

March 15, 1955

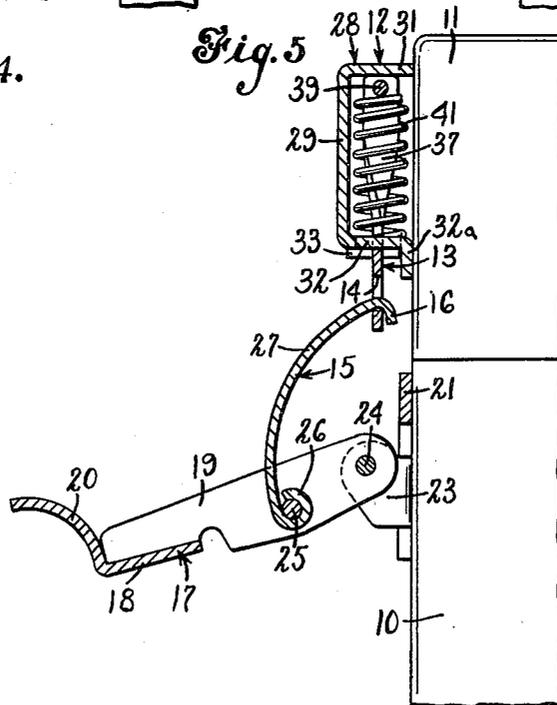
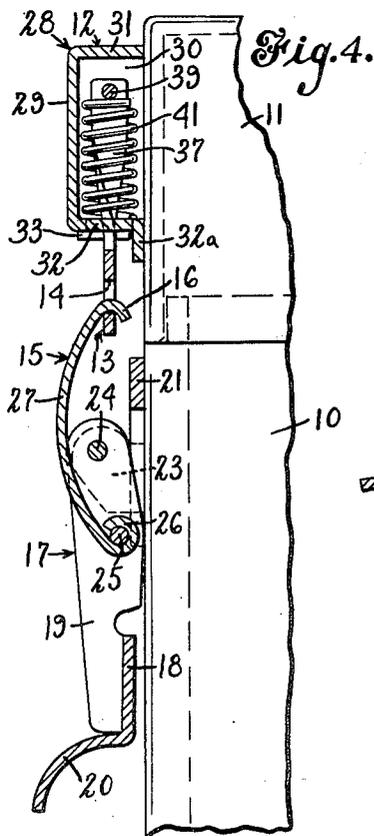
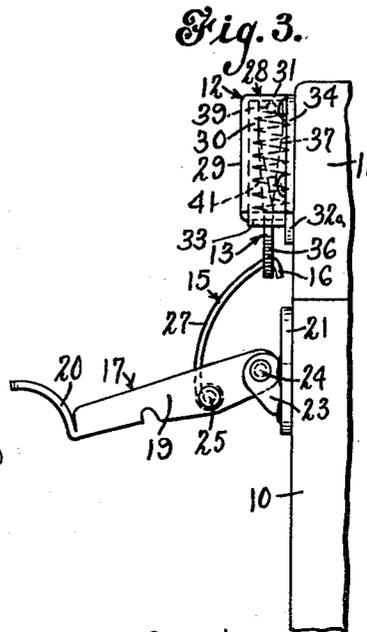
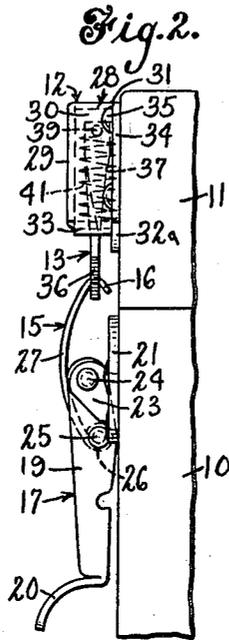
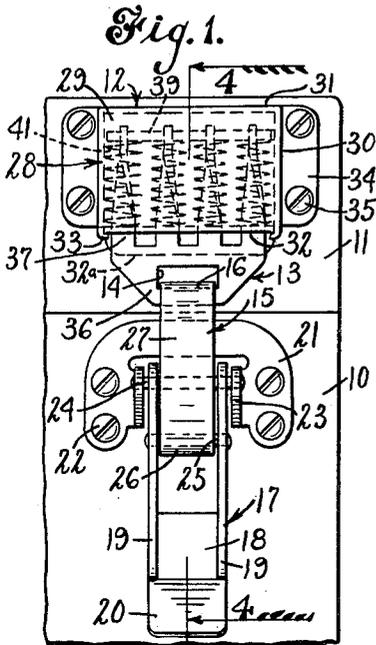
A. CLAUD-MANTLE

2,704,218

LID FASTENER

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2 Sheets-Sheet 1



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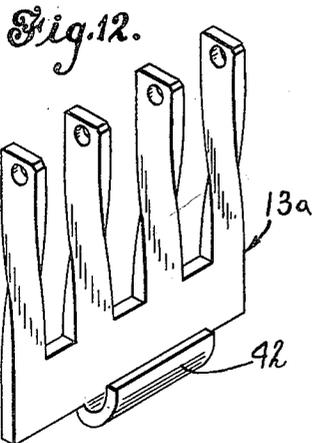
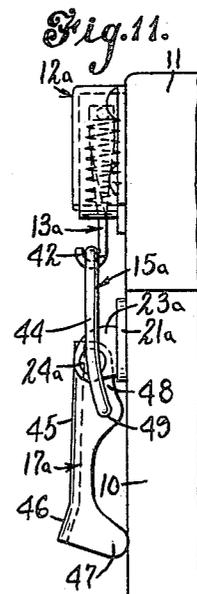
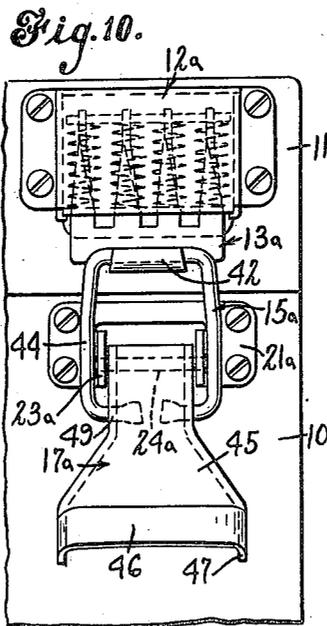
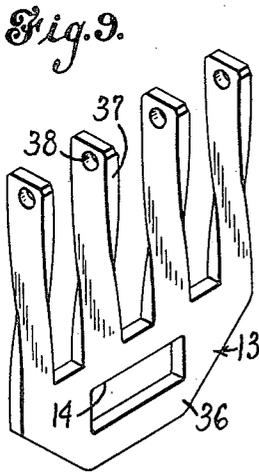
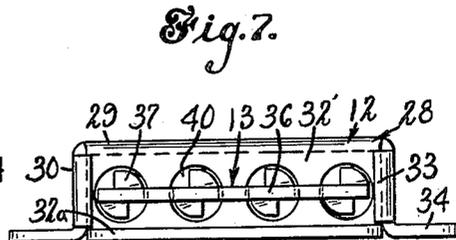
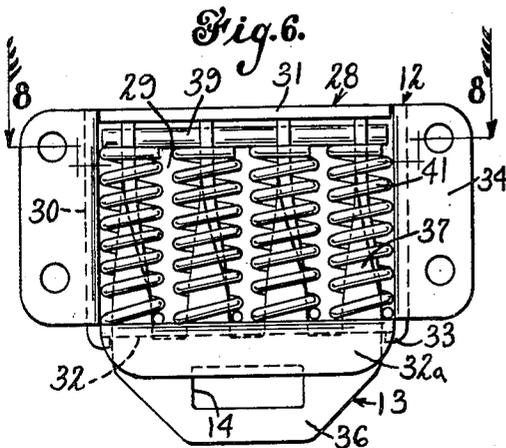
A. CLAUD-MANTLE

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2 Sheets-Sheet 2



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LID FASTENER

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Application February 5, 1952, Serial No. 270,057

5 Claims. (Cl. 292—113)

This invention relates to lid fasteners of the kind employed for fastening the lids of boxes and similar containers, and relates to the type in which one member is secured to the lid of a box and another member is secured to the box body. It relates more particularly to a fastener comprising a lid-attached retainer having a spring-pressed latching member, and a box-attached toggle member adapted to cooperate with the spring-pressed latching member to fasten the box lid.

One of the objects of the invention is to provide an improved lid-attached retainer.

Another object is to provide a lid-attached retainer having a spring-pressed latching member.

Another object is to provide a lid-attached retainer having a latching member downwardly displaceable against spring pressure to permit a gasket or packing member to be disposed between the box body and the box lid to provide an air-tight and water-tight connection between the aforementioned box parts.

Another object is to provide an improved toggle member in a fastener of this general character.

Still another object is to provide a durable fastener comprised of few and simple parts produced at low cost.

In the accompanying drawings:

Fig. 1 is a front elevation showing a box equipped with a fastener embodying my improvements, with parts of the box being broken away, and showing the fastener in latched position;

Fig. 2 is a side elevation showing the fastener in latched position;

Fig. 3 is an elevation similar to Fig. 2, but showing the fastener in another and intermediate position;

Fig. 4 is a sectional view taken on line 4—4 of Fig. 1 and showing the fastener in latched position;

Fig. 5 is a sectional view similar to Fig. 4 but showing the fastener in the position shown in Fig. 3;

Fig. 6 is a rear elevation of the retainer adapted to be attached to a box lid;

Fig. 7 is a bottom view of the retainer shown in Fig. 6;

Fig. 8 is a sectional view taken on line 8—8 of Fig. 6;

Fig. 9 is a perspective view of the latching member shown in Fig. 6;

Fig. 10 is a front elevation of a modified form of my invention showing a box-attached fastener in latched position;

Fig. 11 is a side elevation of the fastener shown in Fig. 10, showing the fastener in latched position; and

Fig. 12 is a perspective view of the latching member shown in Fig. 10.

In the drawings, each form of my invention selected for illustration comprises a retainer adapted to be secured to the lid of a box, and an over-center toggle adapted to be secured to a box body. The retainer comprises a spring-urged latching member cooperating with the toggle to exert a resilient downward pull on the box lid. The toggle, in turn, comprises a catch member cooperating with the latching member of the lid-attached retainer, and also comprises an operating or manipulating lever. In the form of the invention shown in Figs. 1 through 9, the catch member comprises a leaf spring having a hook formed at the upper end thereof engageable with the latching member of the lid-attached retainer through a slot formed therein. In the form of the invention shown in Figs. 10 through 12, the catch member comprises a wire bail engageable with a lip formed on the lower portion of the latching member of the lid-attached retainer.

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In Figs. 1 through 9, the box body is indicated at 10, the lid at 11, the retainer applied to the lid at 12, the latching member carried by the retainer at 13, the slot in the latching member at 14, the catch member comprising a leaf spring at 15, the hook at the upper end of the leaf spring at 16, and the operating lever at 17.

The operating lever 17 of the toggle is constructed of sheet metal and has a substantially planar surface 18 and side flanges providing spaced parallel walls 19 extending outwardly and upwardly to form a bifurcated structure. The lower end of the operating lever 17 is arcuately bent to provide a finger grip portion 20.

The operating lever 17 is supported from an attaching plate 21 adapted to abut the box body 10 and provided with perforations to receive box-attaching screws or bolts 22. The attaching plate 21, constructed of sheet metal, is generally of inverted U shape and is provided with a pair of outwardly directed perforated ears 23 straddling the upper ends of the side walls 19 of the operating lever. The upper ends of the walls 19 of the operating lever are perforated to receive a pivot pin 24 extending between and carried by the ears 23 and pivoting the operating lever to the attaching plate.

Intermediate the ends of the operating lever 17, the lever 17 is provided with an over-center pivot comprising a pin 25 extending between and carried by the walls 19 adjacent their inner edges. The leaf-spring catch member 15 is constructed of sheet metal and has its lower end 26 bent over the pivot pin 25 so as to be pivotally connected to the operating lever 17. The hook 16 is provided at the other end of the catch member 15, and the intermediate portion 27 of the catch member is bowed outwardly.

The retainer 12 comprises a bracket or casing 28, formed of sheet metal, having a planar forward face portion 29, and having rearwardly directed flanges comprising side walls 30, a top wall 31 and a bottom wall 32. The bottom wall is provided with an inner depending projection 32^a to abut the box lid. Each of the side walls 30 is provided with a lug 33 at the lower extremity thereof underlying the bottom wall 32 to prevent downward displacement of the latter, and each of the side walls 30 is provided with an ear 34 adapted to abut the box lid, each ear 34 being perforated to receive lid-attaching screws or bolts 35.

The bracket 28 provides a support for the depending latching member 13 in a manner to be explained hereinafter. The latching member 13, constructed of sheet metal, is provided with a wedge-shaped lower portion 36 slotted at 14 to receive the hook 16 of the catch member 15. The latching member 13 is provided with a plurality of fingers 37, four being preferred, extending upwardly from the wedge-shaped lower portion 36. Each of the fingers 37 is preferably twisted 90° on its longitudinal axis. The fingers 37 are provided with horizontally aligned holes 38 to receive a spring-retaining pin 39, the function of the latter appearing hereinafter. The fingers 37 are received within the bracket 28 through circular holes 40 in the bottom wall 32, and the distal ends of the fingers are engageable with the under surface of the top wall 31. A helical spring 41 is slipped over each of the fingers 37 to engage the upper surface of the bottom wall 32, and the spring-retaining pin 39 is inserted in the holes 38 in the fingers 37 over and across the upper ends of the springs 41. The springs 41 are under compression when the outer ends of the fingers 37 are engaged by the top wall 31 of the bracket acting as an upper stop for the latching member. In the assembled retainer, the arrangement is such that the springs 41 are constantly under compression between the bottom wall 32 of the bracket 28 and the spring-retaining pin 39, the springs 41 constantly exerting a resilient upward pressure upon the slidable latching member 13.

To fasten the lid of the box, the toggle is swung upwardly toward the retainer and the hook 16 of the catch member 15 inserted in the slot 14 of the latching member or slide 13 to engage the latter, the fastener then being in an intermediate position, shown in Fig. 3, for example. To move the fastener from the position shown in Fig. 3 to the fully closed or latched position, shown in Fig. 2, for example, the operating lever 17 is swung downwardly,

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moving the latching member 13 downwardly against the pressure of springs 41 until the lower pivot 25 carried by the operating lever 17 and pivoting the lower end of the catch member 15 passes dead center, at which point the pivot 25 is urged upwardly and inwardly toward the box by the springs 41, which are then strongly compressed, and the fastener is closed and assumes the position shown in Fig. 2. In the last-mentioned position, the action of springs 41 is such that outward swinging movement of the operating lever 17 is strongly resisted, the springs 41 effectively preventing accidental dislocation of the toggle. In the closed position, the fastener exerts a strong downward pull on the box lid through the catch member 15, the latching member 13, the springs 41, and the bottom wall 32 of the bracket 28.

With particular reference to the retainer 12 and parts thereof, it is to be noted that, as the toggle is moved from the intermediate position shown in Fig. 3 to the closed position shown in Fig. 2, the catch member 15 displaces the latching member 13 with respect to the box lid and the bracket 28, the latching member moving downwardly against increasing compression of the springs 41 interposed between the pin 39 carried by the latching member and the bottom wall 32 of the bracket 28. Normally, in the closed position of the fastener, the springs 41 are not fully compressed; however, such may be the case and, when this occurs, it will be understood that the coils of the springs 41 and the retaining pin 39 act as stops limiting downward movement of the latching member 13.

As the catch member can conveniently take the form of an outwardly bowed leaf spring as shown, being under tension in the closed position of the fastener, the latter adds to the resiliency of the connection between the toggle and the retainer.

As previously stated, when the fastener is in the closed position, opening movement of the operating lever 17 is resisted by the springs 41 as the springs 41 are further compressed as the operating lever is swung outwardly to the point where the pivot pin 25 at the lower end of the catch member passes dead center, and at this point the springs 41 urge the operating lever 17 upwardly and outwardly from the box and the toggle is moved to the intermediate position shown in Fig. 3.

As the toggle is opened and moved from the position shown in Fig. 2 to that shown in Fig. 3, the hook 16 of the catch member 15 is retained within the slot 14 of the latching member 13 so that the hook 16 will not fly back to possibly strike and injure the hands of the operator. As the toggle is opened, the hook end of the catch member moves upwardly and inwardly through the slot in the latching member, owing in part to the bow shape of the catch member, and when allowed to drop back, re-engages the latching member. When the toggle is in the intermediate position, the catch member is easily disengaged from the latching member by grasping the first member and lifting the hook out of the slot in the second member.

In the modified form of my invention shown in Figs. 10, 11 and 12, the lid-attached retainer 12^a is generally similar to the retainer 12 previously described. The latching member 13^a is not slotted at its lower portion but is provided with a bottom flange forming an unturned bail-engaging lip 42. The catch member 15^a is shown as a wire bail bowed outwardly at 44 and having its ends pivotally connected to an operating lever 17^a. The operating lever 17^a, constructed of sheet metal, is shown in the form of a yoke having a planar outer surface 45 and an outwardly inclined flange 46 at the lower end thereof. A pair of laterally spaced box-engaging projections 47 extend inwardly from the flange 46 of the lever 17^a to limit the swing of the lever 17^a toward the box, and permit access of the operator's fingers between the box and the lever portion 46 to open the toggle. A pair of laterally spaced lugs 48 extend inwardly from the upper portion of the lever 17^a and are pivoted to a box-attaching bracket 21^a, similar to the box-attaching bracket 21 previously described. The lugs 48 are pivoted by a pivot pin 24^a carried by and extending between ears 23^a of the bracket 21^a, the lugs 48 being straddled by the ears 23^a. A distance below and inwardly from the pivot pin 24^a, each of the lugs 48 is pivotally connected as at 49 to one of the ends of the wire bail.

From the foregoing, the operation of the lid fastener

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shown in Figs. 10, 11 and 12 will be evident, and it will be understood that this fastener functions in substantially the same manner as the fastener shown in Figs. 1 through 9 and previously described.

In each of the preferred forms of my invention described herein there is provided a retainer having great strength. The bracket is strongly supported from the box lid owing to the manner in which flanges of the bracket abut the lid and are secured thereto. The bracket has a narrow profile so that it extends outwardly from the lid a short distance only. It is also to be noted that the bracket affords the latching member and associated springs a large measure of protection owing to the wall structure of the bracket, which is imperforate with the exception of the bottom wall thereof. As previously mentioned, the bottom wall of the bracket is strongly supported from beneath by the aforementioned lugs at the lower extremities of the side walls of the bracket.

The springs associated with the latching member of the retainer are sufficiently heavy to exert a strong pressure on the bottom wall of the bracket when the retainer is inoperative, the fingers of the latching member being in strong engagement with the top wall of the bracket. It will be understood that, when the retainer is operative to fasten the lid of the box, the springs associated with the latching member are further compressed and exert a stronger pressure upon the member and the bottom wall of the bracket. In this connection, it is to be noted that the fingers of the latching member have great strength owing to the fact that they are twisted on their longitudinal axes.

A distinct advantage of my improved lid fastener is owed to the fact that the spring-urged latching member has a substantially rectilinear movement and is carried by a part in fixed relationship to one of the box parts, such provision facilitating closing of the fastener against strong spring pressure. It is also to be noted that, with this provision, a lost motion and consequently loose connection between the catch member and the operating lever is not required.

Another advantage of my improved lid fastener is attributable to the fact that the latching member is displaceable downwardly against a considerable degree of spring pressure, permitting a gasket or packing member to be disposed between the box body and the box lid to provide an air-tight and water-tight connection between the aforementioned box parts.

My improved lid fastener is comprised of few and simple parts having great durability, and can be produced at low cost.

The illustrated constructions are by way of example only, and various changes in the organization of parts and in details may be made without departure from the principles of the invention or the scope of the claims.

What I claim is:

1. In a device for fastening a lid to a box body and having a toggle adapted to be secured to the box body and including an upper fastening lever, a retaining device engageable with the fastening lever of the toggle to exert a resilient downward pull on the box lid comprising a shallow rectangular casing provided with attaching flange means adapted to be secured to the box lid, the casing having a wall structure including a front wall, two side walls, a top wall and a bottom wall, a slidable latching sheet metal member extending into said casing through said bottom wall and vertically displaceable with respect to the casing, said top wall of the casing providing an abutment engageable with the latching member to limit upward movement of said member, the latching member having a horizontally extending part at the upper portion thereof, and spring means in the casing urging said member upwardly and comprising at least three laterally spaced coil springs, said latching member having means at the upper portion thereof comprising a plurality of elements, one of which extends into each spring to inhibit lateral dislocation thereof, each spring having one end thereof engaging said bottom wall of the casing and having the other end thereof engaging said part of the latching member, said springs being compressed between said part and said bottom wall, the portion of said latching member below said bottom wall of the casing being provided with means engageable with the fastening lever of the toggle to exert a resilient downward pull on the box lid.

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2. In a device for fastening a lid to a box body and having a toggle adapted to be secured to the box body and including an upper fastening lever, a retaining device engageable with the fastening lever of the toggle to exert a resilient downward pull on the box lid comprising a shallow rectangular casing provided with attaching flange means adapted to be secured to the box lid above said lever, said casing having a wall structure including a front wall, two side walls, a top wall and a bottom wall, a slidable latching member formed of sheet metal for support by said casing and vertically displaceable with respect thereto, said member having a horizontally extending lower portion, and having at least three fingers extending upwardly from said lower portion, said fingers extending upwardly through perforations formed in said bottom wall, said bottom wall of the casing being provided with one perforation for each finger, the top wall of the casing providing an abutment engageable with the distal ends of said fingers to limit upward movement of the latching member, coil springs in the casing urging said member upwardly, one spring being disposed over each of said fingers and having the lower end thereof engaging said bottom wall, said fingers being twisted 90° on their longitudinal axes, and a horizontally disposed spring-retaining pin extending through the upper end portions of said fingers and engaging the other ends of said springs, the springs being compressed between said pin and said bottom wall, said lower portion of the latching member being provided with means engageable with the fastening lever of the toggle to exert a resilient downward pull on the box lid.

3. In a device for fastening a lid to a box body and having a toggle adapted to be secured to the box body and including an upper fastening lever, a retaining device engageable with the fastening lever of the toggle to exert a resilient downward pull on the box lid comprising a shallow rectangular casing provided with attaching flange means adapted to be secured to the box lid above said lever, said casing having a wall structure including a front wall, two side walls, a top wall and a bottom wall, a slidable latching member formed of sheet metal for support by said casing and vertically displaceable with respect thereto, said member having a horizontally extending lower portion, and having at least three fingers extending upwardly from said lower portion, said fingers extending upwardly through perforations formed in said bottom wall, said bottom wall of the casing being provided with one perforation for each finger, the top wall of the casing providing an abutment engageable with the distal ends of said fingers to limit upward movement of the latching member, coil springs in the casing urging said member upwardly, one spring being disposed over each of said fingers and having the lower end thereof engaging said bottom wall, said fingers being twisted 90° on their longitudinal axes, and a horizontally disposed spring-retaining pin extending through the upper end portions of said fingers and engaging the other ends of said springs, the springs being compressed between said pin and said bottom wall, said lower portion of the latching member being provided with slot-defining means engageable with the fastening lever of the toggle to exert a resilient downward pull on the box lid.

4. In a device for fastening a lid to a box body and having a toggle adapted to be secured to the box body and including an upper fastening lever, a retaining de-

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vice engageable with the fastening lever of the toggle to exert a resilient downward pull on the box lid comprising a shallow rectangular casing provided with attaching flange means adapted to be secured to the box lid above said lever, said casing having a wall structure including a front wall, two side walls, a top wall and a bottom wall, a slidable latching member formed of sheet metal for support by said casing and vertically displaceable with respect thereto, said member having a horizontally extending lower portion, and having at least three fingers extending upwardly from said lower portion, said fingers extending upwardly through perforations formed in said bottom wall, said bottom wall of the casing being provided with one perforation for each finger, the top wall of the casing providing an abutment engageable with the distal ends of said fingers to limit upward movement of the latching member, coil springs in the casing urging said member upwardly, one spring being disposed over each of said fingers and having the lower end thereof engaging said bottom wall, said fingers being twisted 90° on their longitudinal axes, and a horizontally disposed spring-retaining pin extending through the upper end portions of said fingers and engaging the other ends of said springs, the springs being compressed between said pin and said bottom wall, said lower portion of the latching member being provided with a lip engageable with the fastening lever of the toggle to exert a resilient downward pull on the box lid.

5. In a device for fastening a lid to a box body and having a toggle adapted to be secured to the box body and including an upper fastening lever, a retaining device engageable with the fastening lever of the toggle to exert a resilient downward pull on the box lid comprising a shallow rectangular casing disposed above said lever for support by the box lid, the casing being formed of sheet metal and having a wall structure including a front wall, two side walls, a top wall and a bottom wall, said side walls being provided with lid-attaching ears and each side wall being provided with an integral part at the lower extremity thereof extending under and adjacent a portion of said bottom wall to support the latter, said bottom wall being provided with an inner depending projection abutting the box lid and providing additional support for said bottom wall, a slidable latching member extending into said casing through said bottom wall and vertically displaceable with respect to the casing, said top wall of the casing providing an abutment engageable with the latching member to limit upward movement of said member, the latching member having a horizontally extending part at the upper portion thereof, and resilient means in the casing disposed between said part of the latching member and said bottom wall of the casing urging the latching member upwardly, the portion of said member below said bottom wall of the casing being provided with means engageable with the fastening lever of the toggle to exert a resilient downward pull on the box lid.

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