

[54] DOOR LOCK ASSEMBLY
 [75] Inventor: John V. Pastva, Jr., Parma Heights, Ohio
 [73] Assignee: The Eastern Company, Cleveland, Ohio
 [22] Filed: Aug. 30, 1972
 [21] Appl. No.: 285,044

1,143,653 6/1915 Smith..... 292/25
 2,173,671 9/1939 Webber..... 292/25
 2,181,393 11/1939 Crooks..... 292/25
 2,224,671 12/1940 Crooks..... 292/25 X
 3,659,886 5/1972 Andrews..... 292/78

Primary Examiner—Richard E. Moore
 Attorney, Agent, or Firm—Watts, Hoffmann, Fisher & Heinke Co.

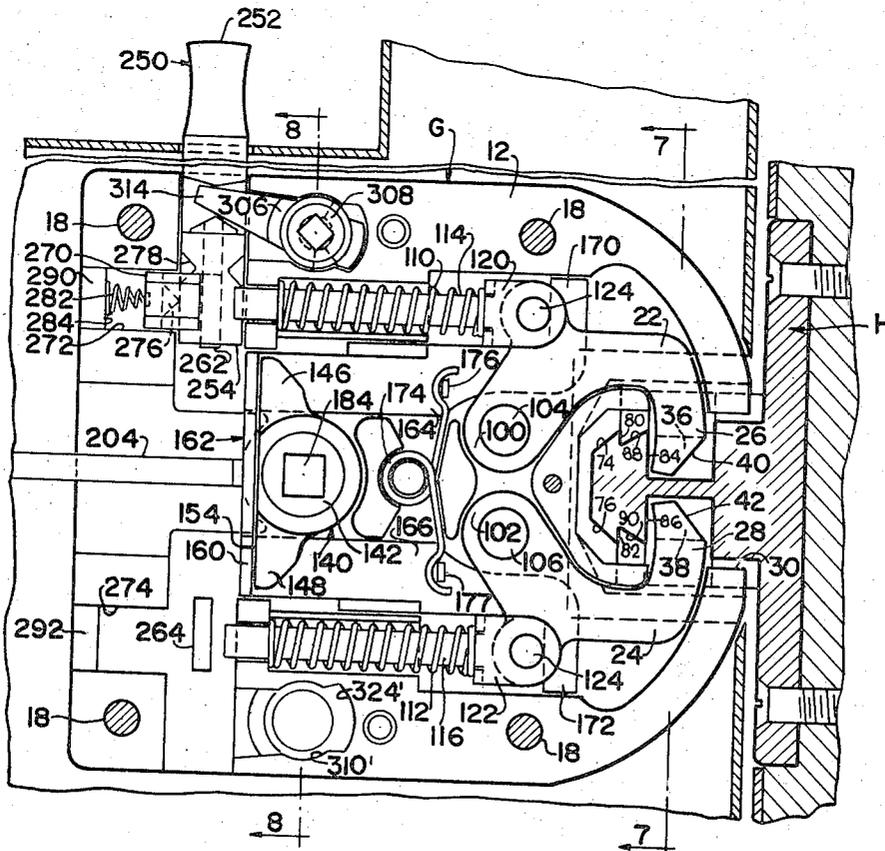
[52] U.S. Cl. 292/27
 [51] Int. Cl. E05c 3/34
 [58] Field of Search 292/24, 25, 27, 30, 49, 292/124, 169, DIG. 46

[57] ABSTRACT

A manual external-internal manipulator-operated, double catch, spring-biased, slam, multiple swinging bolt, keeper interlocking lock assembly for swinging or sliding doors.

[56] References Cited
 UNITED STATES PATENTS
 789,775 5/1905 Ward..... 292/27

17 Claims, 12 Drawing Figures



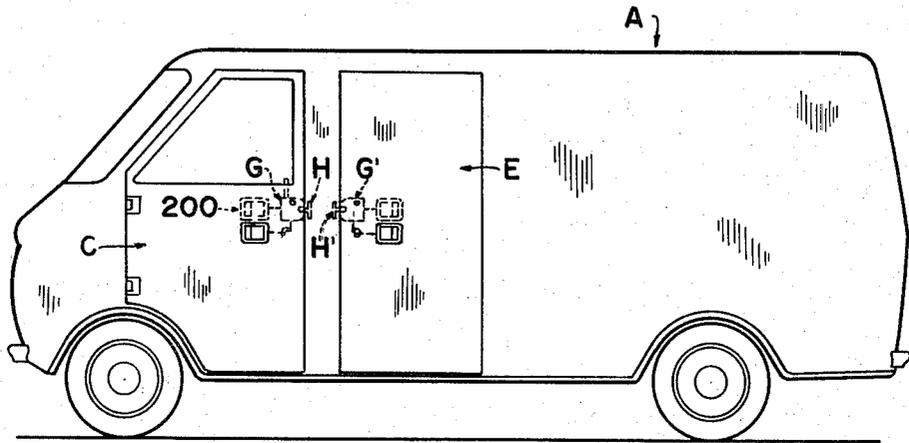


FIG. 1

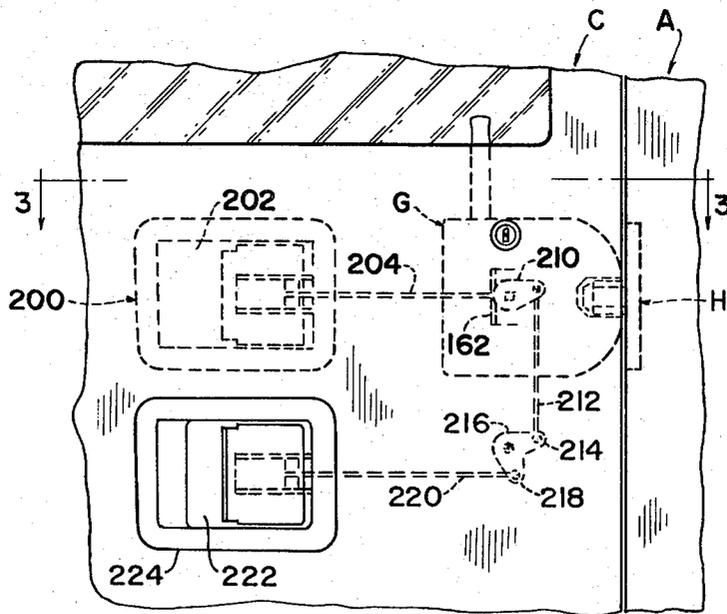


FIG. 2

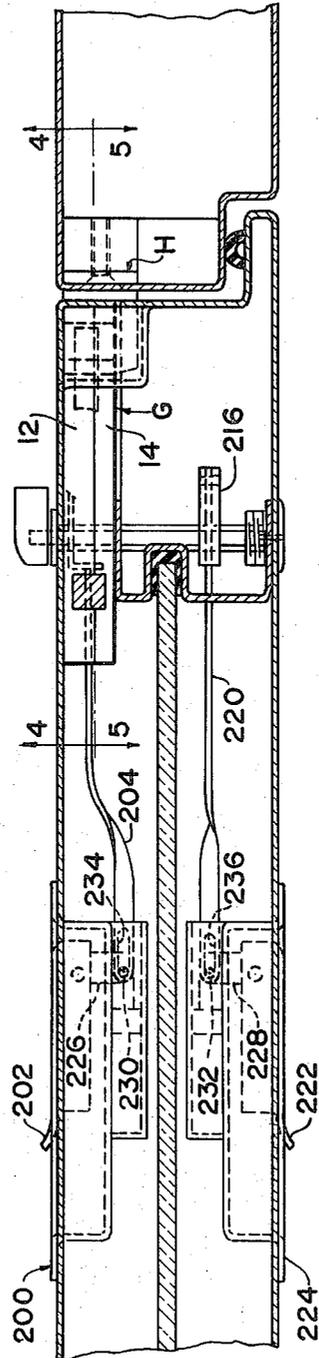


FIG. 3

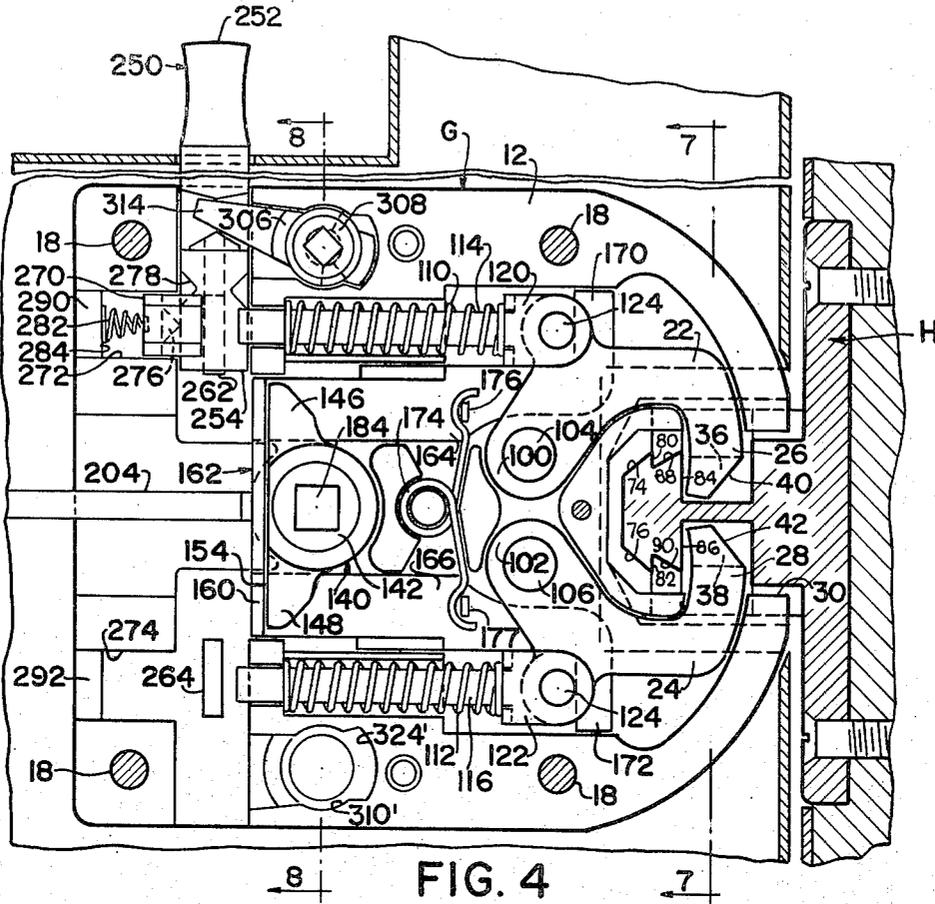


FIG. 4

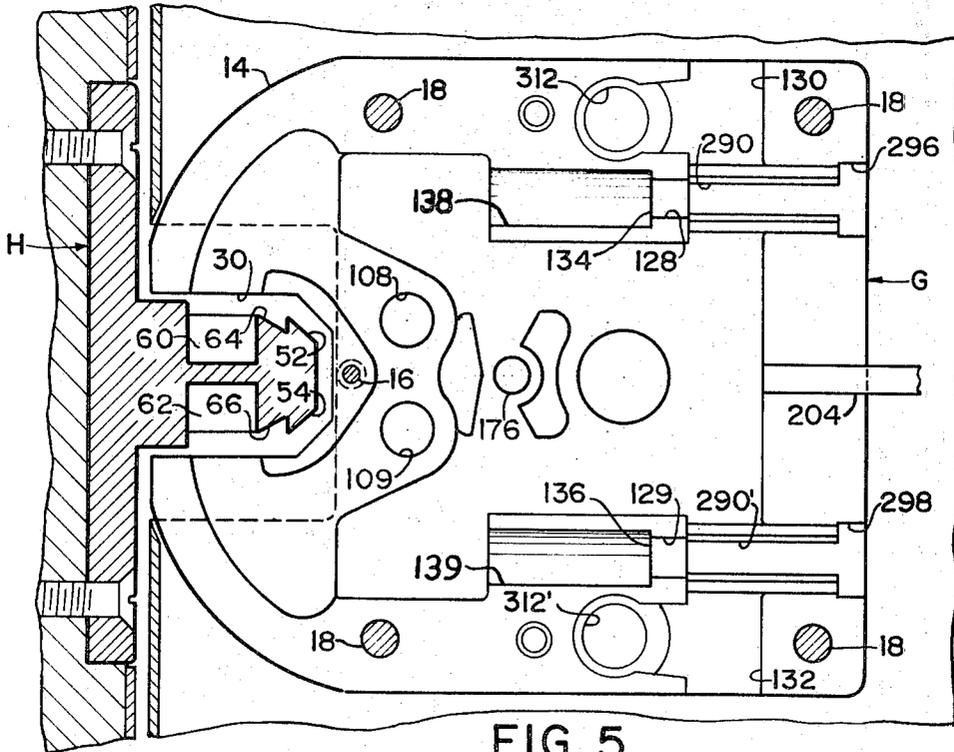


FIG. 5

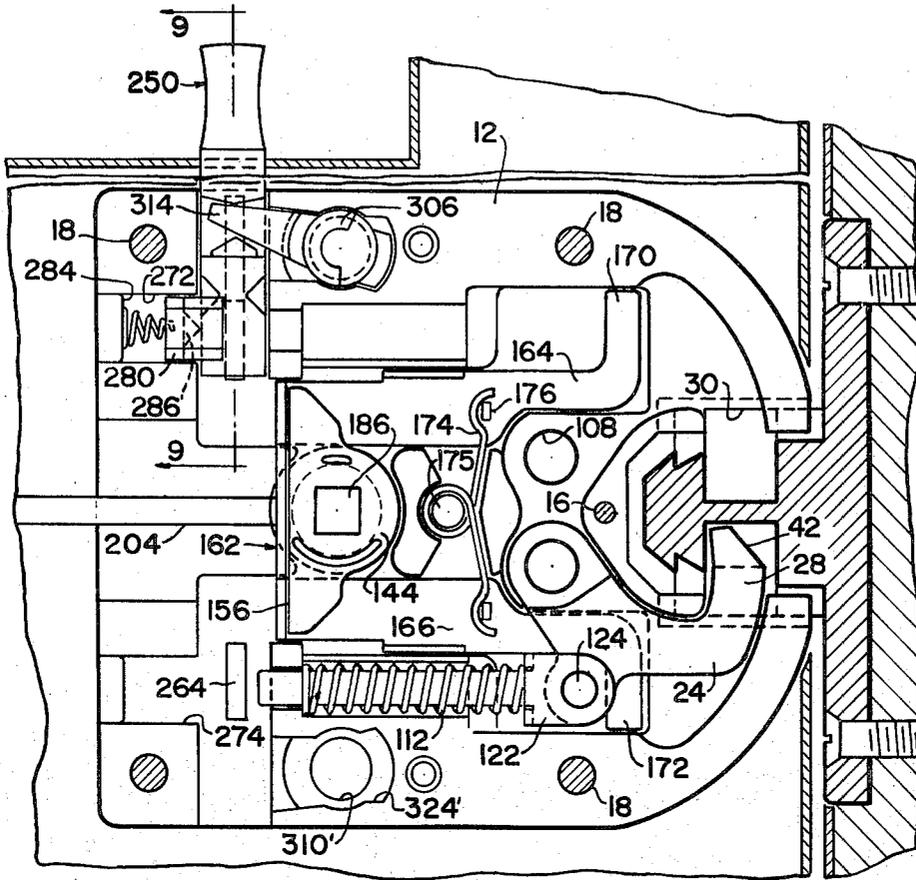


FIG. 6

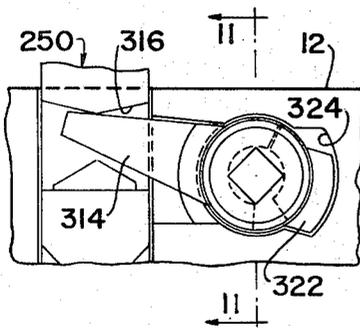


FIG. 10

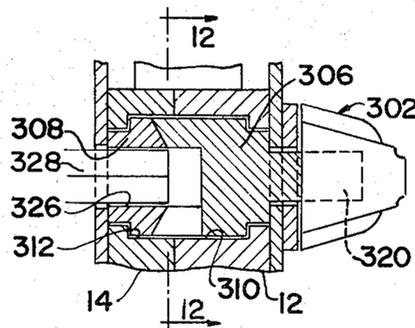


FIG. 11

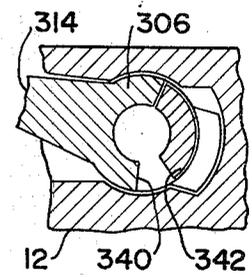


FIG. 12

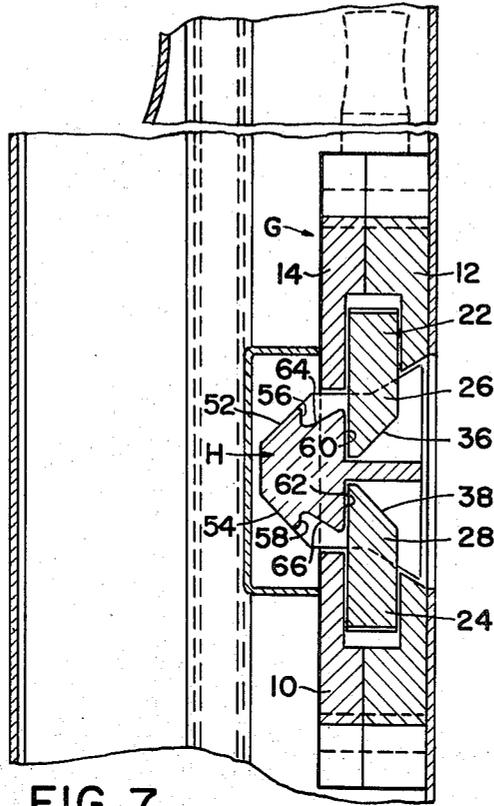


FIG. 7

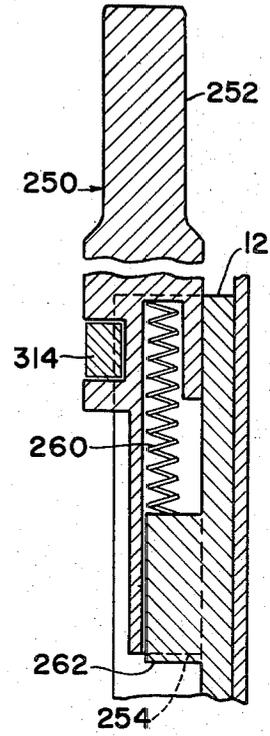


FIG. 9

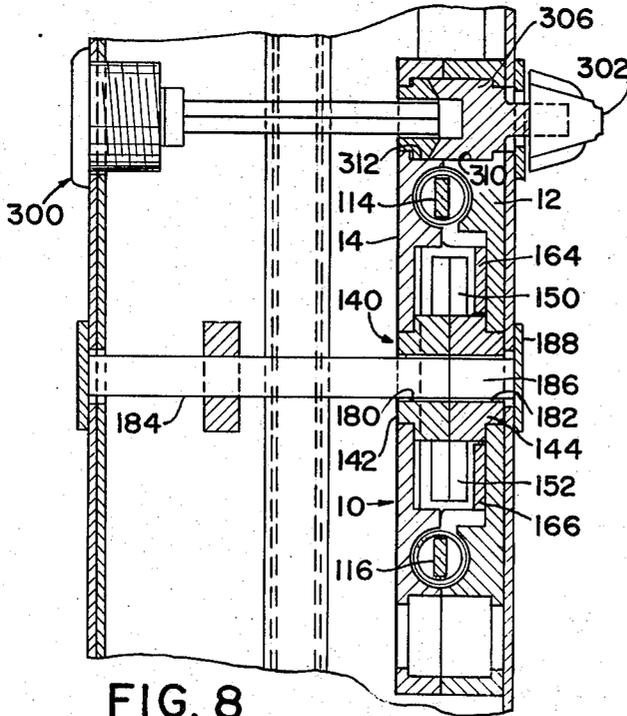


FIG. 8

DOOR LOCK ASSEMBLY

FIELD OF INVENTION

The invention relates to spring-biased, slam, multiple swinging bolt and keeper lock assembly for swinging or sliding doors.

SUMMARY OF INVENTION

The invention provides a new and improved external-internal manipulator-operated, spring-biased, slam, multiple swinging bolt and keeper lock assembly for swinging or sliding doors, either left or right-hand, which is rugged and durable in operation and is especially suitable for use with vehicle doors.

The invention further provides a lock and keeper assembly of the character referred to that can be employed with the doors of all types of vehicles, including passenger automobiles, trucks, off-highway vehicles, etc., and which will meet present safety standards, such as, Federal Motor Vehicle Safety Standard 206.

The invention further provides a lock and keeper assembly of the character referred to which can be readily constructed to operate on closed and/or sliding doors, for operation at the lock position and/or remote therefrom, manually and/or by power, etc.

Further objects and advantages of the present invention will be hereinafter referred to and others will be obvious from the following description of the preferred embodiment.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of a highway vehicle having lock assemblies embodying the invention;

FIG. 2 is an enlarged fragmentary side elevational view of the vehicle shown in FIG. 1;

FIG. 3 is an enlarged sectional view with parts in elevation approximately on the line 3—3 of FIG. 2;

FIG. 4 is an enlarged sectional view with parts in elevation approximately on the line 4—4 of FIG. 3;

FIG. 5 is an enlarged sectional view with parts omitted approximately on the line 5—5 of FIG. 3;

FIG. 6 is a view similar to FIG. 4, with operating parts removed;

FIG. 7 is a sectional view with parts in elevation approximately on the line 7—7 of FIG. 4;

FIG. 8 is a sectional view with parts in elevation approximately on the line 8—8 of FIG. 4;

FIG. 9 is a sectional view with parts in elevation approximately on the line 9—9 of FIG. 6;

FIG. 10 is an enlarged view of a portion of FIG. 6;

FIG. 11 is a sectional view with parts in elevation approximately on the line 11—11 of FIG. 10; and

FIG. 12 is a sectional view approximately on the line 12—12 of FIG. 11.

DESCRIPTION OF PREFERRED EMBODIMENTS

The lock and keeper assembly of the present invention can be used on any swinging or sliding door, but is especially suited for use with vehicle doors and is shown as a part of a van-type truck A having a hinged operator's access door C, and a sliding storage area access door E. The doors C, E, may be of any suitable construction. The edge of the door C towards the front of the vehicle is hinged to the door frame of the vehicle body in a conventional manner and the door E is slidably supported in the vehicle body also in a conven-

tional manner and opens when moved towards the rear of the vehicle.

The lock and keeper assembly, shown, for the hinged door C is designated G-H and comprise the lock, designated G, and the keeper H, and for the sliding door E, G'-H'. The two assemblies are in all essential respects duplicates of one another and merely the assembly used with the door C is shown and described in detail. The orientation or position and/or the direction of movement hereinafter referred to in describing the preferred embodiment are with respect to the vehicle A unless otherwise obvious or referred to.

The lock G is secured within the door C to a suitable support by four bolts 18 and includes a housing 10 comprising the parts 12, 14 normally held together by a screw 16. The housing 10 is generally rectangular in shape and its two part construction permits assembly of the various movable interior parts and provides for replacement of such parts, as required.

A pair of swinging or pivoted latch or bolt members 22, 24 are pivotally supported in the housing 10 with their free or latching ends 26, 28 spring-biased towards one another and projecting from the housing 10 through apertures in the top and bottom walls of a recess 30 in the rear side of the housing 10. The latch members 22, 24 have on the far sides of their distal ends 26, 28, first inclined surface portions 36, 38, converging toward one another and facing in the same axial direction, referring to the pivotal connection of the latch members in the housing 10, and on their rear side, that is, the sides facing away from the pivotal connection of the latch members with the housing 10, second surface portions 40, 42 converging towards one another.

The striker or keeper member H is connected to the door frame of the vehicle and is provided on its rear side, as viewed in FIG. 1, with first inclined surface portions 52, 54, see FIG. 7, converging toward one another. These surfaces face in the direction to be engaged by the first converging surface portions 36, 38 of the latch members 22, 24, when the lock and keeper assembly is used with a swinging door and the door is in the process of being closed. The keeper H is also provided with two pairs of aligned spaced vertical surface portions 56, 58 and 60, 62 spaced toward the right-hand side of the cab from one another by surface portions 64, 66, inclined similar to the surface portions 52, 54. The upper and lower parts of the surface portions 52, 54 terminate at the upper and lower edges of the vertical surface portions 56, 58. The pairs of surface portions 52, 54 and 56, 58 and 64, 66 and 60, 62 form what might be referred to as two ratchet teeth on the upper and lower sides of the keeper H. The construction is such that as the door C is closed the inclined surface portions 36, 38 of the latch members 22, 24 first ride along the inclined surfaces 52, 54 of the keeper member H until they drop and engage behind the first pair of vertical surface portions 56, 58. This holds the door closed in a first or secondary latched position. Upon continued movement of the door in the closing direction the distal ends of the latch members 22, 24 ride up on the inclined surface portions 64, 66 until they drop and engage behind the spaced vertical surface portions 60, 62. With the parts in this position the door is latched in its second fully latched position.

The keeper H is also provided with further converging surface portions 74, 76 facing toward the front of

the vehicle to be engaged by the second converging surface portions 40, 42 on the latch members 22, 24 when the latch and keeper assembly is used with a sliding door and the door is in the process of being closed. The keeper H is also provided with two pairs of aligned spaced vertical surface portions 80, 82 and 84, 86 spaced toward the rear of the vehicle from one another by surface portions 88, 90 inclined similar to the surface portions 74, 76. The upper and lower parts of the surface portions 74, 76 terminate at the upper and lower edges of the vertical surface portions 80, 82. The pairs of surface portions 74, 76, and 80, 82 and 88, 90 and 84, 86 form what might be referred to as two rack teeth on the upper and lower sides of the keeper H facing towards the rear of the vehicle. The construction is such that as the door C is closed the inclined surface portions 40, 42 of the latch members 22, 24 first ride up along the inclined surfaces 74, 76 of the keeper member H until they drop and engage behind the first pair of vertical surface portions 80, 82 thus securing the door in its secondary latch position. Upon continued movement of the door in the closing direction the distal ends of the latch members 22, 24 ride up on the inclined surface portions 88, 90 until they drop and engage behind the spaced vertical surface portions 84, 86 and secure the door in its fully latched position.

The latch members 22, 24 are duplicates of one another and are generally C-shaped, as viewed in side elevation and the forward ends 100, 102 thereof, that is, the ends opposite to the ends 26, 28, are located relatively close to one another and are provided with cylindrical bosses 104, 106, respectively, projecting from opposite sides and received in aligned circular round apertures 108, 109, in the members 12, 14 of the housing 10.

Coil springs 110, 112 surrounding members 114, 116, bias the latch members 22, 24, respectively, for rotation about their pivotal connections with the housing 10 in the direction to move or urge their non-pivoted ends 26, 28 towards one another. The members 114, 116 have enlarged portions 120, 122 at the ends thereof adjacent to the latch members 22, 24, respectively, provided with round apertures through which further cylindrical bosses 124, 126 intermediate the ends of the latch members 22, 24, project. The members 114, 116 extend lengthwise of the vehicle and their forward ends are slidably supported in suitable apertures 128, 129 and project into apertures 132 extending at right angles to the longitudinal horizontal mid-plane of the lock intermediate and parallel with the axes of the latch members 22, 24. The springs 110, 112 are interposed between the enlarged parts 120, 122 of the members 114, 116 and abutment surfaces 134, 136 at the forward ends of pairs of semi-cylindrical channels 138, 139 on the interior of the housing members 12, 14.

The latch members 22, 24 are adapted to be rotated against the bias of the springs 110, 112, to permit opening of a closed door, by a cam 140 supported in the housing 10 for rotation about an axis parallel with the axis of the latch members and in the horizontal mid-plane of the lock. The cam 140 is split vertically providing near and far side parts 142, 144 having oppositely extending portions or lobes 146, 148 and 150, 152, respectively, presenting flat planar front surfaces 154, 156 on the cam parts 142, 144, respectively, normally in engagement with the rear side of a flange 160 on a

member 162 slidably supported in the housing 10 for movement lengthwise of the vehicle. The flange 160 projects at right angles toward the rear side of the vehicle from the front end of spaced elongated flat parts 164, 166 forming parts of the member 162. The rear ends of the parts 164, 166 of the member 162 have extensions 170, 172, respectively, projecting vertically along the rear sides of bosses on the far sides of the latch members 22, 24, similar to and opposite the bosses 124, 126. The member 162 is biased towards the rear of the vehicle by a butterfly-type spring 174 in the housing 10, the center coil of which surrounds a pair of aligned bosses 175 on the housing members 12, 14 and the opposite ends of which engage projections 176, 178 on the parts 164, 166 of the member 162.

The parts 142, 144 of the cam 140, as shown, are provided with square through holes 180, 182 for the reception of one end of square rods or shafts 184, 186. The far shaft 186 is connected to a member 188 secured to the inside of the door C. The member 188 may be extended through the inner side of the door C and provided with a manually operable handle, if desired.

In the preferred embodiment shown, the door C is opened from the interior by a paddle-type lock assembly 200 located at a convenient place in the door C, such as immediately ahead of the lock G, flush with the interior of the door. The assembly 200 is similar to the lock shown in U.S. Pat. No. 3,357,743, less the side bolt assembly, and the paddle handle 202 thereof is connected by a link 204 to the flange 160 of the slide member 162.

The near shaft 184 is rotatably supported in the door C and the near end thereof may be projected through the door C and provided with an operating handle, as desired. In the embodiment shown the shaft 184 is provided with a crank arm 210 within the door operatively connected by a link member 212 to one arm 214 of a bell crank lever 216 also within the door C and pivotally supported therein. The other arm 218 of the bell crank lever 216 is connected by a link member 220 to the paddle handle 222 forming a part of a paddle-type operating assembly 224 located at some convenient place in the door C. The paddle-type lock assembly 224 may be similar to the assembly 200 and mounted flush with the exterior of the door C. The links 204, 220 have lost motion connections with the paddle handles 202, 222. In the embodiment shown the links 204, 220 are connected members 226, 228 operatively connected to or forming parts of the paddle handles 202, 222 by pins 230, 232 fixed to the members 226, 228 and extend through slots 234, 236 in the links 204, 220, respectively. The paddle handle 222 is preferably provided with a key control 238 similar to the key control shown in the aforesaid U.S. Pat. No. 3,357,734. The constructions just described permit operation of the lock G from within and without the vehicle by actuation of the operating paddle handles 202, 222 of the paddle-type lock assemblies 200, 224 without actuating the other handle. Obviously, the two part cam 140 could be made as a single member, if desired, in which event the two shafts 182, 184 would also be formed as a single member.

The lock G thus far described is symmetrical about its horizontal mid-plane and the construction is such that the latch members 22, 24 can be rotated about their pivotal connections in the housing 10 by engagement of their inclined surfaces 36, 38 against the in-

clined surfaces 52, 54 and 64, 66 of the striker member H as upon closing of the swing door C or their inclined surfaces 40, 42 against the inclined surfaces 75, 76 and 88, 90 upon closing of the sliding door E or upon rotation of the cam member 140 in either direction. By rotating the lock and keeper 180° about a horizontal axis the assembly can be used on a door hinged to swing in the opposite direction to the door C shown.

In the embodiment shown, provision is made for selectively preventing retraction of the slide member 162 by the inclusion of a member 250 slidably supported in the aperture 130 in the housing 10 for movement normal to the transverse horizontal mid-plane of the lock. The member 250 projects outwardly of the housing 10 at the top side thereof and forms a hand grasp 252. The opposite inner end 254 of the member 250 is adapted to be selectively positioned behind the flange 160 of the member 162 to prevent its retraction.

The member 250 may be held in one or the other of its two positions, that is, with its inner end 254 outwardly or inwardly of the path of movement of the flange 160 of the member 162 in any suitable desired manner. In the embodiment shown the member 250 is spring-biased to its position clear of the path of movement of the member 162 by a spring 260 interposed between the outer end of the top one of the two projections 262, 264 on the interior of the part 12 of the housing 10 and the bottom of a cylindrical aperture 266 in the member 250 opening into a slot or groove 268 in the fore side of the member 250, as viewed in FIGS. 4 and 6. The member 250 is adapted to be held in its inner position by a spring-pressed detent 270 slidably supported in the upper one of two grooves 272, 274 in the members 12 of the housing 10 for movement transversely of the path of movement of the member 250. The detent member 270 has a V-shaped projection 276 on its underside adapted to be engaged in a suitable aperture 278 in the member 250. As shown, the detent 270 is at the forward side of the member 250, has a portion 280 which overlies the member 250 and is biased towards the member 250 by a spring 282 interposed therebetween an abutment surface 284 on the member 12 of the housing 10. The near side of the detent 270 has a projecting part or rib 286 which engages in a groove 290 in the member 14 of the housing 10 to assist in guiding it in its path of movement. The surface 284 on the housing 10 against which the spring 282 abuts is on the upper of two forwardly extending projections 292, 294 of the member 12 which projects into apertures 296, 298, respectively, in the member 14 of the housing 10. A second aperture similar to the aperture 278 could be provided in the member 250 in position to retain the member 250 in its outmost position, that is, the position shown in the drawings, if desired. In this event the spring 282 could be omitted.

The lock member 250 can also be reciprocated from the exterior of the vehicle by means including a key control, designated generally by the reference character 300. The member 250 can further be reciprocated from within the vehicle by a handlever or control 302. The hand control 302 is intended to be employed when the lock G is so located that it is not convenient to reciprocate the member 250 from above, as is the case with the lock G' mounted in the sliding door E.

For the purpose of reciprocating the member 250 by use of the key control 300, members 306, 308 are coaxially supported for rotation in aligned apertures 310,

312 in members 12 and 14, respectively, of the housing 10. The member 306 includes or is provided with a lever 314 extending forwardly into a groove 316 in the near side of the member 250. The hand control 302 is connected to a square shaft 320 formed integral with the member 306 and projecting through the door C to the interior of the vehicle. Rotation of the member 306 is limited by a projection 322 thereon extending into an elongated arcuate groove 324 in the member 12. If the hand control 302 is to be omitted, obviously the shaft 320 can also be omitted. The member 308 is provided with a square aperture 326 into which one end of a square shaft 328 of the key control 300 is received. The member 308 is operatively connected to the member 306 by a lost motion connection so that the key for the key control 300 can be removed from the control; such controls being typically such that the key can only be inserted and withdrawn except with the rotatable part of the control in a predetermined position.

For the purpose of effecting a lost motion connection between the member 306 and 308, the member 306 is provided with what in effect is an arcuate groove 340 into which an arcuate flange 342 on the far side of the member 308 projects. The flange 342 is sufficiently smaller than the length of the groove 340 to permit rotation of the member 308 a sufficient amount to allow removal of the key from the key control 300 without moving the member 306 after the lock member 250 has been moved to either its locked position, that is, with its lower end 254 of the member 250 in the path of movement of the flange 160 of the slide member 162 or to its unlocked position. In order to facilitate the manufacture and assembly of the apparatus, the abutting surfaces of the members 306, 308 are conical, as shown in the drawings. The member 306 can be rotated to actuate the lock member 250 from a location remote from the lock G, if desired, as by attaching a crank arm thereto connected to a remote control, as by a lever or the like.

As previously mentioned, the preferred embodiment of the invention illustrated can be used with either swinging or sliding doors and the direction in which the door swings or slides is immaterial, as the lock shown is so constructed that the parts can be assembled to accommodate any of the aforementioned suggested doors. For this purpose the upper and lower halves of the parts 12 and 14 of the housing 10 are mirror images of one another, so that parts, such as the pivoted latch members 22, 24, the members 306, 308 and the parts associated therewith, etc., can be reversed and/or moved to the side of the longitudinal horizontal center plane of the lock to accommodate any desired door construction.

Where duplicate parts are shown on the drawings and the second part has not otherwise been identified, they are identified on the drawings with the same reference character but with a prime mark affixed thereto.

While the preferred embodiment of the invention illustrated and described is so constructed that it can be assembled and reassembled for use with swinging and sliding doors, regardless of the direction in which they close, it is to be understood that the invention is not limited to such a construction, but that the lock and keeper assembly of the present invention can be constructed for use with merely one type of door, and if desired, for a door opening only in one specific direction.

From the foregoing it will be apparent that the objects heretofore enumerated and others have been accomplished and that there has been provided a novel and improved lock and keeper assembly, and it is the invention to hereby cover all adaptations, modifications and use of the lock shown and described which come within the practice of those skilled in the art and the scope of the appended claims.

Having thus described my invention, what I claim is:

1. A lock assembly comprising: a multi-part housing having apertures, grooves and channels therein supporting operating parts; a pair of latch members in one of said cavities and pivoted to said housing about spaced parallel axes; said latch members having opposed jaw parts spring-biased towards one another projecting from said housing, said jaw parts having on one side of their distal ends surface portions converging toward one another and facing in the same direction axially of the pivot axes; a member slidably supported within said housing and operably connected to said latch members for moving said latch members about their pivoted connection to said housing in the direction to move said jaw parts away from one another; and a keeper member adapted to be engaged by said jaw parts, said keeper member having surface portions converging towards one another facing in one direction to be engaged by said converging surface portions of said jaw parts and aligned surface portions spaced from said converging surface portions and facing in the opposite direction.

2. A lock assembly comprising: a multi-part housing; a pair of latch members pivoted to said housing about spaced parallel axes and having opposed jaw parts spring-biased towards one another projecting said housing, said jaw parts having on one side of their distal ends surface portions converging toward one another and facing in the same direction axially of the pivot axes; a member within said housing operably connected to said latch members for moving said latch members about their pivoted connection to said housing in the direction to move said jaw parts away from one another; and a keeper member adapted to be engaged by said jaw parts, said keeper member having surface portions converging towards one another facing in one direction to be engaged by said converging surface portions of said jaw parts and two pairs of aligned surface portions spaced from one another and from said converging surface portions and facing in the opposite direction.

3. A lock assembly comprising: a multi-part housing; a pair of latch members pivoted to said housing about spaced parallel axes and having opposed jaw parts spring-biased towards one another projecting from said housing, said jaw parts having on one side of their distal ends surface portions converging toward one another and facing in the same direction axially of the pivot axes; a member slidably supported within said housing and operably connected to said latch members for moving said latch members about their pivoted connection to said housing in the direction to move said jaw parts away from one another; means in said housing for moving said member in the direction to move said jaw parts away from one another; locking means selectively movable into and out of the path of movement of said member; and a keeper member adapted to be engaged by said jaw parts, said keeper member having surface portions converging towards one another facing in one

direction to be engaged by said converging surface portions of said jaw parts and aligned surface portions spaced from said converging surface portions and facing in the opposite direction.

4. A lock assembly comprising: a multi-part housing; a pair of latch members pivoted to said housing about spaced parallel axes and having opposed jaw parts spring-biased towards one another projecting from said housing, jaw parts having on one side of their distal ends surface portions converging toward one another and facing in the same direction axially of the pivot axes; a member within said housing operably connected to said latch members for moving said latch members about their pivoted connection to said housing in the direction to move said jaw parts away from one another; means in said housing for moving said member in the direction to move said jaw parts away from one another; locking means selectively movable into and out of the path of movement of said member; and a keeper member adapted to be engaged by said jaw parts, said keeper member having surface portions converging towards one another facing in one direction to be engaged by said converging surface portions of said jaw parts and two pairs of aligned surface portions spaced from one another and from said converging surface portions and facing in the opposite direction.

5. A lock assembly comprising: a multipart housing; a pair of latch members pivoted to said housing about spaced parallel axes and having opposed jaw parts spring-biased towards one another projecting from said housing, said jaw parts having on one side of their distal ends surface portions converging toward one another and facing in the same direction axially of the pivot axes; a member slidably supported within said housing and operably connected to said latch members for moving said latch members about their pivoted connection to said housing in the direction to move said jaw parts away from one another; cam means rotatably supported in said housing for moving said member in the direction to move said jaw parts away from one another; locking means selectively movable into and out of the path of movement of said member; and a keeper member adapted to be engaged by said jaw parts, said keeper member having surface portions converging towards one another facing in one direction to be engaged by said converging surface portions of said jaw parts and aligned surface portions spaced from said converging surface portions and facing in the opposite direction.

6. A lock assembly comprising: a multi-part housing; a pair of latch members pivoted to said housing about spaced parallel axes and having opposed jaw parts spring-biased towards one another projecting from said housing, jaw parts having on one side of their distal ends surface portions converging toward one another and facing in the same direction axially of the pivot axes; a member within said housing operably connected to said latch members for moving said latch members about their pivoted connection to said housing in the direction to move said jaw parts away from one another; cam means rotatably supported in said housing for moving said member in the direction to move said jaw parts away from one another; locking means selectively movable into and out of the path of movement of said member; and a keeper member adapted to be engaged by said jaw parts, said keeper member having surface portions converging towards

one another facing in one direction to be engaged by said converging surface portions of said jaw parts and two pairs of aligned surface portions spaced from one another and from said converging surface portions and facing in the opposite direction.

7. A lock assembly comprising: a multi-part housing; a pair of latch members pivoted to said housing about spaced parallel axes and having opposed jaw parts projecting from said housing, said jaw parts having on their distal ends surface portions converging towards one another and facing in the same direction axially of the pivot axes; two spring retainers, each connected to one of said jaw parts at locations spaced from the jaw pivots; two compression springs, each acting between the housing and one of said spring retainers, directly urging said opposed jaw parts toward one another; a member slidably supported within said housing and operably connected to said latch members through a lost-motion connection for moving said latch members about their pivoted connection to said housing in the direction to move said jaw parts away from one another; means in said housing for moving said member in the direction to move said jaw parts away from one another; locking means selectively movable into and out of the path of movement of said member; a striker member adapted to be engaged by said jaw parts, said striker member having surface portions converging towards one another facing in one direction to be engaged by said converging surface portions of said jaw parts and aligned surface portions spaced from said converging surface portions and facing in the opposite direction.

8. A lock assembly comprising: a multi-part housing; a pair of latch members pivoted to said housing about spaced parallel axes and having opposed jaw parts projecting from said housing, said jaw portions having on one side of their distal ends surface portions converging towards one another and facing in the same direction axially of the pivot axes; two spring retainers, each connected to one of said jaw parts at locations spaced from the jaw pivots; two compression springs, each acting between the housing and one of said spring retainers, directly urging said opposed jaw parts toward one another; a member within said housing operably connected to said latch members through a lost-motion connection for moving said latch members about their pivoted connection to said housing in the direction to move said jaw parts away from one another; means in said housing for moving said member in the direction to move said jaw parts away from one another; locking means selectively movable into and out of the path of movement of said member; a striker member adapted to be engaged by said jaw parts, said striker member having surface portions converging towards one another facing in one direction to be engaged by said converging surface portions of said jaw parts and two pairs of aligned surface portions spaced from one another and from said converging surface portions and facing in the opposite direction.

9. A lock assembly comprising: a multi-part housing; a pair of latch members pivoted to said housing about spaced parallel axes and having opposed jaw parts projecting from said housing, said jaw parts having on their distal ends surface portions converging towards one another and facing in the same direction axially of the pivot axes; two spring retainers, each connected to one of said jaw parts at locations spaced from the jaw pivots, two compression springs, each acting between the

housing and one of said spring retainers, directly urging said opposed jaw parts toward one another; a member slidably supported within said housing and operably connected to said latch members through a lost-motion connection for moving said latch members about their pivoted connection to said housing in the direction to move said jaw parts away from one another; cam means rotatably supported in said housing for moving said member in the direction to move said jaw parts away from one another; locking means selectively movable into and out of the path of movement of said member; a striker member adapted to be engaged by said jaw parts, said striker member having surface portions converging towards one another facing in one direction to be engaged by said converging surface portions of said jaw parts and aligned surface portions spaced from said converging surface portions and facing in the opposite direction.

10. A lock assembly comprising: a multi-part housing; a pair of latch members pivoted to said housing about spaced parallel axes and having opposed jaw parts projecting from said housing, said jaw portions having on one side of their distal ends surface portions converging towards one another and facing in the same direction axially of the pivot axes; two spring retainers, each connected to one of said jaw parts at locations spaced from the jaw pivots; two compression springs, each acting between the housing and one of said spring retainers, directly urging said opposed jaw parts toward one another; a member within said housing operably connected to said latch members through a lost-motion connection for moving said latch members about their pivoted connection to said housing in the direction to move said jaw parts away from one another; cam means rotatably supported in said housing for moving said member in the direction to move said jaw parts away from one another; locking means selectively movable into and out of the path of movement of said member; a striker member adapted to be engaged by said jaw parts, said striker member having surface portions converging towards one another facing in one direction to be engaged by said converging surface portions of said jaw parts and two pairs of aligned surface portions spaced from one another and facing in the opposite direction.

11. A lock assembly comprising: a multi-part housing; a pair of latch members pivoted to said housing about spaced parallel axes and having opposed jaw parts spring-biased towards one another projecting from said housing, said jaw parts having on one side of their distal ends first surface portions converging toward one another and facing in the same direction axially of the pivot axes, and on the sides facing away from the axes of pivotal connection of said latch members second surface portions converging towards one another; a member within said housing operably connected to said latch members for moving said latch members about their pivotal connection to said housing in the direction to move said jaw parts away from one another; a striker member adapted to be engaged by the jaw parts, said striker member having first surface portions converging towards one another facing in one direction to be engaged by said first converging surface portions of said jaw parts and aligned surface portions spaced from said first converging surface portions and facing in the opposite direction, and said striker member also having second surface portions converging to-

wards one another facing in one direction to be engaged by said second converging surface portions on said jaw parts and a pair of aligned surface portions spaced from said second converging surface portions and facing in the opposite direction.

12. A lock assembly comprising: a multi-part housing; a pair of latch members pivoted to said housing about spaced parallel axes and having opposed jaw parts spring-biased towards one another projecting from said housing, said jaw parts having on one side of their distal ends first surface portions converging toward one another and facing in the same direction axially of the pivot axes, and on the sides facing away from the axes of pivotal connection of said latch members second surface portions converging towards one another; a member within said housing operably connected to said latch members for moving said latch members about their pivoted connection to said housing in the direction to move said jaw parts away from one another; a striker member adapted to be engaged by said jaw parts, said striker member having first surface portions converging towards one another facing in one direction to be engaged by said first converging surface portions of said jaw parts and two pair of aligned surface portions spaced from one another and from said first converging surface portions and facing in the opposite direction, and said striker member also having second surface portions converging towards one another facing in one direction to be engaged by said second converging surface portions on said jaw parts and a pair of aligned surface portions spaced from said second converging surface portions and facing in the opposite direction.

13. A lock assembly comprising: a multi-part housing; a pair of latch members pivoted to said housing about spaced parallel axes and having opposed jaw parts projecting from said housing, said jaw parts having on their distal ends surface portions converging towards one another and facing in the same direction axially of the pivot axes; two spring retainers, each pivoted to one of said jaw parts at locations spaced from the jaw pivots and reciprocable within the housing; two coil compression springs, each surrounding one of said spring retainers along the length of the spring to retain alignment and each acting between the housing and the surrounded spring retainer, directly urging said opposed jaw parts toward one another; a member within said housing operably connected to said latch members through a lost-motion connection for moving said latch members about their pivoted connection to said housing in the direction to move said jaw parts away from one another; means in said housing for moving said member in the direction to move said jaw parts away from one another; means to selectively prevent said jaw parts from being moved away from one another by said member; a striker member adapted to be engaged by said jaw parts, said striker member having surface portions converging towards one another facing in one direction to be engaged by said converging surface portions of said jaw parts and aligned surface portions spaced from said converging portions and facing in the opposite directions.

14. A lock assembly comprising: a multi-part housing; a pair of latch members pivoted to said housing about spaced parallel axes and having opposed jaw parts projecting from said housing, said jaw portions having on one side of their distal ends surface portions

converging towards one another and facing in the same direction axially of the pivot axes; two spring retainers, each pivoted to one of said jaw parts at locations spaced from the jaw pivots and reciprocable within the housing; two coil compression springs, each surrounding one of said spring retainers along the length of the spring to retain alignment and each acting between the housing and the surrounded spring retainer, directly urging said opposed jaw parts toward one another; a member within said housing operably connected to said latch members through a lost-motion connection for moving said latch members about their pivoted connection to said housing in the direction to move said jaw parts away from one another; means in said housing for moving said member in the direction to move said jaw parts away from one another; means to selectively prevent said jaw parts from being moved away from one another by said member; a striker member adapted to be engaged by said jaw parts, said striker member having surface portions converging towards one another facing in one direction to be engaged by said converging surface portions of said jaw parts and two pairs of aligned surface portions spaced from one another and from said converging surface portions and facing in the opposite direction.

15. A lock and keeper assembly for securing a door relative to a door frame in two substantially mutually perpendicular directions; said lock assembly comprising a multi-part housing, a pair of latch members pivoted relative to the housing about spaced parallel axes and having opposed jaw parts projecting from said housing and spring-biased toward one another, surface portions on distal ends of the jaw parts including one portion on each facing in a common direction axially of the pivot axes and converging towards one another, and a member within said housing operably associated with said latch members for pivotally moving said latch members in directions to move said jaw parts away from one another; and a keeper adapted to be engaged by said jaw parts, said keeper having first surface portions converging towards one another facing in one direction to be engaged by said converging surface portions of said jaw parts, second surface portions spaced from said converging surface portions and facing in the opposite direction to be engaged by surface portions of said jaw parts facing oppositely from the converging portions, and third surface portions transverse to said second surface portions and opposed to said jaw parts when the jaw parts engage said second surface portions; whereby the said second and third surface portions of the keeper restrain relative movement of the lock assembly in two substantially mutually perpendicular directions.

16. A lock and keeper assembly for securing a door relative to a door frame in two substantially mutually perpendicular directions; said lock assembly comprising a multi-part housing, a pair of latch members pivoted relative to the housing and having opposed jaw parts projecting from said housing and spring-biased toward one another, surface portions on distal ends of the jaw parts including first portions on each facing in a first common direction and converging towards one another, and second portions on each facing in a second common direction at right angles to the said first common direction and converging toward one another, and a member within said housing operably associated with said latch members for pivotally moving said latch

members in directions to move said jaw parts away from one another; and a keeper adapted to be engaged by said jaw parts, said keeper having first surface portions converging towards one another facing in one direction to be engaged by said first converging surface portions of said jaw parts, second surface portions spaced from said converging surface portions and facing in the opposite direction to be engaged by surface portions of said jaw parts facing oppositely from said first common direction, third surface portions converging towards one another facing in a direction at right angles to the direction of the first converging surface portions to be engaged by said second converging surface portions of said jaw parts, and fourth surface portions spaced from said converging third surface portions, facing in the opposite direction therefrom and transverse to said second surface portions to be engaged by surface portions of said jaw parts facing oppositely from said second common direction; whereby the lock can be engaged with the keeper through relative movement in either of two transverse directions and the jaw parts, through engagement with the second and fourth surface portions of the keeper, restrain the lock assembly from movement relative to the keeper in two mutually perpendicular directions.

17. A lock and keeper assembly for securing a door relative to a door frame in two substantially mutually perpendicular directions; said lock assembly comprising a multi-part housing, an opening in the housing for receiving a keeper, said opening having two opposed

edge surfaces that converge in at least one of said mutually perpendicular directions, a pair of latch members pivoted relative to the housing and having opposed jaw parts projecting into said opening from said housing and spring-biased toward one another, surface portions on distal ends of the jaw parts including one portion on each facing in a common direction and converging towards one another, and a member within said housing operably associated with said latch members for pivotally moving said latch members in directions to move said jaw parts away from one another; and a keeper adapted to be engaged by said jaw parts, said keeper having first surface portions converging towards one another facing in one direction to be engaged by said converging surface portions of said jaw parts, second surface portions spaced from said converging surface portions and facing in the opposite direction to be engaged by surface portions of said jaw parts facing oppositely from the converging portions, third surface portions transverse to said second surface portions and opposed to said jaw parts when the jaw parts engage said second surface portions, and fourth surface portions that converge in the direction of said opposed edge surfaces of the lock assembly and that are engageable therewith to align the lock assembly and keeper; whereby upon interengagement of the lock assembly and keeper the second and third surface portions the keeper restrain relative movement of the lock assembly in two substantially mutually perpendicular directions.

* * * * *

35

40

45

50

55

60

65