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Miller

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[54] **DOOR LOCK MEANS**

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[52] **U.S. Cl.** **70/146,** 70/208, 292/173

[51] **Int. Cl.** **E05b 5/00**

[58] **Field of Search** 70/145, 146, 208; 292/173, 292/DIG. 31

[56] **References Cited**

UNITED STATES PATENTS

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Primary Examiner—Albert G. Craig, Jr.

Attorney, Agent, or Firm—Johnson, Dienner, Emrich & Wagner

[57] **ABSTRACT**

A lock bolt operating handle assembly having a pan-shaped housing unit presenting front and back face portions in spaced-apart planes and a closed exposed front surface. A lock bolt engaging and operating member is located rearwardly of the exposed front surface and projects through the plane of the back face portion. Arm means pivotally mount the operating member in the housing unit on an axis intermediate of the planes of the front and back face portions and project through the exposed front surface. A handle, normally lying intermediate of the planes of the front and back face portions, is secured to the arm means forwardly of the exposed front surface for effecting pivotal movement of the arm means and the operating member.

6 Claims, 7 Drawing Figures

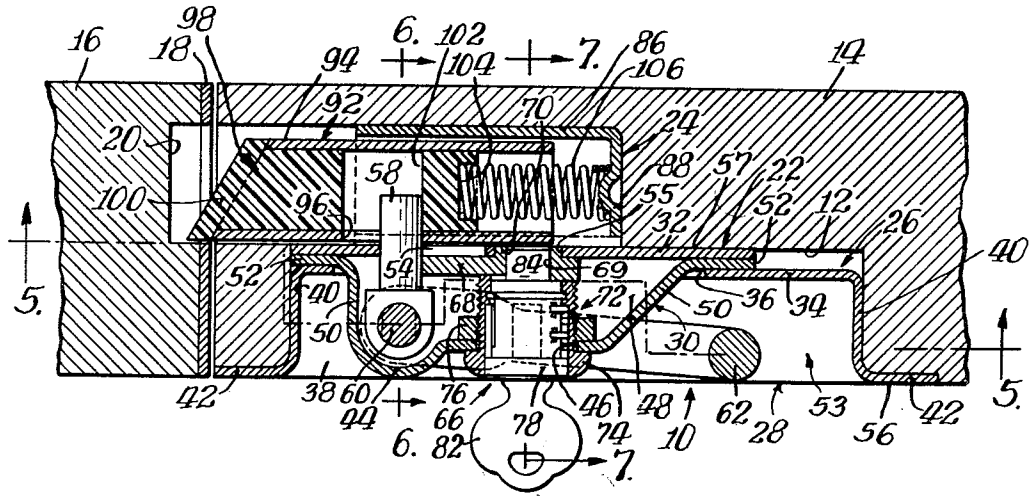


Fig. 1.

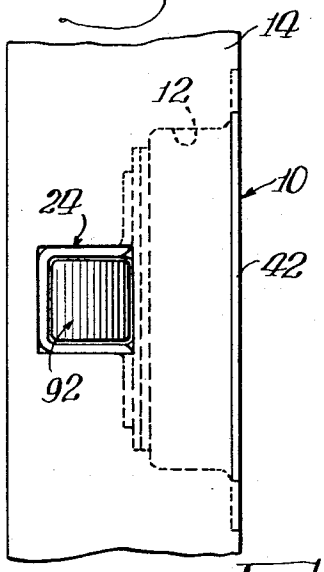


Fig. 2.

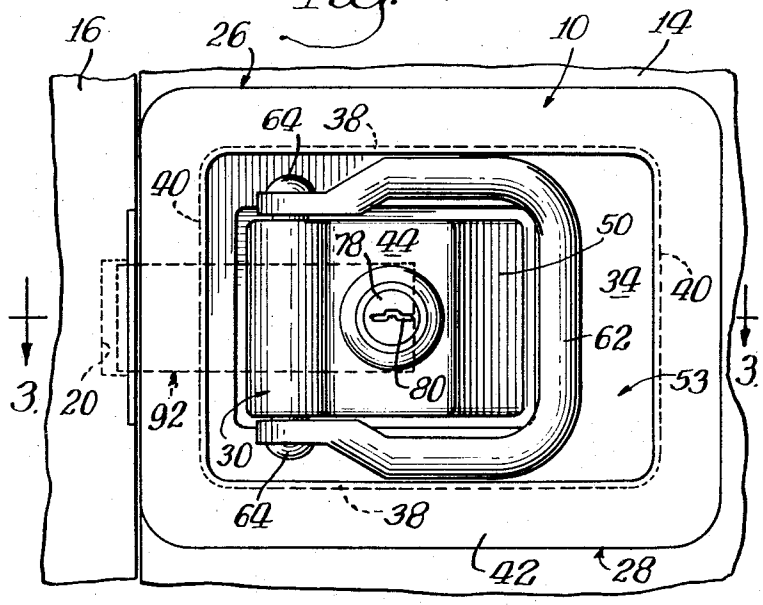


Fig. 3.

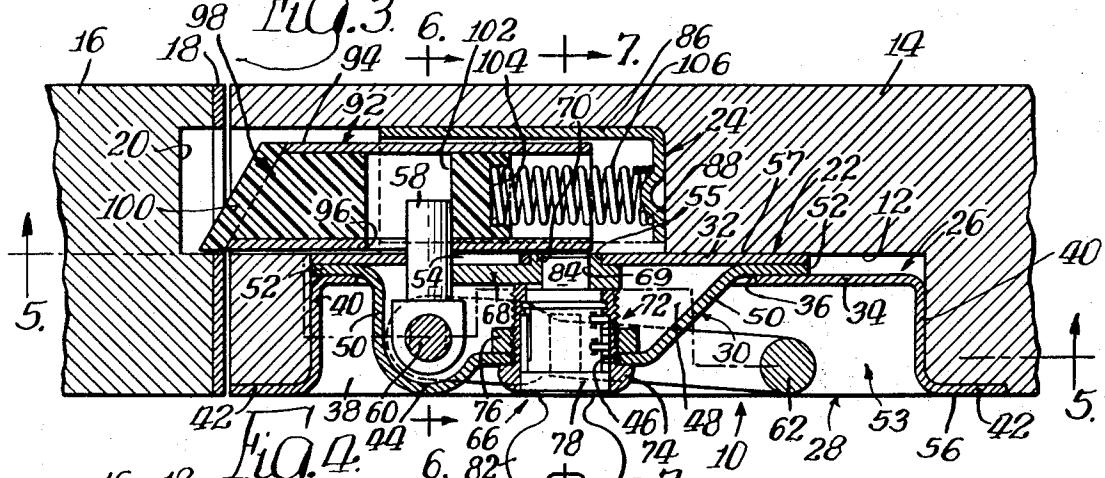


Fig. 4.

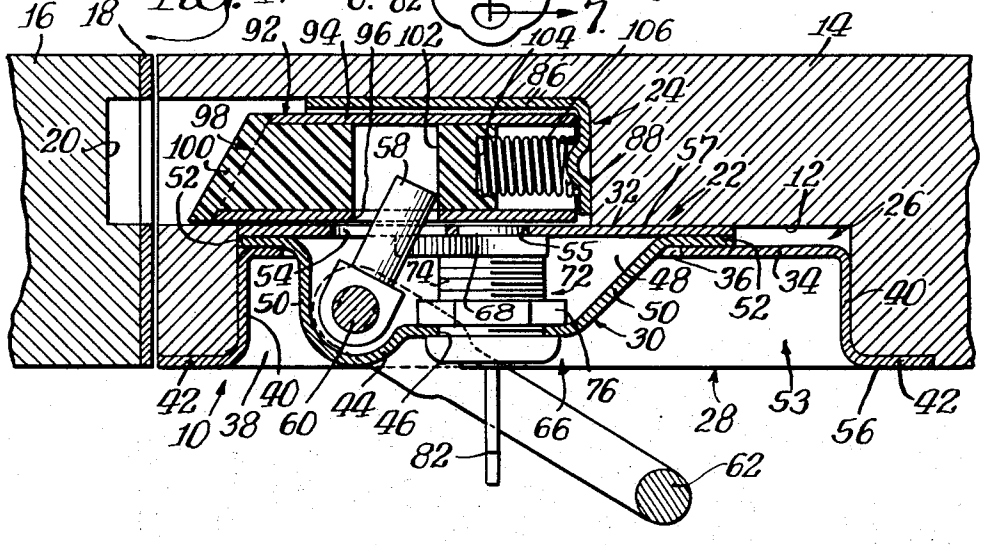


Fig. 5.

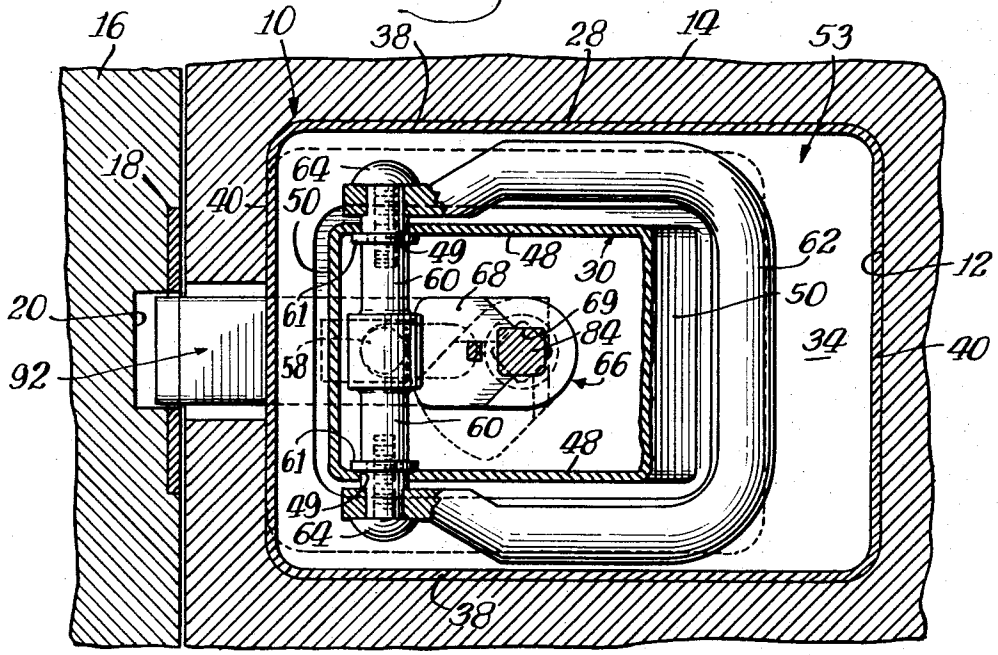


Fig. 6.

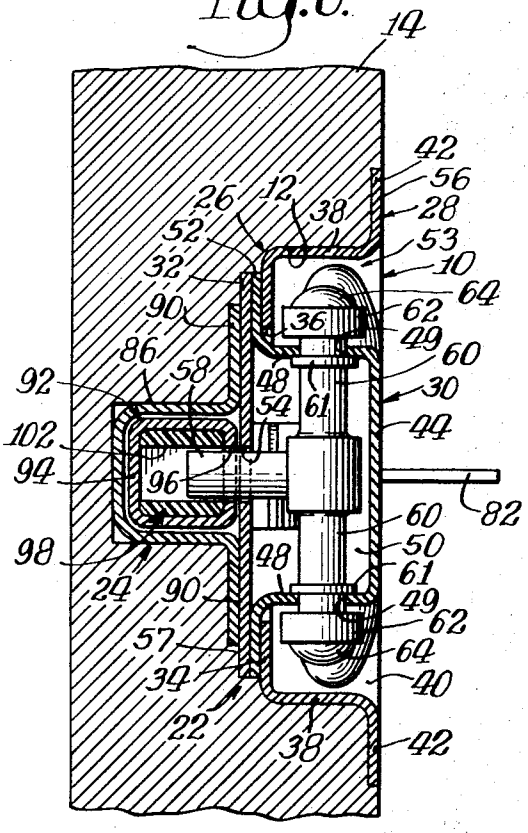
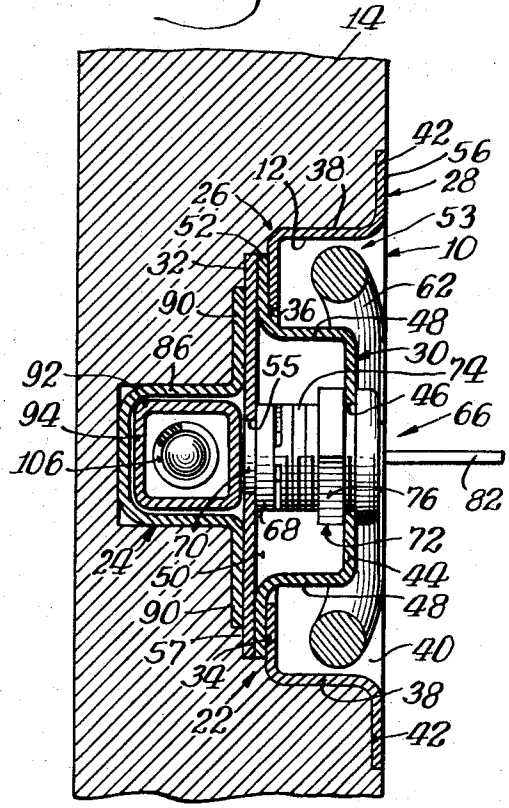


Fig. 7.



DOOR LOCK MEANS

BACKGROUND OF THE INVENTION

The present invention pertains to flush-type door locks adapted for use on the doors of vehicles such as trucks and the like.

Conventional flush-type door locks comprise a lock bolt assembly including a slidable lock bolt, and an operating handle assembly including an operating handle for retracting the lock bolt. Existing lock bolt assemblies are incompletely enclosed or covered along the sides adjacent the associated operating handle assemblies; thus undesirable water, ice, dirt and other waste material are free to enter through the operating handle assemblies and to collect interiorly of the lock bolt assemblies adversely affecting operation of the slidable lock bolts.

SUMMARY OF THE INVENTION

The lock bolt operating handle assembly of the present invention includes a pan-shaped housing unit on the back side of which is adapted to be mounted a conventional lock bolt assembly. The pan-shaped housing unit presents a closed exposed front surface whereby the side of the lock bolt assembly adjacent the housing unit is completely shielded from water, ice, dirt and other waste material.

In addition, the lock bolt operating handle assembly includes a pivotal lock bolt operating member connected to an operating handle and engageable with the slidable lock bolt of the conventional lock bolt assembly, and a locking assembly including a pivotal locking member selectively movable into blocking engagement with the lock bolt operating member for preventing pivotal movement of the latter whereby to secure the door lock.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a partial edge view of a door in which door lock means embodying the principles of the present invention is mounted;

FIG. **2** is a partial front view of the door and door lock means of FIG. **1**, and of a door jam adjoining the edge of the door;

FIG. **3** is a sectional view taken substantially along the line **3—3** of FIG. **2** looking in the direction indicated by the arrows, with the parts being shown in a locked position;

FIG. **4** is a sectional view corresponding generally to FIG. **3**, with the parts being shown in an unlocked position;

FIG. **5** is a sectional view taken substantially along the line **5—5** of FIG. **3** looking in the direction indicated by the arrows;

FIG. **6** is a sectional view taken substantially along the line **6—6** of FIG. **3** looking in the direction indicated by the arrows; and

FIG. **7** is a sectional view taken substantially along the line **7—7** of FIG. **3** looking in the direction indicated by the arrows.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, there is indicated generally by the reference numeral **10** a flush-type door lock. The door lock **10** is adapted to be mounted in a recess **12** formed at the edge of a door **14** associated

with a side door jam **16**. The door jam **16** is provided with a keeper plate **18** and a keeper notch **20** which are arranged in a conventional manner for cooperation with a lock bolt.

The door lock **10** is comprised of a lock bolt operating handle assembly **22** embodying the principles of the present invention, and a typical type of conventional lock bolt assembly **24**.

The lock bolt operating handle assembly **22** comprises a pan-shaped housing unit **26** having a main housing section **28**, a central bulbous or cup section **30**, and a back panel **32**. The main housing section **28** is formed with a back wall **34** in which an opening **36** is provided, opposed side walls **38**, opposed end walls **40**, and a peripheral front flange **42** set flush with the front face of the door **14**. The bulbous section **30** is formed with a front wall **44** in which an aperture **46** is provided, opposed side walls **48** in which apertures **49** are provided, opposed end walls **50**, and a peripheral back flange **52** secured about the edges of the back wall opening **36**. The main housing section **28** defines a recessed or depressed area **53** about the bulbous section **30**. The back panel **32** is suitably secured to the peripheral back flange **52**, and is formed with a slot **54** and an aperture **55**. The housing unit **26** presents front and back face portions **56** and **57** in spaced-apart planes.

A lock bolt engaging and operating member **58** is located within the bulbous section **30** and projects through the back wall opening **36** and the back panel slot **54**. Extending laterally from the operating member **58** are a pair of opposed arm members **60** which project through and are journaled in the side wall apertures **49** on an axis intermediate of the planes of the front and back face portions of the housing unit **26**. The arm members **60** are maintained in position by snap rings **61**. The ends of a generally C-shaped handle **62** are secured by screws **64** to the ends of the arm members **60**. The handle **62** normally lies in the recessed area **53** intermediate of the planes of the front and back face portions of the housing unit **26**, and upon outward swinging effects pivotal movement of the arm members **60** and the operating member **58**.

Associated with the housing unit **26** and the operating member **58** is a locking assembly **66** which comprises a locking member or arm **68**. The member **68** is selectively engagable with the operating member **58**, is provided with an aperture **69**, and has a collar portion **70** pivotally supported in the back panel aperture **56** on an axis normal to the planes of the front and back face portions of the housing unit **26**. The locking assembly **66** further includes locking means in the form of a key-actuated locking device **72** comprised of a sleeve member **74** secured in the front wall aperture **46** by a nut **76**. Mounted in the sleeve member is a key-actuated lock cylinder **78** which has a key slot **80** adapted to receive a key **82**, and which has a rotatable stud **84** engaged in the locking arm aperture **69** and the collar portion **70**. Since the back wall opening **34** is closed by the bulbous section **30**, the front wall aperture **46** is closed by the locking device **72**, and the side wall apertures **49** are closed by arm members **60**, the housing unit **26** presents a closed exposed front surface and hence completely shields the adjacent side of the lock bolt assembly **24**.

The lock bolt assembly **24** comprises a generally U-shaped metal channel guide member **86**. As shown in FIGS. **3** and **6**, the channel member **86** has a closed end

88, and has side flanges 90 suitably secured to the back panel 32. Slidably guided in the channel member 86 is a lock bolt 92 comprised of a square hollow metal tube 94 having an opening 96 in one side thereof aligned with the back panel slot 54. Disposed and secured in the tube 94 is a plastic insert 98 formed with a projecting outer head portion 100, with an intermediate recess 102 aligned with the tube opening 96, and with a rear cutout 104. The lock bolt 92 is biased outwardly of the channel member 86 by a compression spring 106 arranged between the channel member end 88 and the insert cutout 104. The control and retraction of the lock bolt 92 is effected by the lock bolt engaging and operating member 58 which projects into the recess 102 of the lock bolt 92.

With the elements of the door lock 10 positioned as shown in FIG. 3, the door 14 is securely locked to the door jam 16. The outer end of the lock bolt 92 is maintained in the keeper notch 20 by the spring 106, and the locking member 68 is engaged against the operating member 58 to prevent outward pivotal movement of the operating handle 62.

When the door 14 is to be opened, the key 82 is inserted in the key slot 80 and turned counterclockwise, as viewed in FIG. 1. As the key 82 is turned, the stud 84 rotates and the locking member 68 is revolved from the solid line position shown in FIGS. 3 and 5 to the dotted line position shown in FIG. 5. In this manner, the locking member 68 is removed from locking engagement with the operating member 58. Then, the operating handle 62 is pulled pivotally outwardly from the position shown in FIG. 3 to the position shown in FIG. 4. As the operating handle 62 is thus pivoted, the operating member 58 riding in contact with the plastic insert 98 moves the lock bolt 92 inwardly of the channel member 86, against the force of spring 106, thereby effecting withdrawal of the lock bolt 92 from the keeper notch 20 and clear of the keeper plate 18. At this point, the door 14 may be swung open with additional pull on the operating handle 62 or otherwise.

Upon release of the operating handle 62, the spring 106 returns the lock bolt 92 and operating member 58 to the position shown in FIG. 3. When the door 14 is thereafter swung closed, the lost motion connection afforded by the lock bolt opening 96 and recess 102 permits the lock bolt 92 to snap into engagement with the keeper notch 20. Locking of the door is completed by turning the key 82 to return the locking member 68 to the blocking position shown in FIG. 3.

While there has been shown and described a preferred embodiment of the present invention, it will be understood by those skilled in the art that various rearrangements and modifications may be made therein without departing from the spirit and scope of the invention.

The invention claimed is:

1. A lock bolt operating handle assembly comprising a pan-shaped housing unit presenting front and back face portions in spaced-apart planes and a closed exposed front surface, a lock bolt engaging and operating member located rearwardly of said exposed front surface and projecting through the plane of said back face portion, arm means pivotally mounting said operating member in said housing unit on an axis intermediate of the planes of said front and back face portions and projecting through said exposed front surface, and a handle normally lying intermediate of the planes of said front and back face portions and secured to said arm means forwardly of said exposed front surface for effecting pivotal movement of said arm means and said operating member.

2. The lock bolt operating handle assembly of claim 1 including a locking member engagable with said operating member and pivotally mounted in said housing unit on an axis normal to the planes of said front and back face portions, and locking means for selectively holding said locking member and said operating member in a locked position against any pivotal movement.

3. The lock bolt operating handle assembly of claim 1 wherein said housing unit has a main housing section with a recessed area and a bulbous section within said recessed area, said arm means is pivotally mounted in said bulbous section and has ends projecting into said recessed area, and said handle is C-shaped and normally lies within said recessed area.

4. A lock bolt operating handle assembly comprising a main pan-shaped housing section with side walls and end walls and a back wall in which an opening is formed, a central bulbous section with a front wall and side walls and end walls and a peripheral back flange secured about the edges of said back wall opening, a lock bolt engaging and operating member located within said bulbous section and projecting through said back wall opening, arm means pivotally mounting said operating member in said side walls of said bulbous section, and a C-shaped handle normally lying in the recessed area intermediate of said side and end walls of said main housing section and said bulbous section and secured to said arm means for effecting pivotal movement of said arm means and said operating member.

5. The lock bolt operating handle assembly of claim 4 wherein said housing unit includes a back panel secured to said back flange of said bulbous section and having a slot formed therein, and said operating member projects through said slot.

6. The lock bolt operating handle assembly of claim 4 including a locking member engagable with said operating member and pivotally mounted in said back panel on an axis normal to the plane of the latter, and locking means supported in said bulbous section for selectively holding said locking member and said operating member in a locked position against any pivotal movement.

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