March 5, 1968 W. E. ATKINSON 3,371,511

LATCH AND LOCK MECHANISM

Filed July 21, 1966

Fig-1

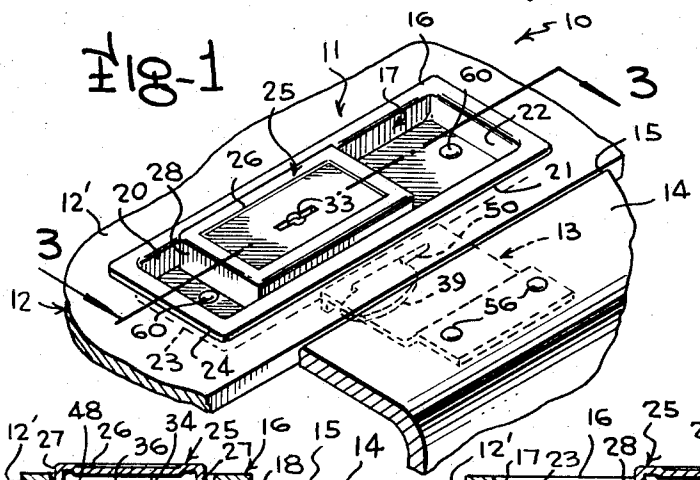


Fig-3

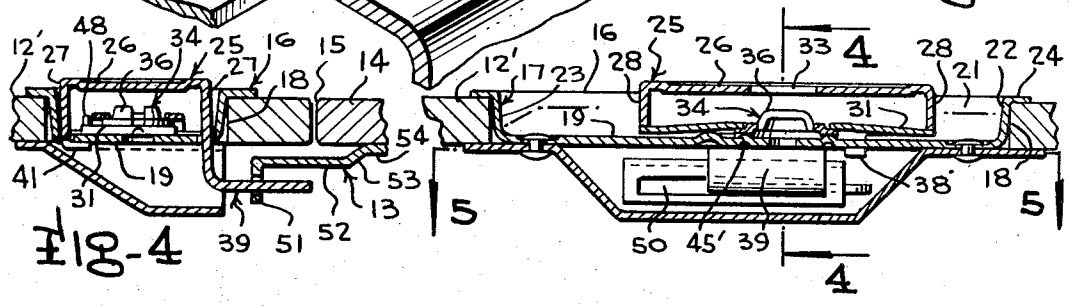


Fig-4

Fig-2

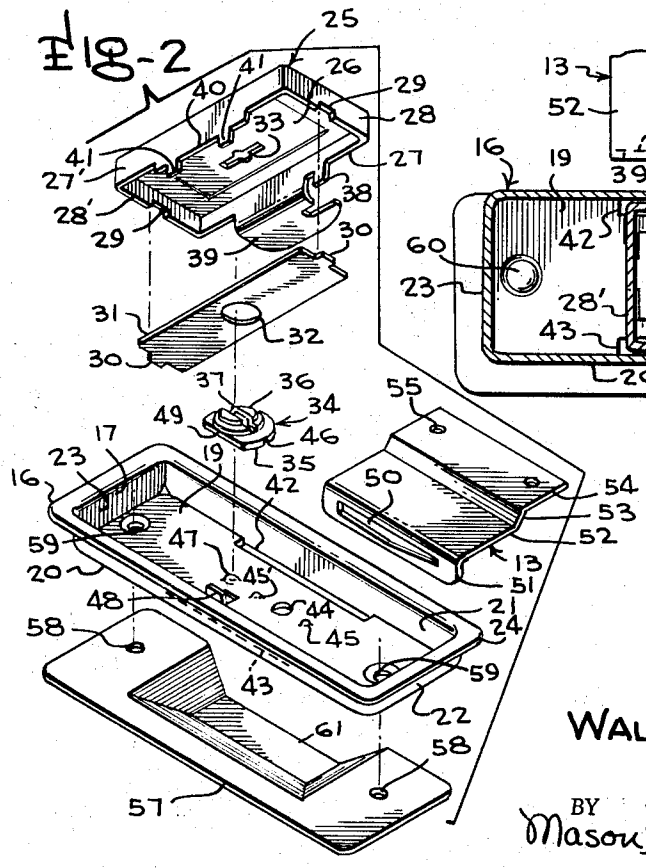
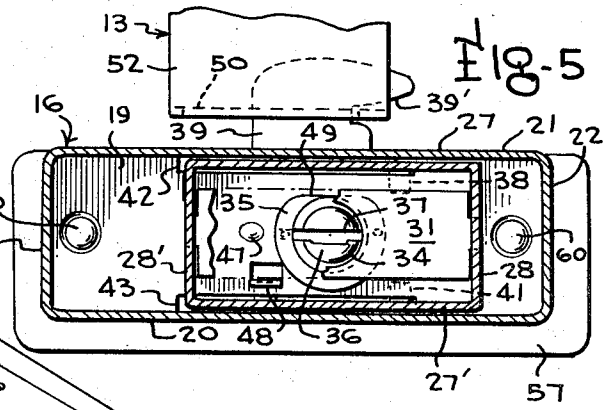


Fig-5



INVENTOR

WALLACE E. ATKINSON

BY Mason, Fenwick & Lawrence

ATTORNEYS

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LATCH AND LOCK MECHANISM

Wallace E. Atkinson, Dinwiddie County, Va., assignor to Long Manufacturing Co., Inc., Petersburg, Va., a corporation of Virginia

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9 Claims. (Cl. 70—71)

The present invention relates in general to a combined latch and lock structure especially adapted for application to containers or receptacles having separable parts to be releasably secured in closed position, and more particularly to a combined latch and lock structure for luggage cases and similar containers having a cover section hinged to a body section, wherein the latching and locking components of the mechanism are located in a well member and slidably disposed therein to normally lie substantialy flush or in semi-recessed relationship with the adjacent surface of the luggage.

It has been the usual practice for many years in the design and construction of combined latch and lock mechanisms for luggage cases and the like to provide a spring biased bolt on one of the separable container sections which is urged into latching relation with a keeper on the other separable case section whenever the sections are moved to a closed relationship. If a movable finger piece of some sort were provided in such prior devices to permit the operator to overcome the spring bias and release the latch, it usually constituted a projection or extension from the lock body or casing disrupting the continuity and artistic appearance of the casing.

Recently, it has become very popular in the luggage industry to provide a channel shaped extrusion at the line of juncture between the cover section and body section of the luggage, or adjacent this line of juncture, commonly referred to as a valance, to provide an outwardly opening channel or groove extending entirely around the luggage into which the lock mechanism and frequently the hinge mechanisms, are mounted so that they are either flush with the surface of the case, or nearly so. An example of such valance strip is found in the Axtell patent, No. 2,950,793. Such a valance type construction involves the use of a rather expensive valance extrusion, to provide the channel strip, and introduces complexities into the manufacture of the luggage because ofthe need to incorporate the valance strip therein with the outer edge of the valance strips substantially flush with the adjacent surface of the luggage. Also, when the latch and lock mechanism is to be recessed into the channel or groove defined by the valance strip, a relatively wide channel must be provided having sufficient transverse width to accommodate the lock structure.

An object of the present invention is the provision of a novel latch and lock structure which may be assembled with the luggage in semi-recessed relationship with a wall of the luggage, disposing the outer surface of the latch and lock mechanism substantially flush with the surface of the case, without the use of a valance, or with the use of a very narrow valance by mounting the structure beside, rather than into, the groove defined by the valance.

Another object of the present invention is the provision of a combined latch and lock structure designed to be mounted in a shallow rectangular well or cup recessed into the surface of the case, having relatively small transverse and longitudinal dimensions to occupy only a small area of the case.

Yet another object of the present invention is the provision of a novel combined latch and lock structure of the above-defined type, which is simple and compact in construction, attractive in appearance and reliable in operation, and which is capable of manufacture in an economical manner.

Another object of the present invention is the provision of a combined latch and lock structure associated with a rectangular shallow well or cup recessed into the surface of the case, wherein the latch and lock components are mounted in a rectangular, slidable housing of shallow depth recessed into the rectangular well or cup for limited longitudinal movement therein so as to normally lie substantially flush with the adjacent surface of the associated container or luggage, wherein the limited longitudinal movement of the latch and lock structure within the confines of the well releases the latch components from latching relation with the keeper.

Other objects, advantages, and capabilities of the present invention will become apparent from the following detailed description taken in conjunction with the accompanying drawing illustrating a preferred embodiment of the invention.

In the drawings:

FIGURE 1 is a perspective view of a combined latch and lock mechanism constructed in accordance with the present invention and shown in position on a portion of a luggage receptacle;

FIGURE 2 is an exploded perspective view of the components of the latch and lock mechanism;

FIGURE 3 is a longitudinal sectional view, to enlarged scale, of the latch and lock mechanism and associated well member, taken along the line 3—3 of FIGURE 1;

FIGURE 4 is a transverse section view taken along the line 4—4 of FIGURE 3; and

FIGURE 5 is a section view through a plane intermediate the front and rear latch and lock mechanism assembly, taken along the line 5—5 of FIGURE 3.

Referring to the drawings, wherein like reference characters designate corresponding parts throughout the several figures, the combined latch and lock structure of the present invention is indicated generally by the reference character **10** and comprises a latch section **11**, which may, for example, be mounted on a tray or body portion **12** of the luggage case, and a keeper **13** which may be mounted on the separable cover section **14** of the luggage case. Such latch section and keeper are usually mounted on the front wall of their respective receptacle sections adjacent the plane of separation between the receptacle body and cover, indicated by the reference character **15**.

The latch section **11** comprises a well or cup member **16** of generally rectangular configuration, stamped for example, from sheet metal, having its major dimensions extending horizontally on the front wall of the luggage case, the well or cup member **16** having a rectangular well portion **17** projecting through a suitable accommodating opening **18** cut in the front wall **12'** of the luggage or container. The well **17** is bounded by a planar base panel **19**, parallel bottom and top walls **20** and **21** extending perpendicular to the base wall **19**, and parallel end walls **22** and **23** extending also perpendicular to the base wall **19**. The marginal portions of the cup member **16** on all sides thereof extend outwardly beyond the well forming walls and define an integral rectangular frame **24** which is designed to butt against the front surface of the wall **12'** of the luggage and define mounting and locating flanges to be disposed flush against the surface of the luggage case wall **12'**.

Recessed within the well defined by the well member **17** is a rectangular lock housing member **25** having a substantially planar outer wall **26** forming the front wall thereof, and inwardly projecting flanges along the longitudinal and transverse edges of the panel **26** to form an inwardly opening box-like structure. The spacing between

the flanges 27 and 27' at the longitudinal edges of the panel 26 is substantially the same as the spacing between the well bounding walls 20 and 21 while the longitudinal spacing between the end flanges 28, 28' is much less than the longitudinal length of the wall.

The rearmost edges of the flanges 27, 27', and 28, 28' lie in a common plane paralleling and spaced rearwardly from the plane of the outer wall 26 of the lock housing member 25 and the end flanges 28, 28' near the centers thereof have notches 29 therein to receive correspondingly shaped tongues 30 on a bearing plate 31 which longitudinally spans the length of the housing member 25 and is disposed in the plane of the rearmost edges of the flanges 27, 27' and 28, 28'. The center of this bearing plate 31 has a circular hole 32 therein aligned with the key admitting opening 33 in the outer wall 26 to form a journal opening for a rotatable key barrel and bolt member 34. The key barrel and bolt member 34 may be conveniently stamped from a generally circular piece of sheet metal and comprises a peripheral flange portion 35 and a forwardly projected central portion of generally cylindrical configuration, indicated at 36, of appropriate diameter to project through the bearing opening 32 in the plate 31 while the flange portion 35 bears against portions of the plate 31 bounding the central opening 32. A diametric slot 37 is formed in the cylindrical portion 36 and may project a slight distance into the adjoining flange portion 35, passing entirely through the key barrel and bolt member to receive the key bit. The key barrel and bolt member 34 is designed to be slidably supported against the forwardly facing surface of the base panel 19 of the well or cup member 16, its peripheral flange portion 35 being held between the bearing plate 31 and the base panel 19 for sliding movement on the base panel with the lock housing member 25. The top flange 27 has a bendable tab 38 and a hook-like extension 39 disposed in side-by-side relation extending from the rear edge thereof, while the bottom flange 27' has an extension 40 projecting from the rearmost edge thereof of substantial length along the longitudinal axis of the lock assembly, having a pair of longitudinally spaced bendable tabs 41 projecting therefrom. The bendable tab 38 and hook-member 39 are designed to be passed through an accommodating elongated slot 42 in the base panel 19, while the extension 40 and its associated bendable tabs 41 are to be projected through an accommodated elongated slot 43 paralleling the slot 42, after which the bendable tabs 38 and 41 are bent inwardly against the underside of the base panel 19 to retain the lock housing member 25 in assembled relation in the well or cup member 16. The slots 42 and 43 are of appropriate length paralleling the longitudinal or major axis of the well member to accommodate an appropriate extent of reciprocative movement of the housing member 25 between latching and unlatching positions.

A circular opening 44 is provided in the base panel 19 aligned with the center axis of the key barrel and bolt member 34 when the lock housing member 25 is at its latched limit position to receive the narrow end of the key bit, and is flanked by a pair of outwardly projecting dimples or indentations 45, 45', aligned with the center of the opening 44 along an axis paralleling the longitudinal axis of the well member 16 to coact with shallow notches or indentations 46 at two diametrically opposed points on the rearwardly facing surface of the peripheral flange portion 35 of the key barrel and bolt member 34 to frictionally locate the key barrel and bolt member at two 180° positions. A further dimple or indentation 47 is disposed in alignment with the dimples 45, 45' along the path of movement of the lock housing member from the latched to the unlatched position, to register with the adjacent notch in the flange 35 of the key barrel and bolt member 34 as the lock housing member 25 is shifted to the unlatched position, to restrain the key barrel and bolt member 35 against accidental rotation during such movement, the additional dimple 47 being somewhat elongated if desired. An inwardly projected lock tongue 48 is also provided at an appropriate place in the base panel 19, forming a forwardly or outwardly projecting abutment located immediately adjacent the perimeter of the peripheral flange portion 35 of the key barrel and bolt member 34, when the lock housing member 25 is in the latched position, and disposed in the path of movement of a portion of the peripheral flange portion 35 between the perimeter thereof and its juncture with the cylindrical portion 36. A portion of the peripheral flange portion 35, however, is cut away substantially along a chord of the circle defined by the major portion of the perimeter of the flange portion 35, providing a flat 49 whose surface may become aligned with the surface of the tab or tongue 48 nearest the center axis of the key barrel and bolt member 34 so as to permit the flat 49 of the peripheral flange portion 35 to pass beside the locking tongue 48 when the flat 49 is appropriately aligned with the locking tongue 48 and the lock housing member is moved from the latched to the unlatched position.

The hook extension 39 of the lock housing member 25, as will be seen from FIGURES 1, 2 and 4, is bent at right angles beneath the associated front wall 12' in parallelism therewith, to extend to a point near the line of separation 15 between the body section 12 and cover section 14, and is designed to be received in a latching slot 50 in a keeper member 13 when the lock housing member 25 is in the unlatched position and the cover section 14 of the luggage is moved to closed position. The slot 50 is provided in the right angle flange 51 of the keeper 13, which lies in a plane extending substantially perpendicular to the plane of the front wall 12', the keeper 13 also having a body panel 52 extending from the flange 51 for a desired distance, jointed by an inclined portion 53 to a mounting panel portion 54 extending in offset parallel relation to the body panel 52 and having rivet openings 55 therein to receive rivets 56 by which the keeper is secured to the cover section 14 of the luggage. A lock guard plate 57 is also provided, which is substantially co-extensive with the bottom panel 19 of the well member 16, having rivet openings 58 therein aligned with rivet openings 59 in the base panel member 19. The well member 16 and lock guard member 57 are designed to be placed against the front and rear walls respectively of the front wall 12' of the body portion 12 and receive rivets 60 through the aligned rivet openings 58 and 59 to secure the assembly in place. An upwardly opening cavity 61 is shaped in the lock guard member 57 by stamping, providing an inwardly shielded space within which the hook extensions 39 of the lock housing portion can work.

In the assembly of the lock structure, the bearing plate 31 is positioned with its tongues 30 registered in the notches 29 in the end flanges 28, 28' of the lock housing member 25, the key barrel and bolt member 34 is positioned with its cylindrical portion 36 projecting through the circular hole 32, and this subassembly, with the outer wall 26 of the lock housing member facing downwardly, is positioned in the well portion of the well or cup member 16 (likewise in inverted position) until hook member 39, the bendable tab 38, and the extension 40 with its bendable tabs 41, project through the slots 42, and 43 in the base panel 19 of the well member 15. The bendable tabs 38 and 41 are then bent inwardly toward each other against the face of the base panel 19 which will be disposed inwardly of the luggage to restrain the lock housing subassembly within the well portion for sliding movement within the limits defined by the slots 42, 43. The well portion 17 is then fitted into the oening 18 cut in the front wall 12' of the body portion 12, the lock guard member 57 is positioned against the inside surface of the front wall 12' in proper alignment with the well or cup member 16, and the rivets 60 are inserted through the aligned openings 59 and 58 and peened over to mount this assembly on the front wall 12'. The keeper member 13 is secured in conventional manner by rivets 56 on the

cover section **14**, the keeper being appropriately positioned so that the slot **50** therein will pass the elongated head portion of the hook extension **39** when the cover section **14** of the luggage is drawn to closed position and the lock housing member **25** is in unlatched position, and so that the flange **51** of the keeper will be aligned with the catch shoulder **39'** of the hook extension **39** when the cover section **14** is in fully closed position.

In the operation of the latch and lock structure, assuming the key barrel and bolt member **34** to be in locking position, with the flat **49** disposed in alignment with the locking tongue **48**, as it must be if the hook extension is to be in unlatched position, the lock housing member **25** is shifted from the unlatched limit position to the latched limit position, projecting the hook formation into the relative position with respect to the keeper **13** illustrated in FIGURE 5. The key may now be inserted in the key opening **33** and slot **37** of the key barrel and bolt member **34**, and turned through 180°, rotating the flat **49** out of alignment with the locking tongue **48**, so that the locking tongue **48** would be in the path of uninterrupted portions of the peripheral flange portion **35** of the key barrel and bolt member **34** if an effort were made to shift the lock housing member **25** back to the unlatched position. The registration of the notches **46** in the peripheral flange **35** with the dimples **45, 45'** on the base panel **19** serve to keep the key barrel and bolt member **34** in the locked or unlocked position in which it is disposed by a key. Operation of the lock to unlock and unlatch the same are merely the reversal of that just described.

While but one preferred example of the present invention has been particularly shown and described, it is apparent that various modifications may be made therein within the spirit and scope of the invention, and it is desired, therefore, that only such limitations be placed on the invention as are imposed by the prior art and set forth in the appended claims.

What is claimed is:

1. A combined latch and lock adapted to be mounted on first and second wall portions of separable parts of a container adjacent a line of separation therebetween for securing the parts together, comprising a keeper to be affixed to the first wall portion, said second wall portion having an opening therethrough bounded by interior and exterior surfaces of said second wall portion, a latching unit on said second wall portion including a cup member formed of an integral sheet metal stamping having marginal flanges disposed in a common plane to be mounted flush against said exterior surface and having side, end and base panel portions collectively defining an outwardly opening well extending inwardly through said opening in nested relation therein from said common plane and elongated along a major axis paralleling the plane of separation, said base panel portion generally paralleling said common plane and being spaced inwardly therefrom a distance corresponding to the thickness of said second wall portion disposing said base panel portion substantially flush with said interior surface, a movable latch member of narrower length than said well nested in said well, means slidably mounting said latch member in said well for rectilinear movement along the major axis of said well between a latching position and a release position displaced longitudinally from said latching position, and said latch member having catch means projecting into selected alignment with said keeper for interlocking engagement therewith when said latch member is in said latching position and said separable container parts are in closed condition and for releasing said keeper therefrom when said latch member is moved to said release position.

2. A combined latch and lock as defined in claim **1**, wherein said latch member comprises a latch housing formed of an integral sheet metal stamping having a box-like body including an outer rectangular panel and inwardly projecting side and end walls at the perimeter thereof extending at substantially right angles to the plane of said outer panel, said base panel having elongated slots therein paralleling said major axis, one of said sides including bendable tabs extending through one of said slots in said base panel and being bent thereunder and the other of said sides including a bendable tab and an angle shaped extension defining said catch means.

3. A combined latch and lock adapted to be mounted on wall portions of separable parts of a container adjacent a line of separation therebetween for securing the parts together, comprising a keeper to be affixed to the wall portion of one of the separable parts, a latching unit on an exterior surface of the wall portion of the other separable part including a cup member formed of an integral sheet metal stamping having marginal flanges disposed in a common plane adapted to be mounted flush against said exterior surface and having a base panel portion spaced inwardly from said plane paralleling the same and side and end wall portions collectively defining an outwardly opening well extending inwardly from said common plane and elongated along a major axis paralleling the plane of separation, a movable latch member of narrower length than said well nested in said well, said latch member having an outer surface substantially paralleling said base panel portion and located adjacent said common plane, means intercoupling said latch member with said base panel portion slidably supporting said latch member in assembled relation with said base panel portion for rectilinear movement along the major axis of said well between a latching position and a release position displaced longitudinally from said latching position, and said latch member including an integral catch element projecting therefrom through said base panel portion into selected alignment with said keeper for interlocking engagement therewith when said latch member is in said latching position and said separable container parts are in closed condition and for releasing said keeper therefrom when said latch member is moved to said release position.

4. A combined latch and lock as defined in claim **3**, wherein said well and said latch member are in the configuration of a rectangular solid, said latch member and well being of substantially corresponding width transversely of said major axis and the length of said well being substantially greater than the length of said latch member, and said marginal flanges defining an integral rectangular closed frame bounding the outer entrance to said well.

5. A combined latch and lock as defined in claim **4**, wherein said wall portions of said separable parts in the region of said latching unit and keeper are of comparable selected thickness having interior and exterior surfaces, the wall portion adjacent said latching unit having an opening therethrough sized to accommodate portions of said cup member defining said well in nested relation therein, the depth of said well corresponding substantially to the thickness of said wall portion whereby said base panel portion lies substantially flush with the interior surface of said wall portion when said marginal flanges are disposed flush against the exterior surface thereof, and said keeper being secured against the interior surface of the other of said wall portions.

6. A combined latch and lock as defined in claim **5**, wherein said latch member comprises a latch housing formed of an integral sheet metal stamping having a box-like body including an outer rectangular panel and inwardly projecting side and end walls at the perimeter thereof extending at substantially right angles to the plane of said outer panel, said base panel having elongated slots therein paralleling said major axis, one of said sides including bendable tabs extending through one of said slots in said base panel and being bent thereunder and the

other of said sides including a bendable tab and an angle shaped extension defining said catch element.

7. A combined latch and lock as defined in claim 6, wherein said latch member includes an integral disc-like member journaled therein forming a combined key barrel and bolt member, said disc member having a circular flange along the major portion of the perimeter thereof at one side of said disc member slidably bearing against said base panel portion and interrupted by a flat portion formed along a chord of said perimeter, said disc member having a key receiving opening therein for rotation of the same to selected locking and unlocking positions, said flat being aligned parallel to said major axis of said well in said unlocking position, and said base panel portion including an outwardly projecting integral tab adjacent said circular flange disposed in the path of uninterrupted portions of said disc member flange between the latching and release positions thereof to prevent movement of said latching member toward unlatching position when said disc member is in locking position and to permit passage of said flat portion alongside said tab when said disc member is in unlocked position.

8. A combined latch and lock as defined in claim 7, wherein said keeper has a terminal flange spaced inwardly of said interior surface of the wall portion associated therewith disposed in a plane lying perpendicular thereto and having an elongated interlock slot in said flange portion, and said catch element extending from one side of said latch member through an elongated slot in said base panel portion and terminating in a hook shaped catch tongue lying in a plane paralleling the plane of said interior surface of said wall portions disposed to extend through said interlock slot when said latch member is in release position and said separable parts are drawn into closed position, and said hook portion having a nose disposed to interlock with portions of said keeper flange when said latch member is shifted to latching position to prevent relative separation of said separable parts.

9. A combined latch and lock as defined in claim 3, wherein said latch member includes an integral disc-like member journaled therein forming a combined key barrel and bolt member, said disc member having a circular flange along the major portion of the perimeter thereof at one side of said disc member slidably bearing against said base panel portion and interrupted by a flat portion formed along a chord of said perimeter, said disc member having a key receiving opening therein for rotation of the same to selected locking and unlocking positions, said flat being aligned parallel to said major axis of said well in said unlocking position, and said base panel portion including an outwardly projecting integral tab adjacent said circular flange disposed in the path of uninterrupted portions of said disc member flange between the latching and release positions thereof to prevent unlatching movement of said latching member toward release position when said disc member is in locking position and to permit passage of said flat portion alongside said tab during such unlatching movement when said disc member is in unlocked position.

References Cited

UNITED STATES PATENTS

1,163,002	12/1915	Goddard	292—102
3,212,304	10/1965	Feinberg	70—71
3,245,236	4/1966	Atkinson	70—71

MARVIN A. CHAMPION, *Primary Examiner.*

E. J. McCARTHY, *Assistant Examiner.*