

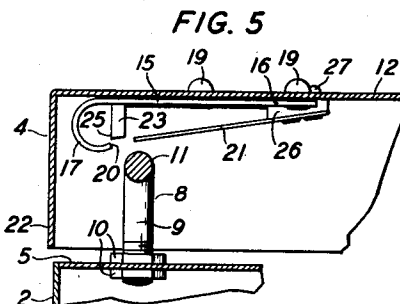
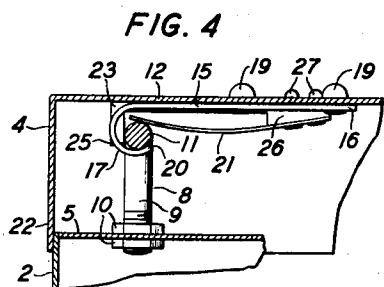
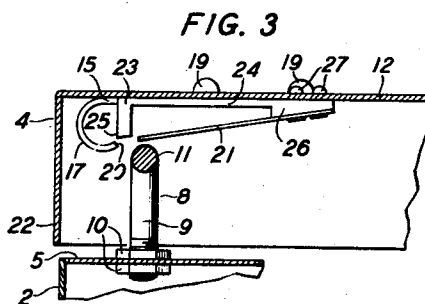
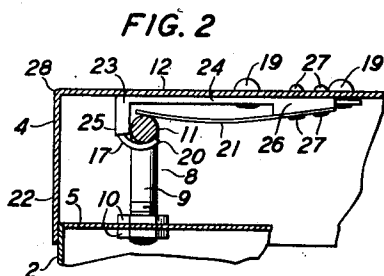
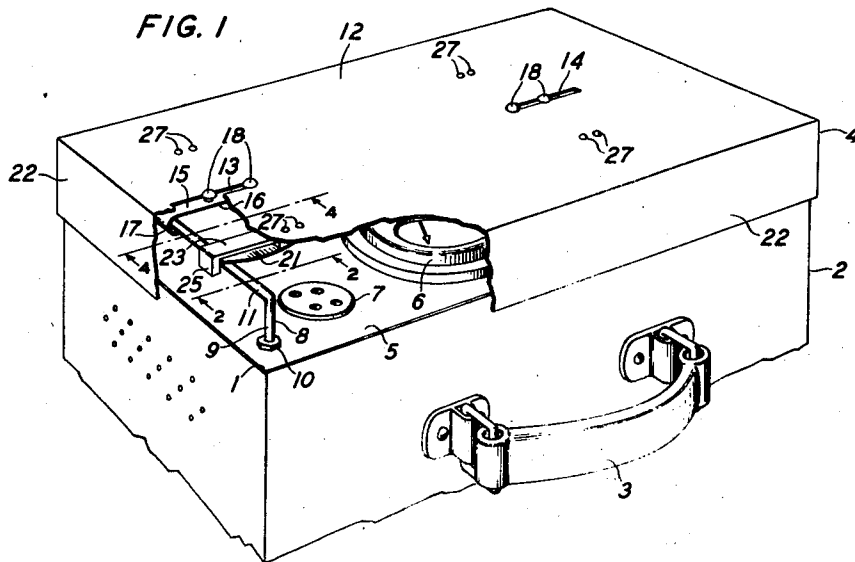
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LATCH APPARATUS

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LATCH APPARATUS

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3 Claims. (Cl. 292—302)

This invention relates to latch apparatus and more particularly to latch apparatus adapted to hold the lid of a casing in place.

The object of the invention is to provide a latch suitable for holding a lid in place over apparatus enclosed in the casing.

A feature of the invention resides in the combination of hook and spring members supported in the lid and adapted to engage handle members of an apparatus unit enclosed in the casing.

Another feature resides in brackets supported in the lid and bearing against the handle members to prevent longitudinal movement of the lid such as might cause unlatching of the parts.

In the drawing:

Fig. 1 is a view in perspective and partly in section of a portion of the casing with the lid thereon;

Fig. 2 is a side view, partly in section, of a portion of the casing, the lid and the apparatus unit, taken on the line 2—2 in Fig. 1, and shows one of the hook members in engagement with the handle of the apparatus unit;

Fig. 3 is a view corresponding to Fig. 2 but showing the lid released;

Fig. 4 is a view corresponding to Fig. 2 but taken on the line 4—4 in Fig. 1; and,

Fig. 5 is a view corresponding to Fig. 4 but showing the lid released.

In portable electrical apparatus units and particularly in electrical testing units, it is found desirable in some instances to have handle members provided on the apparatus unit and to have the apparatus unit enclosed in a protective casing. A removable lid is provided as part of the casing structure so that access may be had to parts of the electrical apparatus unit.

In this invention an electrical apparatus unit provided with handles to facilitate lifting of the apparatus unit is enclosed in a suitable casing equipped with a removable lid. The handles of the apparatus unit extend toward the lid and latch members are provided on the inside of the lid to engage the handles of the apparatus unit.

As shown in Fig. 1 an electrical apparatus unit 1 is set down within a box-like casing 2. The casing 2 is open at the top and is equipped with a carrying handle 3. A removable lid 4 is provided to fit over the top of the casing 2. The apparatus unit 1 may be, for instance, an electrical testing unit comprising a panel 5 on which are suitably supported electrical apparatus parts among which are indicating instruments 6 to be observed in making required tests and connect-

ing means 7 for connecting wires or electrical elements to the testing unit.

The electrical apparatus unit 1 is equipped with handles 8 to facilitate lifting of the apparatus unit. The handles 8, only one of which is shown, are provided at suitable points to facilitate lifting of the apparatus unit. The number of handles 8 provided on the electrical apparatus unit 1 will depend on the design, character or weight of the apparatus unit 1 and the location of the handle or handles may be at points other than those shown. In an apparatus unit of the form shown, however, I have found it advisable to have one handle 8 located near one end of the apparatus unit and to have another handle of the same form located near the other end of the apparatus unit.

The handles 8 are substantially U-shaped in form and are set in inverted position relative to the upper surface of the panel 5. The leg portions 9 are suitably anchored in the panel 5 and are held in place, for instance, by means of the nuts 10 arranged in pairs and located on opposite sides of the panel 5 as shown in Figs. 2, 3, 4 and 5. A rather long straight bar portion 11 of the handle 8 extends in elevated position across the panel 5 and in spaced relation with and parallel to the under surface of the top 12 of the lid 4. An elongated aperture 13 is provided in the top 12 of the lid 4, one end of the aperture 13 being located in the vicinity of the central portion of the bar portion 11 of the handle 8 and the aperture 13 extending inwardly therefrom toward the center of the lid 4. An elongated aperture 14 is provided near the other end of the lid 4 in the vicinity of the other handle 8 (not shown). For each handle 8 there is a latch bar 15 comprising a straight flat bar portion 16 and a hooked end portion 17. The bar portion 16 is equipped with studs 18—18 which are disposed in spaced relation on the bar portion 16 and extend upwardly through the elongated aperture in the lid. The studs 18 are enlarged on the upper ends to form hemispherical head portions 19. The head portion 19 is larger in diameter than the width of the aperture 13 and extends over a portion of the upper surface of the top 12 of the lid 4. The studs 18—18 hold the bar portion 16 of the latch bar 15 loosely against the under surface of the lid 4, so that the latch bar 15 may be slid relative to the handle 8 of the apparatus unit 1. The sliding of the latch bar 15 may be accomplished by applying a pressure laterally against the head portions 19 of the studs 18 and longitudinally of the

latch bar. The hooked end portion 17 of the latch bar 15 is designed to partially encircle the straight bar portion 11 of the handle 8 and extends downward from the bar portion 16 to pass below the lower surface of the bar portion 11 of the handle, and has an upwardly curved end portion 20 as shown in Figs. 2, 3, 4, and 5 which extends slightly above the lower surface of the bar portion 11 of the handle when the lid 4 is in normal latched position as shown in Figs. 1, 2 and 4.

The lid 4 is equipped with leaf-spring members 21, only one of which is shown. The leaf-spring members 21 are provided to normally maintain the lid 4 in slightly elevated position so that the hooked end portion 17 of the latch bar 15 will be pressed upwardly into engagement with the under surface of the bar portion 11 of the handle 8. When the lid 4 is elevated by means of the springs 21 as shown in Figs. 1, 2 and 4, so that the hooked end portion 17 of the latch bar 15 is pressed against the under surface of the bar portion 11 of the handle 8, and the curved upwardly extending end portion 20 is above the lower surface of the bar portion 11 of the handle, the latch bar can not be slid longitudinally to bring the latch bar out of engagement with the handle. In this position, therefore, the lid 4 is securely latched to the handle 8 of the apparatus unit 1. In the structure illustrated in Fig. 1, it is contemplated to provide two leaf-spring members 21 to engage each handle 8. The leaf-spring members 21 are arranged at spaced points along the bar portion of the handle and relative to the position of the latch bar so that the latch bar occupies the position between the two spaced leaf-spring members.

The lid 4 has downwardly extending side and end walls 22 arranged to telescopically encompass the upper edge portions of the casing 2 when the lid 4 is in normal position. L-shaped brackets 23 are secured to the under surface of the top of the lid 4. The brackets 23 serve as mounting means for the leaf-spring members 21 and also as means to prevent longitudinal movement of the lid 4 relative to the casing 2. The brackets 23 are made of substantially strong material and each bracket comprises a relatively long leg portion 24 terminating at one end in a downwardly extending shorter leg portion 25 and at the other end in a block portion 26. The block portion 26 is fastened against the under surface of the top of the lid 4 by suitable fastening means such, for instance, as the rivets 27. The under surface of the block portion 26 is beveled to provide an inclined surface to receive one end of the leaf-spring 21, the leaf-spring 21 being anchored at one end to the inclined surface of the block portion 26 so that the free end portion of the spring will extend diagonally downward from the point of anchorage toward and almost to the lower end of the leg portion 25 of the bracket as shown in Figs. 3 and 5. The free end portion of the spring 21 is adapted to bear against the upper surface of the bar portion 11 of the handle 8 when the lid 4 is applied. The leg portion 25 of the bracket 23 is arranged to pass downwardly alongside of the outer side of the bar portion 11 of the handle 8 when the lid is applied to the casing. The latch bar 15 may be slidably moved to bring the hooked end portion 17 to a position sufficiently offset from the position of the handle 8 that these parts will not be engaged during the placement or removal of the lid. When the lid 4 is applied to the casing 2 contain-

ing the apparatus unit 1 and a suitable downward pressure is applied to the lid 4 to bring the hooked end portions of the latch bars 15 below the level of the under surface of the bar portions 11 of the handles, the latch bars 15 may be slid longitudinally toward the central portion of the lid to bring the hooked end portions of the latch bars into register with the bar portions 11 of the handles. In applying the pressure above-mentioned to the lid 4, the free ends of the springs 21 are pressed upward and spring pressure is developed in the spring members 21. When the pressure applied to the lid is discontinued, the lid 4 is moved slightly upward by means of the springs 21 and the upwardly curved end portions 20 of the latch bars 15 are brought slightly above the lower surface of the bar portions 11 of the handles as shown in Figs. 2 and 4. In this position the lid 4 is securely latched to the handles 8 of the apparatus unit 1. It is to be noticed that in the positions shown in Figs. 2 and 4, the leg portion 25 of the bracket 23 is against the outer side of the bar portion 11 of the handle and that a leg portion 25 of another bracket 23 located near the other end of the lid 4 will likewise be in engagement with the outer side of the bar portion 11 of a corresponding handle located at this end of the structure. The brackets 23 when in the positions above mentioned will prevent accidental disengagement of the latch bars 15 from the handles 8 of the apparatus unit 1. To further bring out the advantage of having the brackets 23 with their leg portions 25 engaging the sides of the bar portions 11 of the handles 8, let it be assumed that the leg portions 25 of the brackets are omitted. In this case should a lateral and slightly downward pressure be applied to an upper edge of one of the ends of the lid 4 sufficient to distort the lid, the latch bar at the other end of the structure might be brought out of engagement with its associated handle 8 since the whole latch bar structure at this end would be moved along with the lid 4 so that the hooked end portion 17 would be out of register with the handle 8 and the spring 21 would raise this end of the lid. The pressure, such as above mentioned, might be applied, for instance, by dropping the casing 2 onto a floor so that the impact would be received at the point 28 indicated in Fig. 2. Without the leg portion 25 on the bracket, such pressure would result in unlatching of the other end of the lid 4 and probably sliding of the latch bar at the end near the point of impact to a position where it would no longer engage the bar portion 11 of the associated handle. The leg portions 25 of the brackets 23, therefore, prevent accidental unlatching of the lid 4 from the handle of the apparatus unit 1.

When it is desired to remove the lid unlatching of the parts may be readily accomplished by simply pressing down on the lid to bring the upwardly curved ends 20 of the latch bars below the level of the lower surfaces of the bar portions 11 of the handles and by then sliding the latch bars so that the hooked end portions are out of register with the bar portions 11.

The hemispherical head portions 19 on the studs 18 supporting the latch bars 15 project only a slight distance above the upper surface of the lid 4 and are not very large in diameter. The head portions 19 are made hemispherical in form and are kept rather small in diameter for two reasons. One of the reasons is to insure that a downward pressure will be applied to

the lid when a lateral pressure is applied to the studs. The other reason is to keep the upper surface of the lid substantially free of relatively large projections. Since the head portions 19 of the studs are small and are rounded on the upper surface the natural thing for a person to do in applying a lateral pressure to the head portion 19 is to bear downwardly on the studs while applying the lateral pressure. The downward pressure flexes the springs 21 and moves the lid sufficiently downward to bring the upturned end portions 20 of the latch bars below the lower surfaces of the bar portions 11 of the handles. The lateral pressure applied at the same time to the head portions 19 of the studs moves the latch bars to positions where they will not engage the handles when the downward pressure on the lid is discontinued. Since the latch bars 15 are free of any springs directly bearing against them and are quite free to slide relative to the handles when the lid is downwardly pressed no large handles are required on the latch bars. The lid 4 being free of any handles or other relatively large projections another casing may be placed on top of it when the apparatus is being stored away or transported.

It is obvious that the latching means I have devised is applicable to casing structures other than the one shown and described and that some alterations may be made in the form and arrangement of the parts without departing from the spirit of the invention.

What is claimed is:

1. A latching device for the lid of a casing comprising a handle supported within the casing, a latch bar slidably supported in the lid and extending transversely of and over said handle, a hook-shaped end portion on said latch bar extending from above said handle and then

downwardly about and upwardly to partly encircle said handle, and spring means supported in the lid and bearing against the top of said handle and upwardly urging the lid and said latch bar so that said end portion of said latch bar is in hooked engagement with said handle.

2. A latching device for the lid of a casing comprising a U-shaped handle supported in inverted position within the casing, a latch bar slidably supported in the lid and extending transversely of and over said handle, a hook-shaped end portion on said latch bar extending from above said handle and then downwardly about and upwardly to partly encircle said handle and spring fingers supported in spaced relation in the lid and bearing against the top of said handle and upwardly urging the lid and said latch bar to maintain said latch bar in hooked engagement with said handle.

3. A latching device for the lid of a casing comprising a U-shaped handle supported in inverted position within the casing and in spaced relation with the lid, a latch bar slidably supported in the lid, a hook-shaped end portion on said bar extending transversely over and then downwardly of and upwardly about the central portion of said handle and terminating slightly above the lower surface of the central portion of said handle, an L-shaped bracket having one of its leg portions lying along and secured to the inner face of the lid and having its other leg portion bearing against a side of said handle and a leaf spring secured at one end to the secured leg portion of said bracket and having its free end bearing downwardly against the top of said handle to slightly lift the lid and maintain the hook-shaped end portion of said latch bar in latching engagement with said handle.

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