United States Patent [19]

Shute

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[54] **LOCKING MECHANISM**

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[52] **U.S. Cl.** ..... **16/147,** 248/361 R

[51] **Int. Cl.** **E04d 15/50**

[58] **Field of Search** 248/361; 16/147; 105/281

[56] **References Cited**

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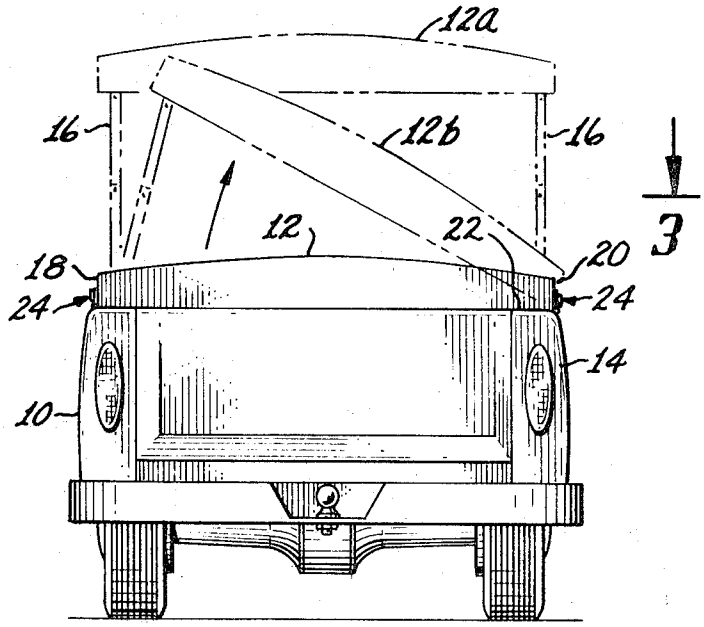
Primary Examiner—William H. Schultz

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[57] **ABSTRACT**

A cover of the type mounted to a stationary structure in a manner so that it may be opened from either of two opposite sides is provided with a locking mechanism on each of its openable sides, the locking mechanisms are each provided with a pivot member so that by unlocking one of the sides the cover may be pivotably moved about the juncture formed between the locked side and the stationary structure.

8 Claims, 6 Drawing Figures



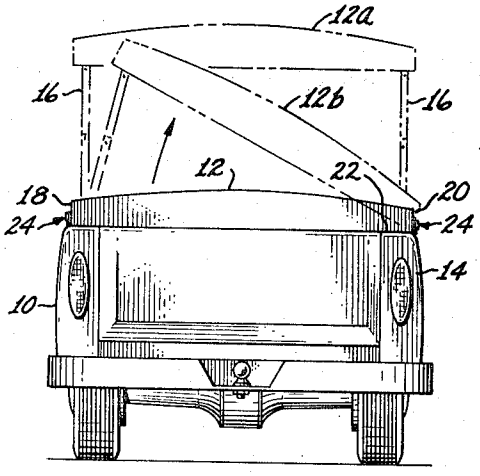


Fig. 1

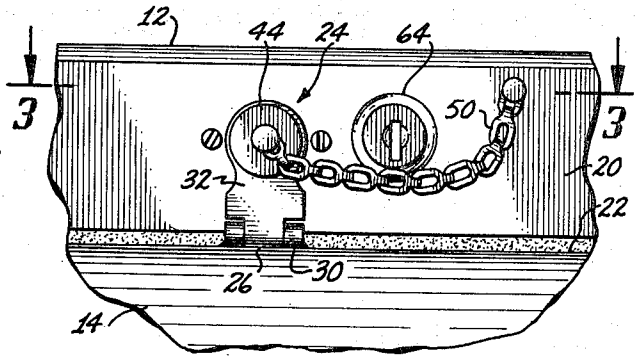


Fig. 2

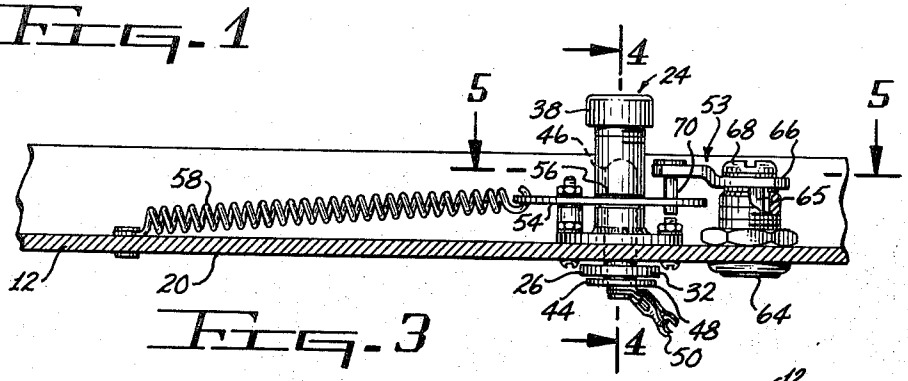


Fig. 3

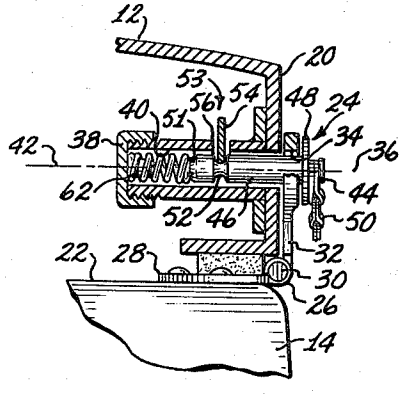


Fig. 4

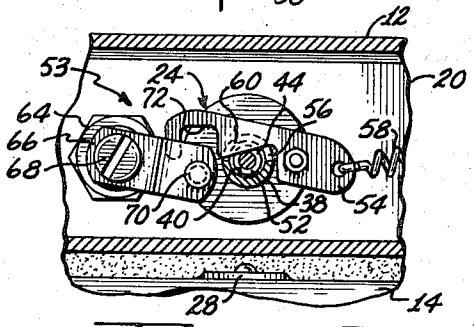


Fig. 5

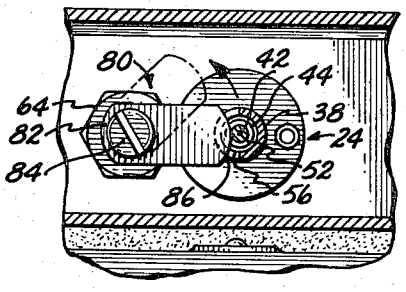


Fig. 6

LOCKING MECHANISM

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to locks and more particularly to a locking mechanism which allows pivotable movement of the locked structures about the pivot axis of the locking mechanism.

2. Description of the Prior Art

The locking mechanism of the present invention is a special purpose device particularly adapted for use with extensible structures of the type fully disclosed in U. S. Pat. application Ser. No. 65,643 filed Aug. 20, 1970 by the same inventor.

Briefly, the apparatus disclosed in the above referenced U. S. Pat. application is a cover structure extensibly mounted on a stationary structure so that the cover may be opened from either of two opposite sides. Opening of this apparatus is accomplished by raising a desired one of the openable sides which which causes the cover to pivot about the line of juncture formed between the opposite openable side and the stationary structure.

To lock this type of apparatus, requires that separate locking device be employed to lock each of the openable sides of the cover to the stationary structure.

Conventional bolt-type locks may be employed for this application, however, due to their lack of a pivot or hinge type mechanism, both sides of the cover would have to be unlocked before the cover could be opened.

A hasp and padlock arrangement could be satisfactorily employed due to the hinge feature of the hasp. However, this type of arrangement positions the entire locking assembly externally of the structure, thus not only providing an unsightly assembly, but exposing it to the elements, vandalism and the like.

Therefore, a need exists for a new and useful locking mechanism which substantially eliminates the problems associated with the prior art devices.

SUMMARY OF THE INVENTION

In accordance with the invention disclosed herein, there is provided a new and useful mechanism for locking an extensible cover to a stationary structure. The cover being of the type designed to be opened from either of two opposite sides.

The locking mechanism of the present invention comprises a pivot means or hasp fixedly secured to the stationary structure and having a hinged tongue movable into juxtaposed relationship with respect to the extensible cover. The movable tongue portion of the hasp has an apperture formed therein which is axially alignable with the bore formed in a cylindrical housing. The housing is mounted internally of the cover so that the bore opening is flush with the external surface of the cover. A plunger is inserted through the apperture of the hasp and into the bore of the housing and is releasably held therein by locking latch means mounted internally of the extensible cover.

In the Preferred Embodiment, the locking latch means includes a key-actuated lock having a lever mounted on one end thereof so that when the lock is actuated it moves the lever into engagement with a latch which normally retains the plunger in the housing. Movement of the lever moves the latch causing it to release the plunger so that it may be withdrawn from the housing.

Accordingly, it is an object of the present invention to provide a new and useful locking mechanism.

Another object of the present invention is to provide a new and useful locking mechanism for use with an extensible structure of the type which may be pivotably opened from either of two opposite sides.

Another object of the present invention is to provide a new and useful mechanism for locking an extensible cover to a stationary structure at a juncture formed between the juxtaposed side edges, the locking mechanism having a hinged member which allows pivotable movement of the cover about the line of juncture.

Another object of the present invention is to provide a new and useful locking mechanism of the above described character wherein a substantial portion of said mechanism is positioned within the extensible structure.

The foregoing and other objects of this invention, as well as the invention itself, may be more fully understood when read in conjunction with the following drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a rear elevation of a stationary structure having an extensible structure mounted thereon and including the locking mechanism of the present invention.

FIG. 2 is an enlarged fragmentary side view of the extensible structure and the stationary structure having the locking mechanism of the present invention installed thereon.

FIG. 3 is a fragmentary top sectional view of the locking mechanism of the present invention taken on the line 3—3 of FIG. 2.

FIG. 4 is a fragmentary sectional view taken on the line 4—4 of FIG. 3.

FIG. 5 is a fragmentary sectional view taken on the line 5—5 of FIG. 3.

FIG. 6 is a fragmentary sectional view similar to FIG. 5 showing a modified form of the mechanism of the present invention.

DESCRIPTION OF THE REFERRED EMBODIMENT

Referring more particularly to the drawing, FIG. 1 illustrates a rear elevational view of the automotive vehicle **10** of the type commonly called a pick-up truck. The vehicle **10** has an extensible cover assembly **12** mounted on its bed **14** by means of a plurality of folding arms **16**. The cover **12** may be positioned as shown in solid lines to completely close the bed **14**, or the cover **12** may be fully extended therefrom as shown in the dash line position identified with the reference numeral **12***a*.

The fully extended position **12***a* of the cover **12** may be employed when it is desired to carry large cargo or when the vehicle **10** is to be used as a camper. However, partially extended positioning of the cover **12** is possible when access to the bed **14** is desired.

Partial extension of the cover **12** is shown in the dash line position **12***b* of FIG. 1 as having been accomplished by raising one side **18** of the cover. This movement causes the cover **12** to pivot about the juncture formed between the side **20** of the cover and the upper surface **22** of the bed **14** to which the cover is adjacent. An identical movement in reverse (not shown) may be accomplished by raising the side **20** of the cover **12**.

Thus, access to the bed 14 of the vehicle 10 may be accomplished by raising either one of the openable sides 18 or 20 of the cover 12.

It should be understood that the specific structures described above do not form a part of this invention, as any stationary structure (vehicle 10) having an extensible structure (cover 12) mounted thereon, may be employed equally well with the locking mechanism 24 of the present invention.

As seen in FIG. 1, one of the locking mechanisms 24, to be hereinafter described in detail, is provided adjacent to each of the openable sides 18 and 20 of the cover 12. The locking mechanisms 24 are designed so that in order to partially extend the cover 12 only the mechanism 24 adjacent to the side to be raised need be unlocked.

The locking mechanism 24, as seen in FIGS. 2 through 5 includes a pivot means or hasp 26 having a fixed member 28 attached to the upper surface 22 of the bed 14. The hasp 26 has the usual hinge 30 about which a movable tongue 32 is free to pivot. The movable tongue 32 is provided with an aperture 34 formed therethrough which as seen in FIG. 4 has its axis 36 positioned normal to the side 20 of the cover 12 when the tongue 32 is moved into juxtaposed relationship with respect to the side 20.

A cylindrical housing 38 is suitably mounted on the internal surface of the side 20 of the cover 12 and has a bore 40 formed therein. The housing 38 is positioned to that the opening of the bore is flush with the side 20, and the longitudinal axis 42 of the bore 40 is in alignment with the axis 36 of the aperture 34 thus providing an axially alignable relationship between the bore and the aperture when the tongue 32 is positioned as previously described. The housing 38 has a slot 56 formed therein which is transverse with respect to the bore 40 and provides access from the exterior of the housing into the bore.

A plunger 44 having a cylindrical shank 46 and an intergrally formed flanged 48 on one end thereof is movably secured to the exterior surface of the side 20 by a suitable chain 50. The shank 46 is provided with an annular groove 52 formed adjacent to a beveled end 51 thereof which is opposite to the end upon which the flange 48 is formed. The plunger 44 may be inserted through the aperture 34 of the hasp 26 and then inserted into the bore 40 of the housing 38, so that when inserted, the groove 52 of the plunger 44 is in alignment with the slot 56 of the housing 38.

The plunger 44 is releasably held within the bore 40 of the housing 38 by a locking latch means 53. The preferred embodiment of the locking latch means 53 is illustrated in FIGS. 3, 4, and 5 to include a latch 54 which s mounted on the housing 38 for pivotal movement in a plane which is perpendicular to the longitudinal axis 42 of the bore 40 and is in alignment with the slot 56 of the housing. A tension spring 58 is attached on one of its ends to the cover 12 and on its other end to the latch 54 for yieldingly biasing the latch towards the slot 56. A tab 60 formed along the length of the latch 54 is urged into the bore 40 through the slot 56 for engaging the groove 52 of the plunger 44 and thus retaining the plunger within the bore 40.

A conventional key actuated lock assembly 64 is mounted within the cover 12 adjacent to the housing 38, and has a lever 66 mounted such as by a screw 68 to its innermost end. As is well known in the art, turning a key (not shown) within the lock assembly 64 results in a rotary movement of its internal elements 65. The lever 66 is coupled to move with these elements and will therefore rotate through an arcuate path of substantially 90 degrees. The extending end of the lever 66 has a pin 70 formed transversely thereon which is positioned for engagement with a notch 72 formed in one end of the latch 54. When the lever 66 is rotated through its prescribed path as hereinbefore described, the pin 70 will move into engagement with the notch 72 and lift the latch out of groove 52 of the plunger 44 thus releasing it for removal from the bore 40.

As seen in FIG. 4 a compression spring 62 is mounted within the bore 40 of the housing 38 for engaging the plunger 44. When the latch 54 is actuated to release the plunger, movement of the plunger out of the bore will be accomplished by the spring 62.

It should be noted that the above described preferred form of the locking latch means 53 allows the locking mechanism 24 to to be locked without the use of a key. This is possible due to the yieldable biasing of the lever 54. When the plunger 44 is inserted within the bore 40 of the housing, the beveled end 51 of the plunger will deflect the latch 54 and allow the plunger to move past the latch. When the groove 52 of the plunger 44 moves into alignment with the latch 54, the spring 58 will cause the latch to snap into the groove.

FIG. 6 illustrates a locking latch means 80 which is a simplified modification of the previously described locking latch means 53. Although this modification has the obvious advantage of being less costly to fabricate due to its fewer components, it has a disadvantage in that a key is needed to both unlock and lock the mechanism.

The locking latch means 80 includes the same key actuated lock assembly 64 which as previously described is adapted to rotate its internal elements 65 through an arcuate path of substantially 90 degrees. A lever 82 is attached to the elements 65 by a suitable screw 84 and is movable therewith in a plane of rotation that is perpendicular to the longitudinal axis 42 of the bore 40, and this rotational plane is aligned with the slot 56 of the housing 38. The lever 82 extends from the lock assembly 64 so that its extending end 86 will protrude into the groove 52 of the plunger 44. When the lock assembly 64 is actuated through its rotary path, the lever 82 will move to the dash line position, and thus be retracted from the groove 52, which allows the plunger to be removed from the housing.

While the principles of the invention have now been made clear in the preferred embodiment, there will be immediately obvious to those skilled in the art many modifications in structure, arrangements, proportions, the elements, and materials used in the practice of the invention, and otherwise, which are particularly adapted to specific environments and operating requirements without departing from those principles. The appended claims are therefore intended to cover and embrace any such modifications within the limits of the true scope of the invention.

What I claim is:

1. A locking mechanism comprising:

a. a stationary structure having a movable structure extensibly mounted thereon;

b. pivot means fixedly attached on one end thereof to said stationary structure and having a tongue movable into juxtaposed relationship to a surface of the

movable structure, the tongue having an aperture formed therethrough;

c. a housing mounted on the movable structure and having bore formed therein, said housing positioned so that the aperture of the tongue of said pivot means is axially alignable with the bore thereof, said housing having a slot formed therein transverse to its bore and opening thereinto;

d. a plunger axially insertable through the apreture of the tongue of said pivot means and into the bore of said housing, said plunger having a groove therein which aligns with the slot of said housing when said plunger is inserted therein; and

e. locking latch means mounted on the movable structure and retractably movable through the slot of said housing into the groove of said plunger for releasably retaining said plunger within the bore of said housing.

2. A locking mechanism as claimed in claim **1** wherein said pivot means includes a hasp having the tongue hingedly mounted thereon.

3. A locking mechanism as claimed in claim **1** wherein said plunger includes a cylindrical shank having the groove formed in an annular configuration adjacent to one end thereof and having a flange on the opposite end.

4. A locking mechanism as claimed in claim **1** further including biasing means within the bore of said housing for engaging said plunger and yieldingly urging said plunger out of the bore of said housing.

5. A locking mechanism as claimed in claim **1** wherein said locking latch means comprises:

a. a latch mounted on said housing for pivotable movement in a plane perpendicular to the longitudinal axis of the bore of said housing, said latch positioned so that its pivot plane is aligned with the slot formed in said housing;

b. biasing means attached to the movable structure and to said latch for yieldingly urging the latch into the slot of said housing; and

c. key-actuated means mounted on the movable structure adjacent to said housing for retracting said latch from the slot of said housing upon actuation thereof.

6. A locking mechanism as claimed in claim **5** wherein said latch has a notch formed on one end thereof for engagement by said key-actuated means, said latch having a tab formed along its length for entry into the slot of said housing.

7. A locking mechanism as claimed in claim **5** wherein said key-actuated means comprises:

a. a lock having a portion thereof rotatable through an arc of substantially 90°;

b. a lever attached to the rotatable portion of said lock and movable therewith; and

c. a pin transversely mounted on one end of said lever.

8. A locking mechanism as claimed in claim **1** wherein said locking latch means comprises:

a. a lock having a portion thereof rotatable through an arc of substantially 90°;

b. a lever attached to the rotatable portion of said lock and movable therewith in a plane perpendicular to the longitudinal axis of the bore of said housing, said lever positioned so that its plane of rotation is in alignment with the slot of said housing, said lever extending from said lock so that its extending end will normally protrude into the bore of said housing and will be retracted therefrom when moved by said lock through its rotational plane.

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