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LATCH FOR TOOL BOXES AND THE LIKE

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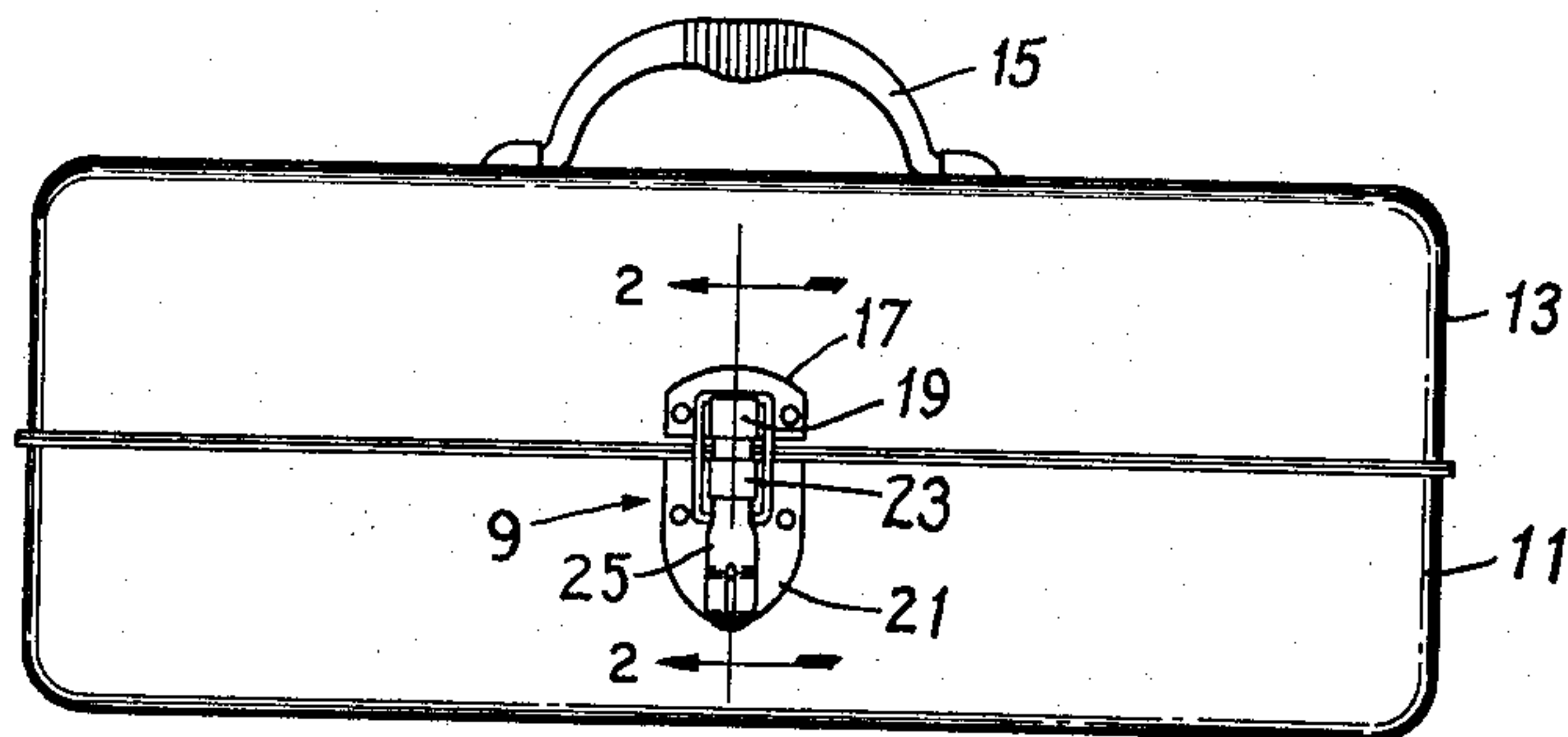


Fig. 1

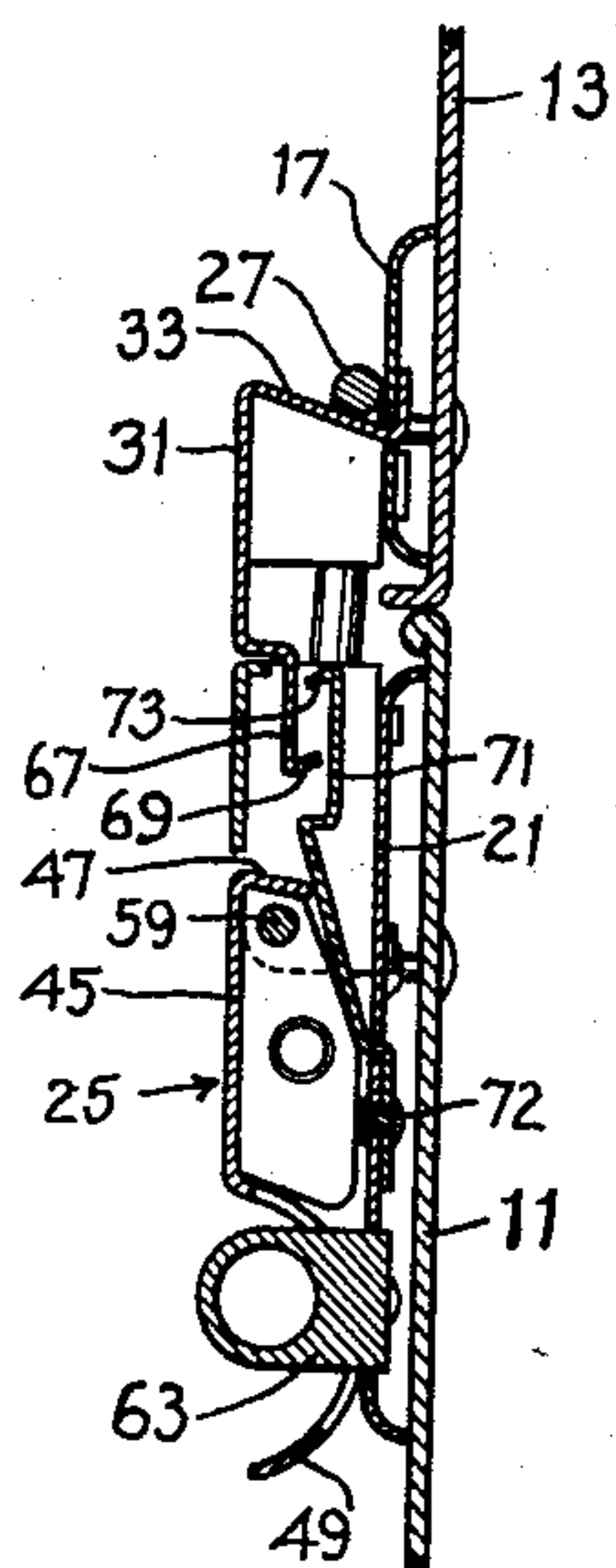


Fig. 2

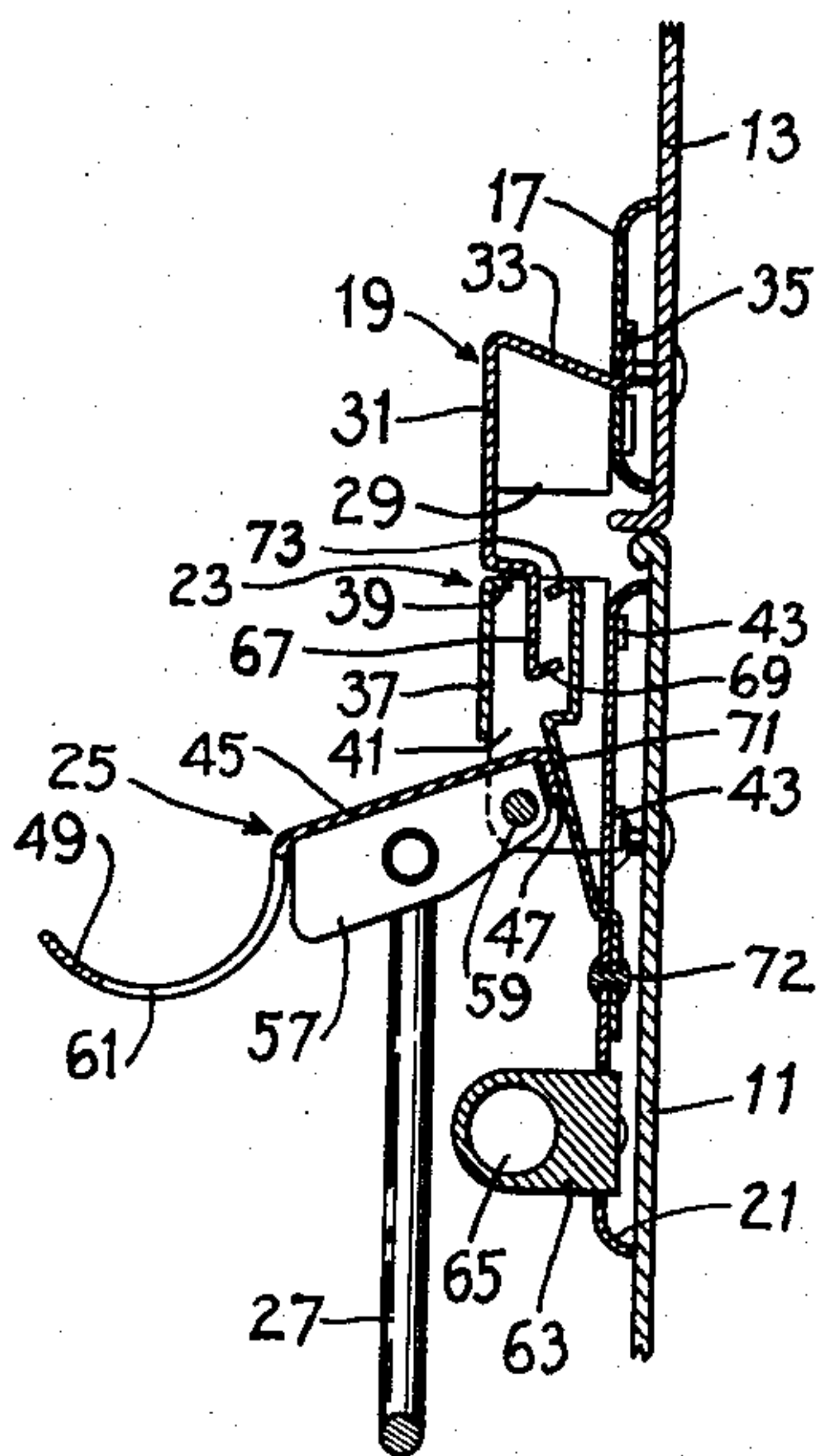


Fig. 3

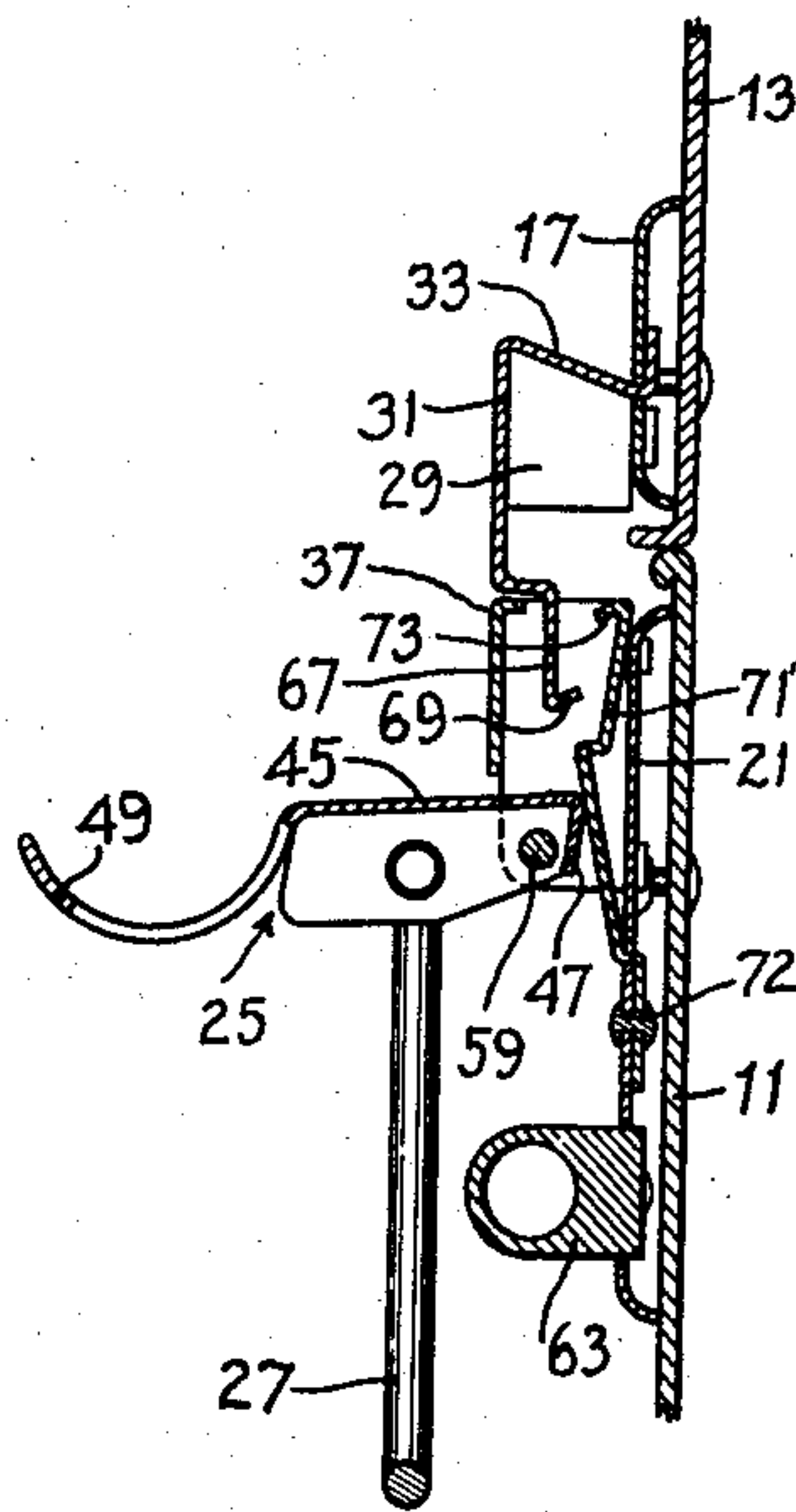


Fig. 4

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LATCH FOR TOOL BOXES AND THE LIKE

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This invention relates to a latch for tool boxes, tackle boxes, and general utility boxes of the kind in which a cover or closure member is hinged to a main portion or body section. Such boxes usually have a handle secured to the top of the cover or closure member, and are customarily carried from place to place by grasping this handle. The entire weight of the box and contents is thus supported by the handle when the box is being carried, the handle being directly attached to the cover member, and the cover member in turn serving to support the main body or bottom section of the box, and its contents, by means of the hinge connecting the cover to the body along one edge, and the latch connecting the cover to the body along the opposite edge.

It frequently happens that when the user has had the box open, to insert or remove articles, the cover may be swung back to a closed position without latching the latch. Then when the box is to be transported to a different location, the user grasps the handle in his hand and lifts it upwardly, forgetting for the moment that the latch is not in its effective latching position. Perhaps the user may be standing on the hinged side of the box, rather than the latch side, and may not see that the latch is not latched. Or even if he is on the latch side of the box, he may be in a hurry and may not particularly notice that the latch is in unlatched or open position. The result is that the upward pull on the handle of the box raises the cover section, and the hinge connection between the cover and one edge of the body raises that edge of the body. But the opposite edge of the body is not raised initially, because of the latch being in unlatched or open position. Therefore the body section of the box tilts to one side and spills out the contents, usually before the person attempting to move the box realizes what has happened.

An object of the invention is the provision of a generally improved and more satisfactory box, which will not accidentally come open in the manner above described.

Another object is the provision of latch mechanism for boxes of the kind mentioned, so designed and constructed that when the cover is moved from an open position to a closed position, it will automatically become latched at least to a sufficient extent to hold the body of the box approximately level when the handle of the cover is grasped and raised, to prevent accidental tilting of the box and spillage of the contents.

Still another object is the provision of a latch mechanism which automatically latches the cover in approximately closed position, but allows the cover to open very slightly, so that the slight opening of the cover relative to the body of the box will serve as a warning indication to the user of the box, when carrying it, that the cover is not properly latched in the normal closed position.

A further object is the provision of latch mechanism of this kind, so designed and constructed that the supplementary or automatic latch may be easily and quickly

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released when it is desired to open the cover of the box.

A still further object is the provision of latch mechanism of the kind mentioned, so designed and constructed that the auxiliary or supplementary latch may be combined with a main or normal latch in an easy manner, with minimum change of manufacturing tools.

These and other desirable objects may be attained in the manner disclosed as an illustrative embodiment of the invention in the following description and in the accompanying drawings forming a part hereof, in which:

Fig. 1 is a front elevational view of a box having a cover which is latched in closed position by a conventional loop latch equipped with an auxiliary latch according to the present invention;

Fig. 2 is a cross section of the latch and a portion of the box and cover shown in Fig. 1 taken approximately on the line 2—2 thereof, the loop or main latch being in its usual latched position;

Fig. 3 is a view similar to Fig. 2 showing the loop latch in open position and the auxiliary latch in position to become engaged should the cover be inadvertently grasped without first latching the main or loop latch as in Fig. 2; and

Fig. 4 is a view similar to Fig. 3 showing the unlatching of the auxiliary latch.

The same reference numerals throughout the same views indicate the same parts.

In Fig. 1 is shown a latch 9 constructed in accordance with the present invention, the latch being illustrated as applied to a utility or tool box or the like having a lower box portion 11 to which is hinged a cover 13. As is usual, the top of the cover 13 has a handle 15 secured to it for carrying the box. Along the rear side of the box (the side opposite to that shown in Fig. 1) the cover section 13 is hinged to the main or body section 11 by the usual hinge. The latch 9 at the front of the box (i.e., the side opposite to the hinge) includes an upper mounting plate 17 to which is secured an upper latch portion 19, these upper latch parts being carried by the cover 13. The box 11 carries a lower mounting plate 21 with a lower latch portion 23. Pivotaly mounted on the latch portion 23 is a lever 25 having a lower curved finger engaging portion. To the side walls of the lever 25 is pivoted a loop or bail 27. As will be better understood from the description to follow, these latch parts described comprise the principal portions of a conventional loop or bail type latch, hereafter referred to as the main latch. This loop or main latch is moved to closed position, as is well understood, by pulling upwardly and outwardly on the lever 25 and looping the bail 27 over the upper latch portion 19 and then pressing the lever 25 toward the box 11 to the position shown in Fig. 2.

As seen in Fig. 3, the upper latch portion 19 includes a pair of side walls 29 connected by a front plate 31 and a top plate 33 which slants downwardly and inwardly toward the cover 13. It is this top plate 33 against which the bail 27 presses when the main latch is latched. The mounting plate 17 is desirably provided with curved edges so that the main portion of the plate is parallel to but spaced from the cover 13. The upper latch portion 19 is secured to the mounting plate 17 in an appropriate manner such as by lugs 35 extending through slots in the mounting plate 17 and bent over.

The lower latch portion 23 includes a front plate 37 desirably bent over at its upper edge to provide an inwardly directed flange 39. A pair of side walls 41 extend backwardly from the side edges of the front plate 37. The bottom mounting plate 21, like the upper mounting plate 17, is desirably curved inwardly at its edges so that the major portion of the mounting plate

is parallel to but spaced from the box 11. The lower housing portion 23 is secured to the mounting plate 21 in any appropriate manner, such as by lugs 43 extending through slots in the mounting plate 21 and bent over.

The lever 25 which is pivotally mounted on the side walls 41 of the lower latch portion 23 is desirably provided by a front plate 45 which is bent inwardly at its upper edge to provide an inwardly directed flange 47. The front plate 45 is extended downwardly and provided with a curved portion 49 conforming generally to the shape of a person's finger. A pair of side walls 57 extend backwardly from the front plate 45.

The lever 25 is pivoted to the lower forward portion of the side walls 41 of the lower latch portion 23 by means of a pivot rod 59 extending between and secured at its opposite ends to the side walls 57, this rod 59 extending through apertures on the parallel side walls 41. Pivoted centrally to the side walls 57 of the lever 25 is the loop or bail 27.

The main or loop latch is latched, as has been described, by looping the bail 27 over the top plate 33 of the upper latch portion 19 and then pressing inwardly on the lever 25. Provision is made for locking the box and the main latch by an ordinary separate lock. For this purpose, the curved finger end 49 is provided with a longitudinally extending slot 61 and the mounting plate 21 has secured to it at its lower edge a projecting ear 63 having an aperture 65. With the main latch in its closed position as shown in Fig. 2, it can be seen that the U-shaped locking arm of an ordinary padlock may be passed through the aperture 65 and snapped shut.

The invention is more particularly directed to an auxiliary latch in combination with a main or loop latch as described, so that if the user forgets to swing the bail 27 and lock the main latch, the box will be alternatively latched so that the contents will not spill out when the user grasps the handle 15 on the cover to lift the box. The front plate 31 of the upper main latch portion 19 in a usual latch of this type extends downwardly with a suitable bend to clear the flange 39 so as to project into the lower main latch portion 23 when the cover 13 of the box is closed. A first auxiliary latch portion for the auxiliary latch is provided by securing to the lower edge of the bottom-most portion of the front plate 31 a downwardly extending projection 67 which is bent inwardly to provide an inwardly directed hooked end 69. Of course, the projection 67 may be integral with the front plate 31, as shown, or may be provided as a separate element which is welded or otherwise fastened to the lower edge of the front plate 31.

A mating second auxiliary latch portion is associated with the lower latch portion 37 of the main latch. The auxiliary latch portion 71 is provided by a resilient spring metal strip which extends at its lower end through a slot in the mounting plate 21 and is bent downwardly and suitably riveted or welded or otherwise secured to the inner surface of the mounting plate 21, as for example by the rivet 72. The strip 71 extends upwardly and outwardly so as to abut the inwardly extending flange 47 on the lever 25 when the main latch is in its closed position as shown in Figs. 1 and 2. Thereafter the strip 71 extends upwardly with a suitable inward bend to clear the hook end 69 of the upper auxiliary latch portion and is turned outwardly at its uppermost end to provide a hook 73. Alternatively, of course, the hook end 73 may be provided by a separate hook welded or otherwise suitably fastened to the surface of the strip 71.

As best shown in Figs. 2 and 3, the auxiliary latch portions are so located that the hook ends 69 and 73 are normally vertically aligned with each other and engageable with each other upon attempting to lift the cover, except when the lever 25 is swung upwardly approximately

to its extreme upper position, substantially the position shown in Fig. 4. As the lever approaches this position, the upper forward corner of the lever (i.e., the corner formed by the junction of the front wall 45 and the top flange 47) pushes rearwardly on the front face of the spring metal strip 71 and cams this strip resiliently rearwardly, displacing the hook portion 73 to a position out of vertical alignment with the hook portion 69, so that the cover of the box may now be fully opened, assuming that the main latch is unlatched.

It should be noted that the flange 47 is so shaped and so placed that the forward pressure exerted by the spring 71 reacts against the flange in such a way as to tend at all times to swing the lever 25 downwardly to its normal rest position shown in Fig. 2. The lever can never remain in the positions shown in Figs. 3 and 4 except by the exertion of upward manual force. Whenever one lets go of the lever 25, in any position such as in Fig. 3 or Fig. 4, the action of the auxiliary latch spring 71 (assisted by the action of gravity) will immediately swing the main latch lever 25 down to its normal or rest position shown in Fig. 2. Thus the auxiliary latch cannot be left accidentally in the released or ineffective position of Fig. 4. Whenever the user's hand is not holding the latch lever 25 up, the auxiliary latch will always be in its effective position, ready to engage automatically when the lid of the box is closed, and ready to hold the lid against opening except to the limited extent of opening required to bring the hook 69 up into engagement with the hook 73.

When the box cover is swung down from an open position to a closed position, the inclined lower face of the hook 69 engages the inclined upper face of the hook 73 and cams the latter rearwardly (flexing the spring strip 71) until the hooks pass each other, whereupon the hook 73 springs forward to a position overlying the hook 69, as in Figs. 2 and 3. Ordinarily, before the closed box is lifted by its handle 15, the user will raise the latch lever 25 to an intermediate position such as in Fig. 3, swing the main latch bail or loop 27 up to overlie the abutment or keeper 33, and then swing the lever 25 down again to its normal rest position (Fig. 2), thus fully latching the main latch. But if the user forgets to do this before lifting the box by the handle 15, the auxiliary latch comes into play and prevents the cover from opening except to a slight extent. Thus the user is not subjected to the inconvenience of spilling the contents of the box on the floor when he inadvertently forgets to lock the main latch.

The present invention thus comprises the combination of a conventional loop latch with an auxiliary latch. The auxiliary latch may be conveniently and easily added to a conventional loop latch of a type presently available on the market. The additional parts for the auxiliary latch include simply the extension 67 and hook end 69 and also the spring strip 71 and its hook end. These parts may be added to the conventional loop latch with no alteration of its construction and function, or with very little alteration thereof, and but little alteration in the manufacturing tools or dies. For instance, the inwardly extending flange 39 on the lower main latch portion 23 may, if desired, be bent upwardly to facilitate the addition of the extension 67 to the bottom of the front plate 31 of the upper latch portion 19. Other than this, little alteration of the conventional loop latch is required. The auxiliary latch is automatically latched when the cover 13 is lowered against the box 11 and remains latched in both the unlatched and latched positions of the main latch as illustrated in Figs. 3 and 2, respectively.

Of course, the latch 9 may be applied to articles other than a utility or tool box, and it operates equally as well if the parts are turned end for end so that the spring strip 71 is moved toward the extension 67, or if both auxiliary latch portions and associated main latch portions are moved toward each other.

It will be noted that in the fully closed position of the box cover, the hook portion 73 is spaced upwardly from

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the hook portion 69 by an appreciable distance, say about $\frac{1}{4}$ to $\frac{1}{2}$ inch. Thus when the handle 15 is lifted when the main latch is not latched, the cover will open slightly until the hook 69 comes up to and is held by the hook 73. The engagement of the hooks 69 and 73 will safely hold the cover against opening far enough to do any damage, but the slight opening of the cover, through a distance of $\frac{1}{4}$ to $\frac{1}{2}$ inch or thereabout, will usually be enough to attract the attention of the user, so that he may set the box down again and latch it securely with the main latch.

It is seen from the foregoing disclosure that the above mentioned objects of the invention are well fulfilled. It is to be understood that the foregoing disclosure is given by way of illustrative example only, rather than by way of limitation, and that without departing from the invention, the details may be varied within the scope of the appended claims.

What is claimed is:

1. In a latch including a main latch, said main latch comprising a first latch portion and a second latch portion, a lever pivoted to said second latch portion, and a bail pivoted to said lever and engageable with said first latch portion in a latched position of said main latch, said main latch having an unlatched position wherein said bail is disengaged from said first latch portion, the improvement including an auxiliary latch, said auxiliary latch including an extension carried by said first latch portion and adapted to extend into said second latch portion in said latched and unlatched positions of said main latch, resilient means, means mounting said resilient means to extend into said second latch portion, hook means carried by said extension and resilient means and adapted to engage in said latched and unlatched positions of said main latch.

2. In a latch including a main latch, said main latch comprising a first latch portion and a second latch portion, a lever pivoted to said second latch portion, and a bail pivoted to said lever and engageable with said first latch portion in a latched position of said main latch, said main latch having an unlatched position wherein said bail is disengaged from said first latch portion, the improvement including an auxiliary latch, said auxiliary latch including an extension carried by said first latch portion and adapted to extend into said second latch portion in said latched and unlatched positions of said main latch, a spring strip, means mounting said spring strip to extend into said second latch portion in position to be engaged by said lever, hook means secured to said extension and spring strip and adapted to engage in said latched and unlatched positions of said main latch, said lever being adapted to unlatch said auxiliary latch.

3. In a latch including a main latch, said main latch including a first latch portion and a second latch portion, a lever pivoted to said second latch portion, and a bail pivoted to said lever and engageable with said first latch portion in a latched position of said main latch, the improvement comprising an auxiliary latch, said auxiliary latch including an extension having a first hook end, said extension being secured to said first main latch portion and extending into said second main latch portion in said latched position, a spring strip having a second hook end engageable with said first hook end, and means mounting said spring strip extending through said second main latch portion and in position to be unlatched by said lever.

4. In a latch including a main latch, said main latch including a first latch portion and a second latch portion, a lever pivoted to said second latch portion, and a bail pivoted to said lever and engageable with said first latch portion in a latched position of said main latch, the improvement comprising an auxiliary latch, said auxiliary latch including a first auxiliary latch portion comprising an extension carried by said first main latch portion, a second auxiliary latch portion, means mounting said sec-

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ond auxiliary latch portion, and releasable interengageable means carried by said first and second auxiliary latch portions.

5. A latch including the combination of a main latch and an auxiliary latch, said main latch comprising a first latch portion and a second latch portion, a lever pivoted to said second latch portion, a bail pivoted to said second latch portion and engageable with said first latch portion in a latched position of said main latch, said main latch having an unlatched position in which said bail is disengaged from said first latch portion, said auxiliary latch comprising an extension secured to said first main latch portion and adapted to extend into said second latch portion, a spring strip, means mounting said spring strip to extend into said second main latch portion, and means on said spring strip and extension for latching engagement in both said latched and unlatched positions of said main latch.

6. A latch including the combination of a main latch and an auxiliary latch, said main latch comprising a first latch portion and a second latch portion, a lever pivoted to said second latch portion, a bail pivoted to said second latch portion and engageable with said first latch portion in a latched position of said main latch, said main latch having an unlatched position in which said bail is disengaged from said first latch portion, said auxiliary latch comprising an extension secured to said first main latch portion and having a first hook end, a spring strip having a second hook end for engagement with said first hook end in said latched and unlatched positions of said main latch, and means mounting said spring strip to extend into said second main latch portion and in position to be unlatched by said lever.

7. A latch including the combination of a main latch and an auxiliary latch, said main latch comprising a first latch portion and a separate second latch portion, said first latch portion including a front plate and connected side walls and sloping top plate, said second latch portion including a front wall plate and a pair of connected side walls, a lever pivoted to said second latch portion side walls and having an inwardly extending top flange, a bail pivoted to said lever and adapted to extend over said first latch portion top plate in a latched position of said main latch, said bail being disengaged from said first latch portion in an unlatched position of said main latch, said auxiliary latch including an extension secured to said first latch portion front plate and having a hook end, said extension being received within said second latch portion in said latched and unlatched position of said main latch, a spring strip having a hook end, means mounting said spring strip to extend into said second latch portion and in position to be engageable with said flange on said lever, hook means on said spring strip adapted to engage with said extension hook end in said latched and unlatched positions of said main latch, said auxiliary latch being adapted to be unlatched by movement of said lever to press said top flange thereon against said spring strip.

8. A construction as defined in claim 7, including a pair of mounting plates, means securing each of said first and second main latch portions to one of said mounting plates, said means for mounting said spring strip being carried by one of said mounting plates.

9. The combination with a box having a cover member hinged to a body member, of a main latch for holding said cover member in tightly closed relation to said body member, said main latch including a handle pivoted to one of said members and a bail pivoted to said handle for engaging a part on the other of said members, said handle and bail together acting as a toggle to draw said cover member and body member tightly toward each other, an auxiliary latch comprising a spring tongue secured to the one of said members to which said handle is pivoted, said spring tongue having a hook end for automatically engaging behind a part on the other of

said members during closing movement of said cover member, in position to allow limited opening movement of said cover member with respect to said body member and to prevent further opening movement of said cover member, and a part on said handle for engaging said spring tongue upon movement of said handle to a predetermined position, for flexing said spring tongue to shift said hook end thereof to a non-obstructing position so that said cover member may open further.

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