constructed with several perforations, as at 16, for the passage of the pin 15, so that by removing the pin the hooked shank can be detached from the tubular extension and then again inserted thereinto and secured by the pin for the purpose of varying the position of the hook 14 relatively to the rectilinear knife-edge 10, forming the apex of the button or head 9—that is to say, the hooked shanks can all be transposed or interchanged and the relative positions of their hooks altered more or less relatively to one another and to the direction of the rectilinear knife-edges on the buttons or heads. The purpose of this is to enable the notches in the locking angle-plate to be indiscriminately or orderly arranged in various positions or angles relatively to the front of the box.

The top surface of the box-cover is provided in juxtaposition to the circular edges of the countersunk portions 8 with diacritical marks or indexes to coöperate with the knife-edges on the buttons or heads, the construction being such that an authorized person acquainted with the necessary adjustments of the buttons or heads can register the knife-edges of such buttons or heads with the required diacritical marks, which serve as gages or guides, for the purpose of causing the hooks 14 of all the shanks 13 to register with the notches in the locking angle-plate, thereby rendering it possible to lock or unlock the box, as will be obvious. To close and lock the box-cover, the hooks 14 of all the shanks must be so adjusted through the medium of their buttons or heads that they will pass through the notches in the locking angle-plate when the box-cover is closed, and subsequently the buttons or heads can be more or less turned, so that the hooks of the shanks are moved out of coincidence with the notches in the locking angle-plate. By this adjustment of the parts the box is securely locked and cannot be opened, except by a person acquainted with the exact manner in which the knife-edges on the buttons or heads must be adjusted with relation to the proper diacritical marks to register the hooks of the shanks with the notches in the locking angle-plate, whereupon the box can be opened.

By making the locking-plate in the form of an angle-iron, as described and shown, a very strong and durable locking-plate is provided and in connection with the permutation-locks in the cover makes it impossible to pry the box open.

If the arrangement of the hooks 14 be adjusted or altered to vary their relation to one another, the locking-notches in the metallic angle-iron may be so disposed as to coöperate with the particular adjustment of the hooks of the shanks. Inasmuch as the position of the hooks can be largely varied relatively to one another, thus securing new combinations, it seems proper to term the locks "permutation-locks," in that the arrangement or order of the locking-hooks can be varied, which necessitates a different manipulation of the buttons or heads for the purpose of working out the combination or permutation and opening the box.

In Figs. 5, 6, and 7 of the drawings I illustrate a slightly-modified construction of permutation-lock. In this instance the button or head 9^a is constructed with an extension 12^a, which is circular adjacent to the button or head and for the remainder of its length is substantially semicircular in cross-section. The flat side of this extension is formed with a groove 17, into which the shank 13^a of the hook 14^a is fitted.

A collar 18 encircles the extension and the shank and is provided with a set-screw which when tightened up clamps the collar to the extension 12^a and rigidly holds the shank of the hook in the extension. The collar can be readily removed for the purpose of reversing the shank in order to adjust the hook of the shank and causing it to extend in any desired direction relatively to the knife-edge on the button or head.

Having thus described my invention, what I claim is—

1. The combination with a fixed locking-plate having a plurality of notches or recesses, of a plurality of locks, each consisting of a button or head having a knife-edge on its upper side, a tubular extension, and a shank removably secured in the tubular extension and provided with a hook, substantially as described.

2. The combination with a box-body, and a box-cover having a row of countersunk orifices in its top wall, of a locking-plate rigidly fixed in the box-body and constructed with a plurality of notches or recesses, and a plurality of permutation-locks, each composed of a

button or head lying in one of the said countersunk portions, an extension working in one of said orifices, and a shank detachably secured to the said extension and provided with a hook, substantially as described.

3. The combination with a box-body, of a box-cover having a row of orifices in its top wall, each formed with a countersink at its outer portion, a locking-plate rigidly secured in the box-body and having a plurality of locking notches or recesses, and a series of locks carried by the cover, each lock consisting of a button or head lying in one of the countersinks to be flush with the top surface of the cover, an extension projecting from the button or head and working in one of the orifices, and a shank detachably secured to the said extension and having a hook, substantially as described.

4. The combination with a box-body, and a box-cover having a row of orifices in its top wall, each formed with a countersink at its outer portion, a locking-plate rigidly secured in the box-body and having a plurality of locking notches or recesses, and a series of locks carried by the cover, each lock consisting of a button or head lying in one of the countersinks to be flush with the top surface of the cover, an extension projecting from the button or head and working in one of the orifices, and a shank secured to the said extension and having a hook, substantially as described.

5. The combination with a fixed locking-plate having a plurality of notches, of a series of permutation-locks, each consisting of a button or head having an extension, a shank detachably fitted in said extension and having a hook, a collar encircling said extension and shank, and a set-screw carried by the collar for clamping the hooked shank in any position to which it may be adjusted, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHARLES J. HAGGSTROM.

Witnesses:
CHAS. DINSMORE,
E. H. BESHLIN.