

United States Patent

[11] 3,590,609

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[54] **LATCH STRUCTURE**
11 Claims, 5 Drawing Figs.

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E05c 3/04, E05c 3/14

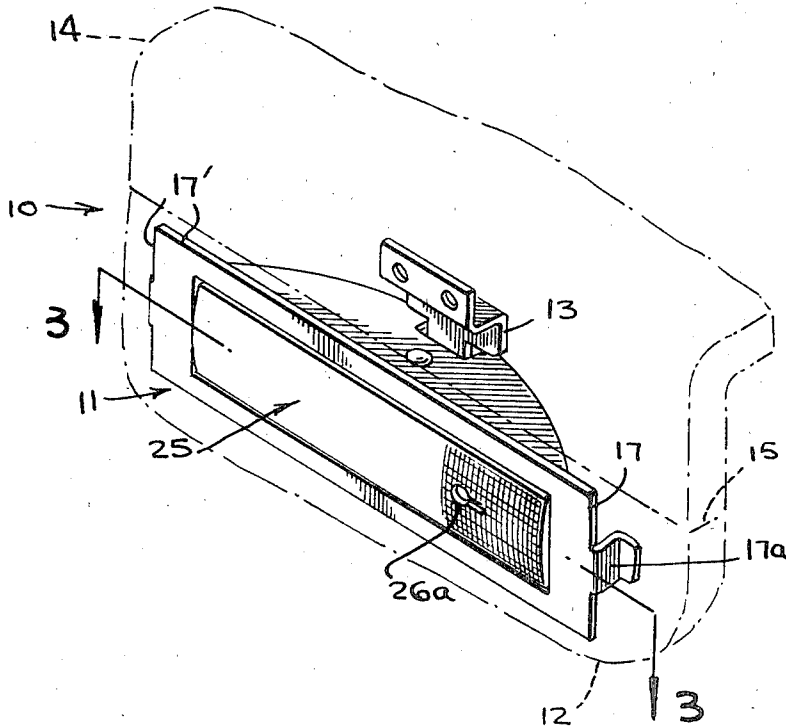
[50] **Field of Search**..... 70/69, 70,
 208, 134; 292/162

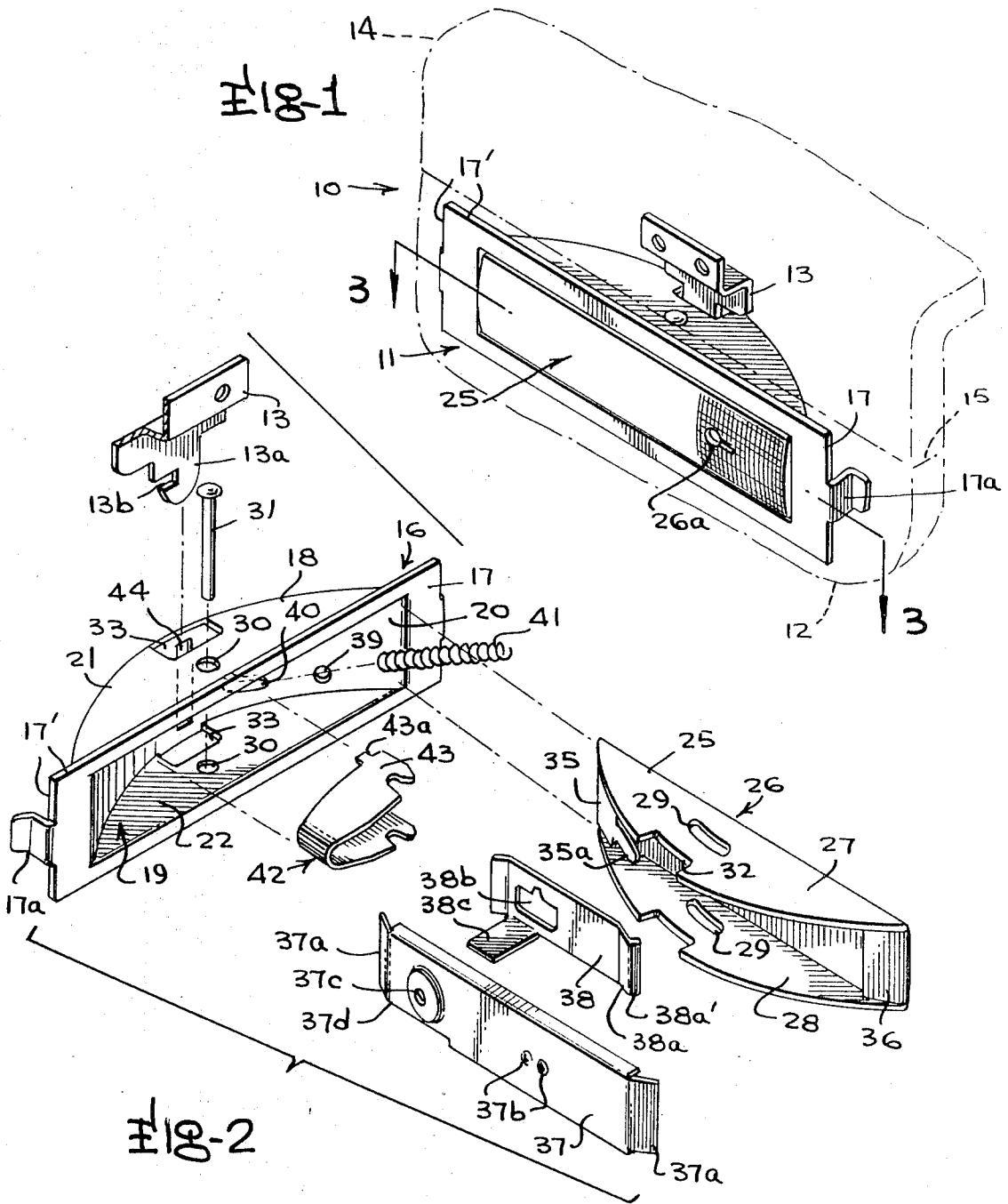
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ABSTRACT: A latch including lock means for luggage cases and the like including a keeper to be mounted on an upper case section, and a latch unit to be mounted on the lower case section. The latch section includes a housing defining a concave well and a latch member supported therefrom for circumferential movement between latch and unlatching positions. The latch member is formed of sheet material, having a bolt plate and retaining plate secured to a channel-shaped member by inwardly bent end flanges and a U-shaped spring housed therein to be stressed when the keeper advances through either of two opposite sides of the channel-shaped member to eject the keeper upon unlatching thereof.

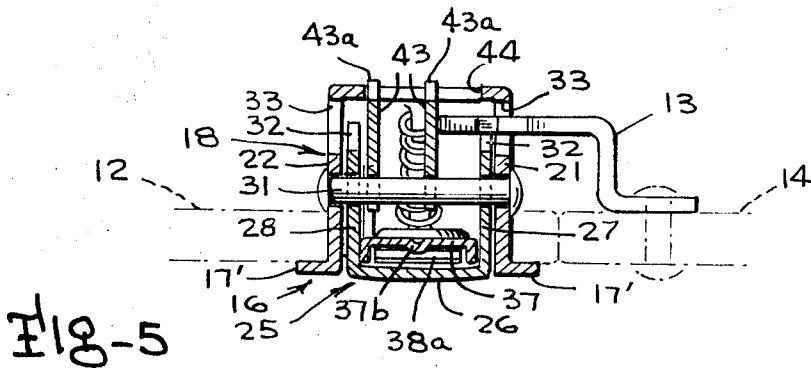
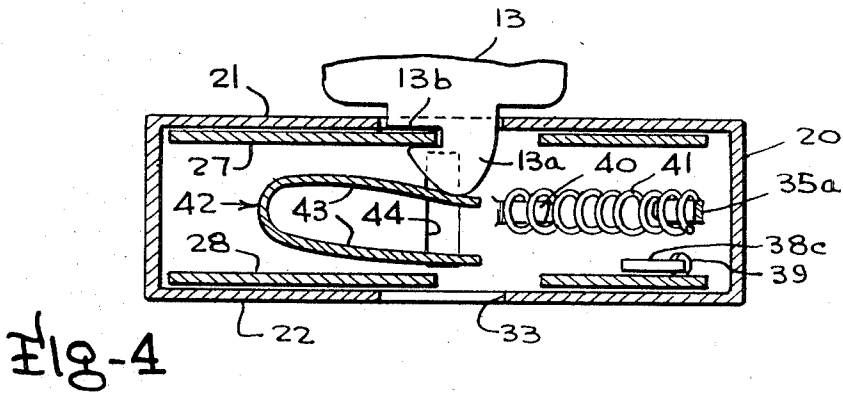
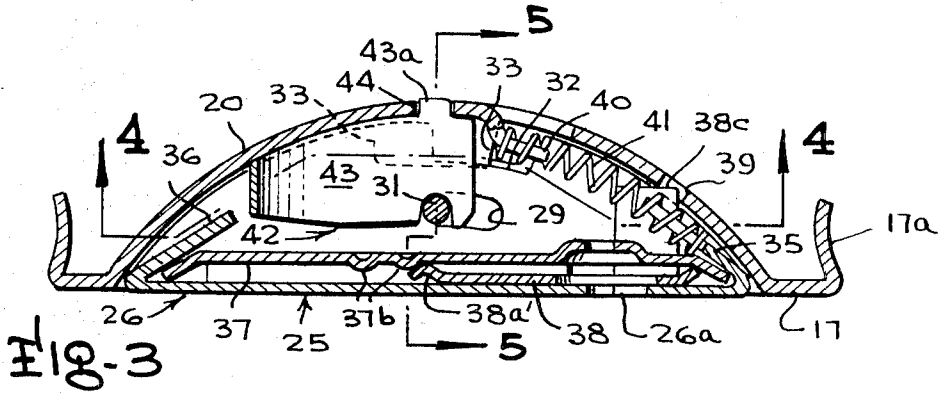




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LATCH STRUCTURE

BACKGROUND AND OBJECTS OF THE INVENTION

The present invention relates to a latch structure for luggage cases and other containers having a cover section hinged to a body section, wherein the latch mechanism, which includes key-locking components, is housed in a well member to normally lie substantially flush with the adjacent surface of the luggage or a surface of a luggage valance or the like and is movable along an arcuate path about an axis parallel to the surface to release a keeper.

Heretofore, it has been the usual practice in the design and construction of latch 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 closed relationship. Frequently, a movable fingerpiece of some sort has been provided in such prior devices to permit the operator to overcome the spring bias and release the latch, the fingerpiece usually being a projection or extension from the lock body or casing disrupting the continuity and artistic appearance of the casing.

I have previously disclosed in U.S. Pat. No. 3,266,275, a latch mechanism located in a well member housed in the body section of a luggage case to normally lie flush with the surface of the luggage and which is movable along an arcuate path to release a keeper mounted on the cover section. The latch construction of the present invention represents an improvement over the construction disclosed in my earlier, above-mentioned patent, as it is of simpler construction, requiring less parts and thus is more economically manufactured, and incorporates a novel spring mechanism for resiliently ejecting the keeper when the latch mechanism is manually shifted through its arcuate path to release the keeper from latched position.

An object of the present invention, therefore, is the provision of a latch structure having a key-locking mechanism incorporated therein, 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 latch structure having latch and lock components housed in a movable member in a concave well to normally lie substantially flush with the adjacent surface of the associated container or luggage or with an outwardly facing surface of a valance strip or the like, the structure being movable along an arcuate path for releasing the latch components, and wherein spring means are incorporated to automatically eject the keeper upon release of the same from latched condition.

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

BRIEF DESCRIPTION OF THE FIGURES

FIG. 1 is a perspective view of a latch mechanism constructed in accordance with the present invention and shown in position on a portion of a luggage receptacle indicated in broken lines;

FIG. 2 is an exploded perspective view of the latch mechanism;

FIG. 3 is a horizontal longitudinal sectional view, taken along the line 3-3 of FIG. 1, illustrating the parts in locked condition;

FIG. 4 is a vertical longitudinal sectional view, taken along the line 4-4 of FIG. 3; and

FIG. 5 is a vertical transverse sectional view taken along the line 5-5 of FIG. 3.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Referring to the drawings, wherein like reference characters designate corresponding parts throughout the several figures, the latch 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 a 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 a receptacle body and cover, indicated by reference character 15.

The latch section 11 comprises a housing member 16 having a front panel portion 17 of laterally or horizontally elongated, generally rectangular, configuration, and a rearwardly projecting well portion 18 defining a forwardly opening well 19 in the configuration of a segment of a cylinder concentric with a vertical axis located forwardly of the front panel portion 17 and substantially centered between the opposite lateral ends or vertical edges of the panel portion 17. The well 19 is bounded by an arcuate concave inner wall 20, and top and bottom walls 21, 22 of circular segment configuration preferably integral with the front panel portion 17 and concave inner wall 20. The marginal portions of the front panel portion on all sides thereof extend beyond the extremities of the well portion 18 to define mounting and locating flanges 17' for the housing member 17. The housing member 17 is adapted to be mounted in the body portion 12 of the luggage or container by projecting the well portion 18 through a suitable accommodating opening cut in the front wall of the luggage body 12 until the flanges 17' abut against the front surface of the wall of the luggage section 12 bounding the opening for accommodating the well portion 18, thus disposing the front panel portion 17 substantially flush with the luggage front wall. The housing member 11 is secured in this position by suitable fastening means, which in the preferred form comprises rearwardly projecting mounting lugs 17a, forming bendable ears projecting integrally from the member 11 through the front wall. It will be appreciated that other suitable fastening means may be used, such as mounting screws, rivets or the like.

Disposed within the well 19 of the housing member 16 is a movable latch member 25 of corresponding configuration to the well 19 adapted to be rotated through a small arc therein and displaced laterally through a short distance during such rotation to release the cooperating keeper 13. This movable latch member 25, in the preferred embodiment, is formed of sheet metal and shaped to define an integral front wall 26, of substantially planiform rectangular configuration, with integral circular segmental top and bottom flanges 27, 28, extending rearwardly therefrom along substantially parallel planes and conforming closely to the curvature and configuration of the well 19 in horizontal section to nest therein in the normal latched condition of the latch member 25 with the front wall 26 substantially flush with the panel portion 17 of the housing member 16. The top and bottom flanges 27, 28 are provided with slightly elongated curved slots 29 therein concentric with the axis of rotation of the curved inner wall 20 of the well 19, aligned with the circular apertures 30 in the top and bottom walls 21, 22 to receive a rivet 31 defining the pivot axis of the latch member 25. The top and bottom flanges 27, 28 are each also provided with a keeper aperture 32 in the free, rearmost edge thereof sized in accordance with the maximum width of the hook portion 13a of the keeper to admit movement of the hook portion 13a inwardly and outwardly through the keeper opening 32 and through the substantially corresponding keeper openings 33 in the top and bottom walls 21, 22 of the housing member 16. In the normal latching position of the latch member 25, the keeper openings 32 are offset to the right of the well, as viewed in FIG. 2, from the keeper apertures 33 and are displaced from proper registry with the

hook portion 13a of the keeper so that portions of the top flange 27 or bottom flange 28 adjacent to the keeper interfit in the keeper slot 13b, maintaining the keeper latched in the well 19. Upon arcuate displacement of the latch member 25 from its normal latching position to its unlatching position, these portions of the flanges 27 or 28 are withdrawn from the keeper slot 13b to free the keeper for withdrawal from the well 19.

Also integrally extending from the front wall 26 of the latch member 25 are a pair of inwardly converging, inclined end flanges 35, 36 which are bent inwardly over the opposite ends of the plate member 37, forming a retaining plate for the slide bolt 38 and having a length which is substantially coextensive with the length of the front wall 26 to be retained thereagainst at the opposite ends of the front wall 26 by engagement of the flanges 35, 36 with the forwardly inclined end portions 37a of the plate member 37. The bolt 38 is slidably disposed between the plate member 37 in the front wall member 36, and has a resilient, rearwardly inclined flange portion 38a bearing against the front surface of the plate member 37 and adapted to be resiliently restrained in an unlocking position disposing the rounded nose 38a' near the end of the flange portion 38a between the two detent noses 37b deformed forwardly in the plate member 37. The nose 38a' is located to the left of these detent noses 37b as viewed in FIG. 2, when the bolt 38 occupies a locking position. The bolt 38 has a suitably shaped aperture 38b therein to receive the bit portion of a key for shifting the bolt 38 between locking and unlocking positions upon rotation of the key. The aperture 38b is aligned with a circular key opening 37c in the plate member 37 and an appropriately shaped key opening 26a in the front wall 26 of the latch member 25. The bolt 38 also has a rearwardly extending rectangular lug 38c projecting through a suitable elongated cutout 37d in the lower edge of the plate member 37, as viewed in FIG. 2, to dispose the rearmost corner of the bolt lug 38c adjacent the concave inner wall 20 of the well 19. In the locked position of the bolt 38, as viewed in FIG. 3, a rearmost corner of the bolt lug 38c projects into a locking aperture 39 in the concave inner wall 20 to hold the latch member 25 against arcuate movement from its normal latching position.

Also extending forwardly from the concave inner wall 20 is a spring anchor tongue 40, preferably struck from the material of the inner wall 20, on which is fitted one end of a coil spring 41, the other end of which is fitted over the tongue 35a of the end flange 35. This coil spring 41 resiliently biases the latch member 25 to its normal latching position, in which the latching member is restrained by engagement of an end of the curved slots 29 with the rivet or pivot pin 31.

To effect automatic resilient ejection of the keeper hook 13a from the well 19 when the keeper hook is unlatched, a generally U-shaped spring 42 is disposed within the well 19 between the curved inner wall 20 and the plate member 37 of the latch member 25. This keeper ejection spring 42 has a pair of legs 43 each of which have a rearwardly projecting lug 43a near the free edge thereof extending into a vertically elongated slot 44 in the curved inner wall 20 of the housing member 16. The free end regions of the legs 43 of spring 42 are disposed in the path of the keeper hook portion 13a so that one of the legs 43 is engaged by the lower end of the keeper hook portion 13a and flexed toward its companion leg 43 when the keeper hook is projected fully to latched position. Therefore, when the portion of the upper or lower flanges 27, 28 interfitted in the keeper slot 13b, at the latched position of the keeper, is released from the keeper slot, the return force of the flexed spring leg 43 engaged by the keeper hook portion 13a immediately ejects the keeper hook portion from the keeper openings 32, 33 and partially opens the luggage cover to which the keeper is attached.

It will be understood that because of the construction hereinabove described, the latch section 16 may be installed either in the position illustrated in FIGS. 1 and 2 or in a reverse position relative thereto, thus permitting the mechanism to be used for either right or left ends of luggage

cases with complete interchangeability. Assuming the structure to be installed as illustrated in FIGS. 1 and 2, it will be apparent that upon closing of the luggage cover 14, the keeper hook portion 13a will be projected downwardly through the keeper aperture 33 in the top wall 21 and through the keeper opening 32 in the top flange 27, the shape of the keeper hook portion 13a between the lowermost end thereof and the slot 13b effecting camming of the latch member 25 through its designed arcuate stroke for aligning the keeper opening 32 to admit passage of the keeper into the mechanism, whereupon spring return of the latch member 25 to its normal position, when the keeper slot 32 is registered horizontally with the flange 27, will effect insertion of a portion of the flange 27 into the slot 13b to latch the keeper. Upon turning of the key inserted in the key aperture 38b in the bolt in the appropriate direction, the bolt 38 will be thrown to project a corner of the bolt lug 38c into the opening 39 to lock the latch member 25 against displacement from its latching position. Reverse movement of the key shifts the bolt 38 to a position disposing the nose portion of its resilient inclined flange 38a between the detents 37b and withdrawing the corner of the bolt tongue 38c from the aperture 39. Then, finger pressure on the right-hand end portion of the front wall of latch member 25 in the zone of the key opening 26a will cause arcuate movement of the latch member 25 through an appropriate stroke to withdraw the flange 27 from interfitting relation in the keeper slot 13b, and the elastic memory or spring return force of the downwardly flexed upper leg 43 of the spring 42 will immediately eject the keeper hook portion 13a from the keeper openings 32 and 33 upon such release of the keeper.

I claim:

1. A latch adapted to be mounted on a pair of separable companion sections of a container, the sections respectively having substantially coplanar first and second front surfaces adjacent a line of separation therebetween, comprising a keeper to be affixed to the first front surface having a hooklike portion defining a laterally opening slot paralleling said line of separation and a free edge having a convex portion forming a camming surface spaced from the slot toward the other of said sections, a latching unit on the second front surface including a housing member defining a well of substantially circular segment configuration concentric with an axis spaced outwardly from said second surface and opening outwardly thereof, a movable latch member of substantially corresponding configuration to said well nested therein having at least one thin circular segment flange extending perpendicular to the plane of said second surface, means supporting said latch member for circumferential displacement along an arcuate path about said axis from a normal latching position nested in registering relation in said well to a release position displaced circumferentially from said latching position in a first direction and for return movement in an opposite direction to the latching position, spring means continuously urging said latch member in said second direction to said latching position, said housing member and said flange having keeper receiving openings therein to receive a portion of said keeper in said latch member when said separable container sections are in a closed position, said flange including portions bounding the keeper receiving opening therein movable into and out of said slot upon such circumferential displacement of said latch member for latching the keeper portion therein against withdrawal therefrom and for freeing the keeper portion for withdrawal, said bounding portions being engaged by said camming surface of said keeper during insertion movement of the latter into said slot to cam the latch member toward said release position to admit registry of said slot with said flange whereupon the latch member is returned by said spring means to said latching position, and a spring in said housing member having a flexible leg in the path of movement of said keeper portion to be engaged and flexed to a stressed condition by said free edge when the keeper portion reaches latched condition and for resiliently propelling the keeper portion outwardly through said openings when the keeper portion is released by said flange.

2. A latch adapted to be mounted on a pair of separable companion sections of a container, the sections respectively having substantially coplanar first and second front surfaces adjacent a line of separation therebetween, comprising a keeper to be affixed to the first front surface having a hooklike portion defining a laterally opening slot paralleling said line of separation and a free edge spaced therefrom toward the other of said sections, a latching unit on the second front surface including a housing member defining a well of substantially circular segment configuration concentric with an axis spaced outwardly from said second surface and opening outwardly thereof, a movable latch member of substantially corresponding configuration to said well nested therein having at least one thin circular segment flange extending perpendicular to the plane of said second surface, means supporting said latch member for circumferential displacement along an arcuate path about said axis from a normal latching position nested in registering relation in said well to a release position displaced circumferentially from said latching position in one direction, said housing member and said flange having keeper receiving openings therein to receive a portion of said keeper in said latch member when said separable container sections are in a closed position, said flange including portions bounding the keeper receiving opening therein movable into and out of said slot upon such circumferential displacement of said latch member for latching the keeper portion therein against withdrawal therefrom and for freeing the keeper portion for withdrawal, and a spring in said housing member having a flexible leg in the path of movement of said keeper portion to be engaged and flexed to a stressed condition by said free edge when the keeper portion reaches latched condition and for resiliently propelling the keeper portion outwardly through said openings when the keeper portion is released by said flange, said housing member having a concave cylindrical rear wall and top and bottom circular segment walls bounding said well, said latch member having a thin elongated front wall substantially closing said well at the plane of said second surface and having a pair of spaced parallel top and bottom thin circular segment flanges extending perpendicularly therefrom along the longitudinal edges thereof, said top and bottom walls and said top and bottom flanges having said keeper receiving openings therein, and said spring being a U-shaped spring having similar upper and lower legs respectively inwardly adjacent said top and bottom flanges whereby the upper and lower of said legs may be engaged and flexed by said free edge upon insertion of said keeper portion through said apertures in said top and bottom walls, respectively.

3. A latch adapted to be mounted on a pair of separable companion sections of a container, the sections respectively having substantially coplanar first and second front surfaces adjacent a line of separation therebetween, comprising a keeper to be affixed to the first front surface having a hooklike portion defining a laterally opening slot paralleling said line of separation and a free edge spaced therefrom toward the other of said sections, a latching unit on the second front surface including a housing member defining a well of substantially circular segment configuration concentric with an axis spaced outwardly from said second surface and opening outwardly thereof, a movable latch member of substantially corresponding configuration to said well nested therein having at least one thin circular segment flange extending perpendicular to the plane of said second surface, means supporting said latch member for circumferential displacement along an arcuate path about said axis from a normal latching position nested in registering relation in said well to a release position displaced circumferentially from said latching position in one direction, said housing member and said flange having keeper receiving openings therein to receive a portion of said keeper in said latch member when said separable container sections are in a closed position, said flange including portions bounding the keeper receiving opening therein movable into and out of said slot upon such circumferential displacement of said latch member for latching the keeper portion therein against withdrawal therefrom and for freeing the keeper portion for

withdrawal, and a spring in said housing member having a flexible leg in the path of movement of said keeper portion to be engaged and flexed to a stressed condition by said free edge when the keeper portion reaches latched and for resiliently propelling the keeper portion outwardly through said openings when the keeper portion is released by said flange, said housing member having a concave cylindrical rear wall and top and bottom circular segment walls bounding said well, said latch member having a thin elongated front wall substantially closing said well at the plane of said second surface and having a pair of spaced parallel top and bottom thin circular segment flanges extending perpendicularly therefrom along the longitudinal edges thereof, said top and bottom walls and said top and bottom flanges having said keeper receiving openings therein, and said spring being a U-shaped spring having similar upper and lower legs respectively inwardly adjacent said top and bottom flanges whereby the upper and lower of said legs may be engaged and flexed by said free edge upon insertion of said keeper portion through said apertures in said top and bottom walls, respectively, said concave cylindrical rear wall having an elongated slot therein paralleling said axis and said legs of said spring each have a lug projecting therefrom adjacent their free edges and into said slot for sliding movement therein and to retain said spring in preselected position within said well, and the bounding edges of said slots at the ends thereof providing limit surfaces to engage and restrain said spring in predetermined stressed condition locating said legs in selected spaced relation inwardly of said flanges to be engaged and flexed inwardly of said free edge during movement of said keeper to latching position.

4. A latch adapted to be mounted on a pair of separable companion sections of a container, the sections respectively having substantially coplanar first and second front surfaces adjacent a line of separation therebetween, comprising a keeper to be affixed to the first front surface having a hooklike portion defining a laterally opening slot paralleling said line of separation and a free edge spaced therefrom toward the other of said sections, a latching unit on the second front surface including a housing member defining a well of substantially circular segment configuration concentric with an axis spaced outwardly from said second surface and opening outwardly thereof, a movable latch member of substantially corresponding configuration to said well nested therein having at least one thin circular segment flange extending perpendicular to the plane of said second surface, means supporting said latch member for circumferential displacement along an arcuate path about said axis from a normal latching position nested in registering relation in said well to a release position displaced circumferentially from said latching position in one direction, said housing member and said flange having keeper receiving openings therein to receive a portion of said keeper in said latch member when said separable container sections are in a closed position, said flange including portions bounding the keeper receiving opening therein movable into and out of said slot upon such circumferential displacement of said latch member for latching the keeper portion therein against withdrawal therefrom and for freeing the keeper portion for withdrawal, and a spring in said housing member having a flexible leg in the path of movement of said keeper portion to be engaged and flexed to a stressed condition by said free edge when the keeper portion reaches latched condition and for resiliently propelling the keeper portion outwardly through said openings when the keeper portion is released by said flange, said housing member including a concave cylindrical rear wall having an elongated slot therein paralleling said axis and said spring being of substantially U-shaped configuration defining two legs, one of which has a lug projecting therefrom adjacent their free edges and into said slot for sliding movement therein and to retain said spring in preselected position within said well, and the bounding edges of said slot at the ends thereof providing limit surfaces to engage and restrain said spring in predetermined stressed condition locating one of said legs in selected spaced relation inwardly of said flange

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to be engaged and flexed inwardly by said free edge during movement of said keeper to latching position.

5. In a latch as defined in claim 3, said latch member including a key lock having a bolt movable by a key between a projected and retracted position within said well, and said housing member including a stop surface located adjacent said bolt when the latter is in projected position and said latch member occupies said latching position to bar movement of said latch member to said release position.

6. In a latch as defined in claim 4, said latch member including a key lock having a bolt movable by a key between a projected and retracted position within said well, and said housing member including a stop surface located adjacent said bolt when the latter is in the projected position and said latch member occupies said latching position to bar movement of said latch member to said release position.

7. In a latch as defined in claim 2, said latch member having integral end flanges bent rearwardly and inwardly in convergent relation from opposite ends of said front wall, a retaining plate substantially coextensive with said front wall spaced rearwardly therefrom and retained by said end flange rearwardly lapping the same, and a bolt plate slidably supported between said front wall and retaining plate for rectilinear reciprocative movement between locking and unlocking positions responsive to movement of a key, said bolt plate having a locking lug projecting integrally rearwardly therefrom beyond said retaining plate, and said concave cylindrical wall having shoulder means engageable with said locking lug at the locking position of said bolt plate to hold said latch member against circumferential movement from latching position.

8. In a latch as defined in claim 3, said latch member having integral end flanges bent rearwardly and inwardly in convergent relation from opposite ends of said front wall, a retaining plate substantially coextensive with said front wall spaced rearwardly therefrom and retained by said end flange rearwardly lapping the same, and a bolt plate slidably supported between said front wall and retaining plate for rectilinear reciprocative movement between locking and unlocking positions responsive to movement of a key, said bolt plate having a locking lug projecting integrally rearwardly therefrom beyond said retaining plate, and said concave cylindrical wall having shoulder means engageable with said locking lug at the

locking position of said bolt plate to hold said latch member against circumferential movement from latching position.

9. In a latch as defined in claim 1, said latch member having a front wall and integral end flanges bent rearwardly and inwardly in convergent relation from opposite ends of said front wall, a retaining plate substantially coextensive with said front wall spaced rearwardly therefrom and retained by said end flange rearwardly lapping the same, and a bolt plate slidably supported between said front wall and retaining plate for rectilinear reciprocative movement between locking and unlocking positions responsive to movement of a key, said bolt plate having a locking lug projecting integrally rearwardly therefrom beyond said retaining plate, and said concave cylindrical wall having shoulder means engageable with said locking lug at the locking position of said bolt plate to hold said latch member against circumferential movement from latching position.

10. In a latch as defined in claim 4, said latch member having a front wall and integral end flanges bent rearwardly and inwardly in convergent relation from opposite ends of said front wall, a retaining plate substantially coextensive with said front wall spaced rearwardly therefrom and retained by said end flange rearwardly lapping the same, and a bolt plate slidably supported between said front wall and retaining plate for rectilinear reciprocative movement between locking and unlocking positions responsive to movement of a key, said bolt plate having a locking lug projecting integrally rearwardly therefrom beyond said retaining plate, and said concave cylindrical wall having shoulder means engageable with said locking lug at the locking position of said bolt plate to hold said latch member against circumferential movement from latching position.

11. A latch as defined in claim 4, including a rivet member fixed in said housing member in parallelism with said axis, said flange having an arcuate slot accommodating said rivet member to permit said circumferential displacement of the latch member, and said legs of said spring having concave recesses facing in a direction away from said rear wall and conforming substantially to the diameter of said pivot member to receive said pivot member therein and be restrained thereby at a position maintaining said lug in said slot in the rear wall.

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