May 14, 1940. M. A. LEVY ET AL 2,200,627

SAFETY DOOR CHECK CONSTRUCTION

Filed April 8, 1938 4 Sheets-Sheet 1

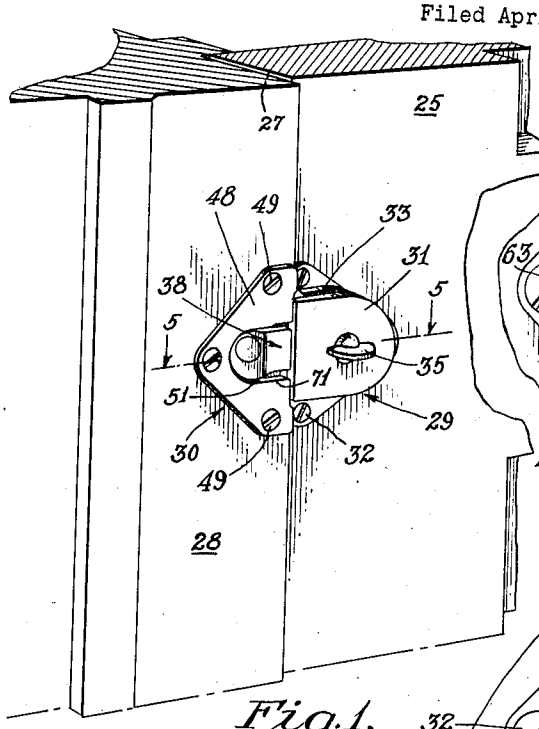


Fig. 1.

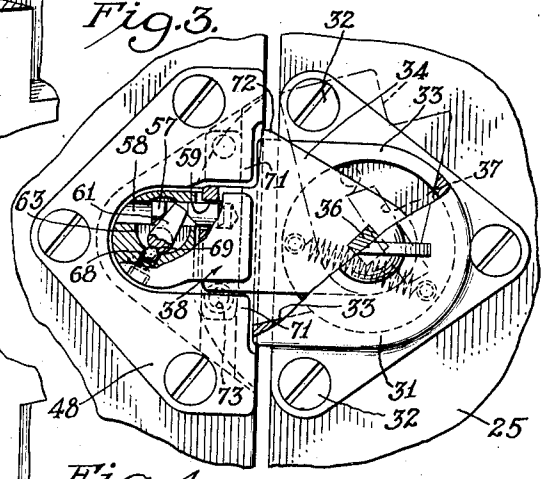


Fig. 3.

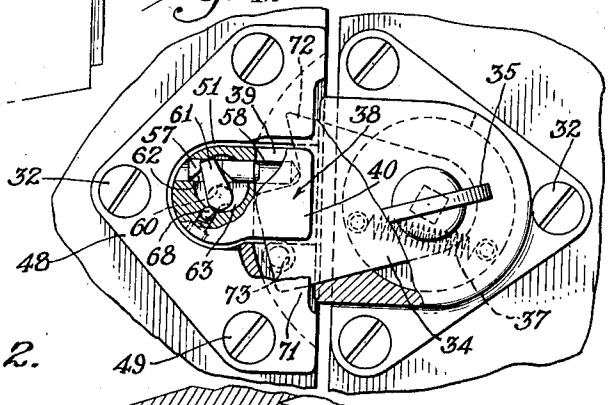


Fig. 4.

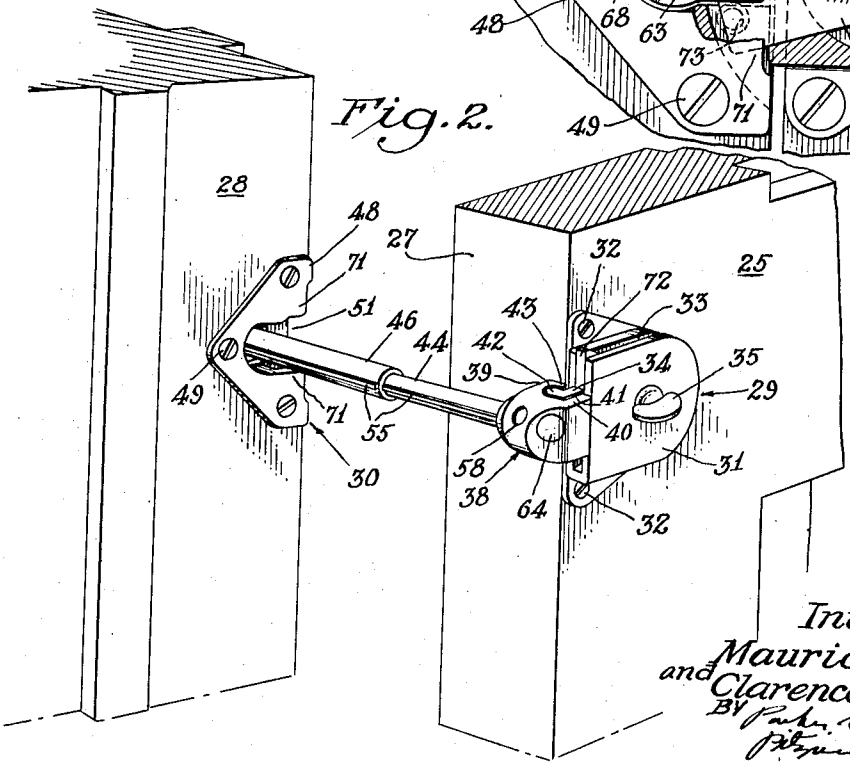


Fig. 2.

Inventors
Maurice A. Levy
and Clarence E. Smith
BY Parker, Carlson, Watson & Hubbard.
Attorneys.

May 14, 1940. M. A. LEVY ET AL 2,200,627

SAFETY DOOR CHECK CONSTRUCTION

Filed April 8, 1938 4 Sheets-Sheet 2

Fig. 5.

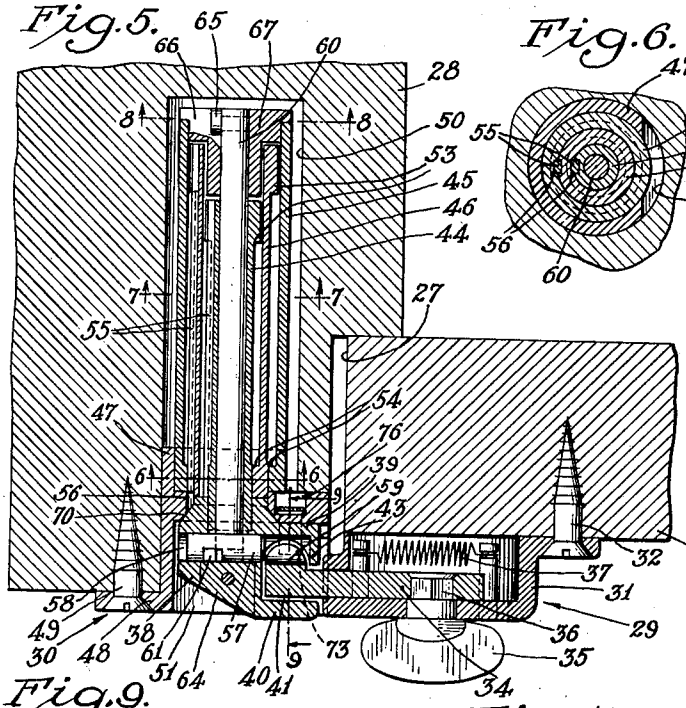


Fig. 6.

Fig. 8.

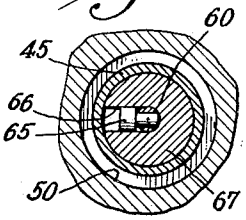


Fig. 7.

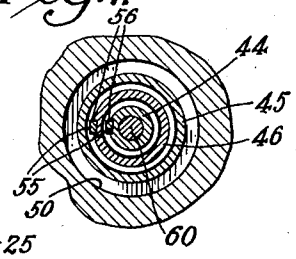


Fig. 9.

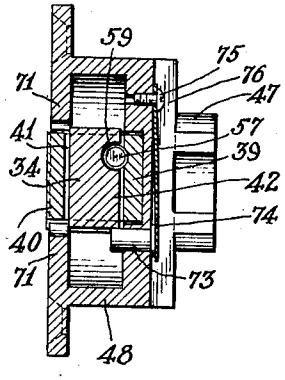


Fig. 10.

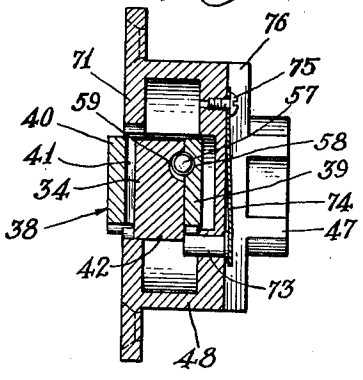


Fig. 11.

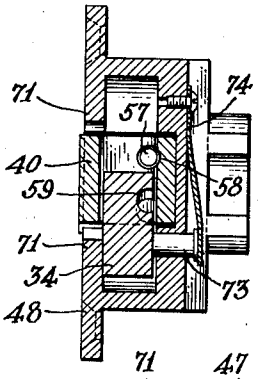
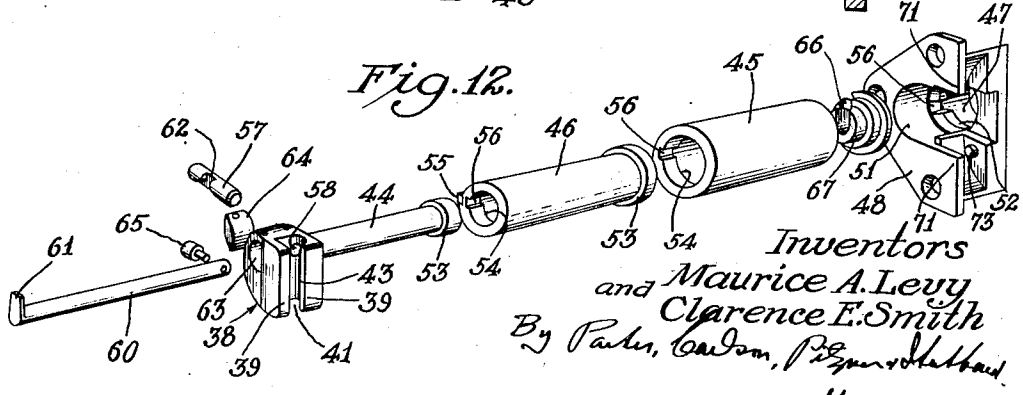


Fig. 12.



Inventors
and Maurice A. Levy
Clarence E. Smith
By Parker, Carlson, Pierce & Hubbard
Attorneys.

May 14, 1940. M. A. LEVY ET AL 2,200,627

SAFETY DOOR CHECK CONSTRUCTION

Filed April 8, 1938 4 Sheets-Sheet 3

Fig. 13.

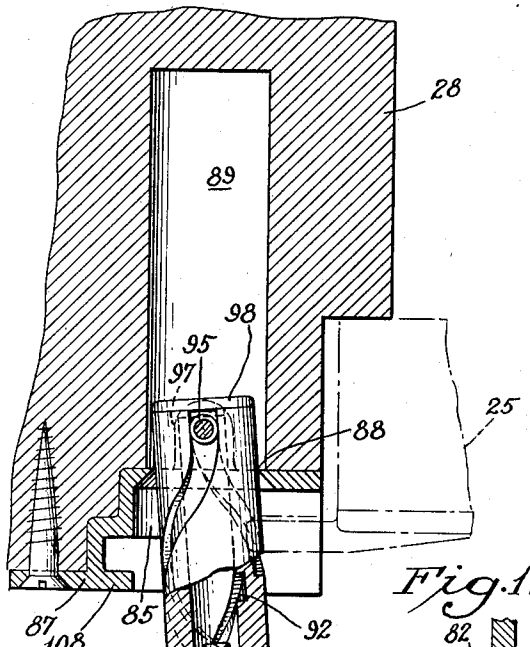


Fig. 14.

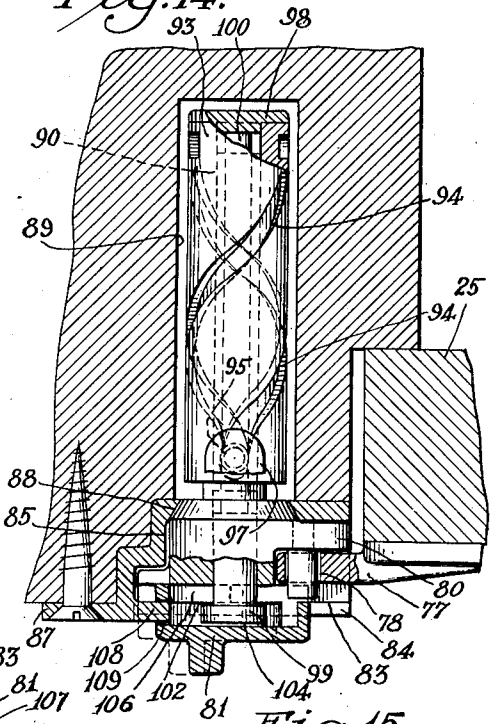


Fig. 17.

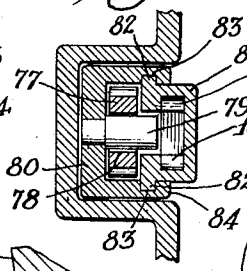


Fig. 15.

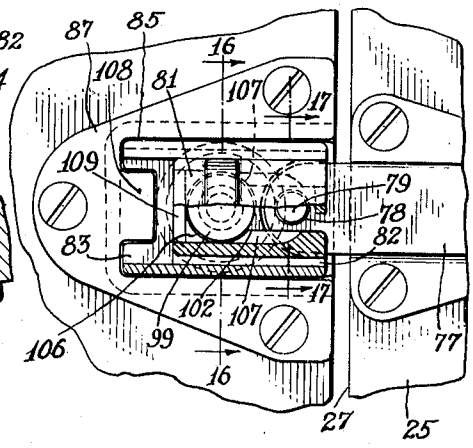
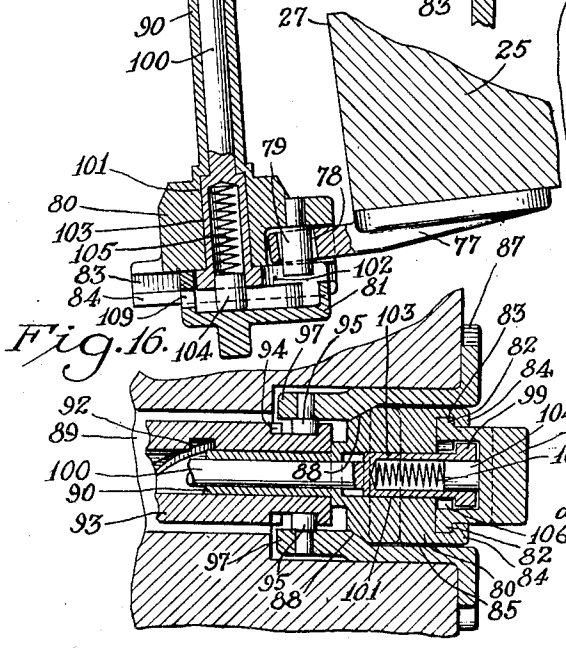


Fig. 16.



Inventors
Maurice A. Levy
and Clarence E. Smith
BY
Parker, Carlton, Pilger & Hubbard
Attorneys.

May 14, 1940. M. A. LEVY ET AL 2,200,627

SAFETY DOOR CHECK CONSTRUCTION

Filed April 8, 1938 4 Sheets-Sheet 4

Fig. 18.

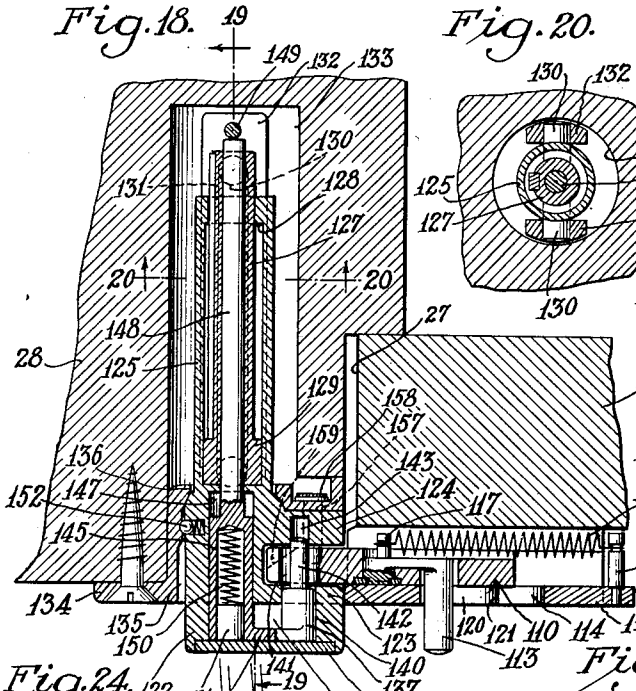


Fig. 20.

Fig. 19.

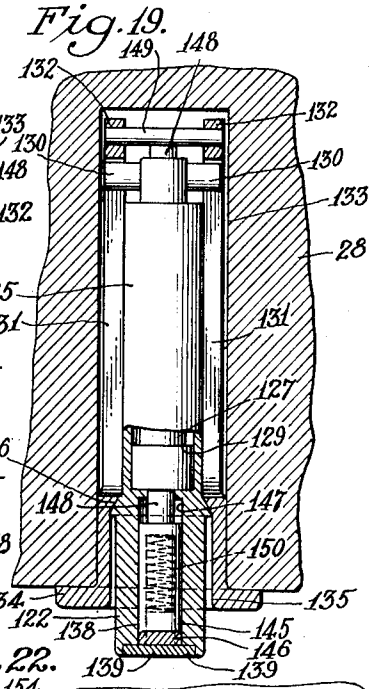


Fig. 24.

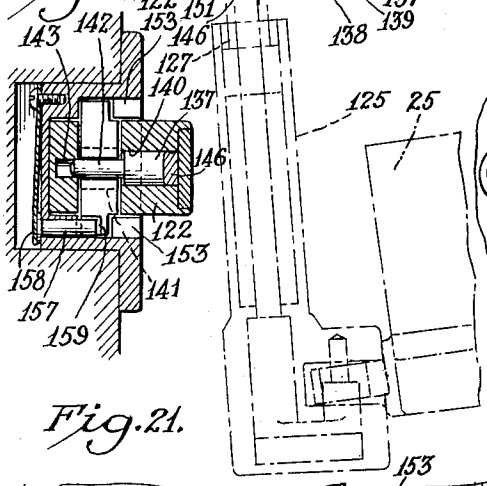


Fig. 22.

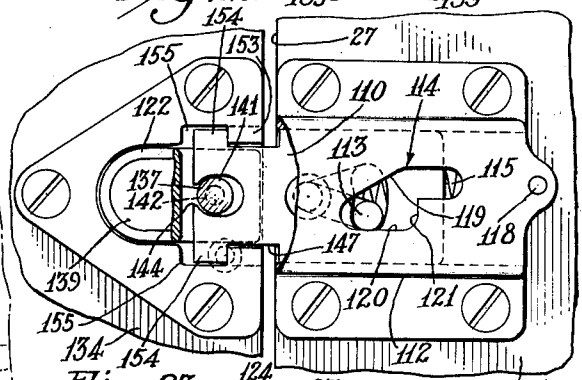


Fig. 23.

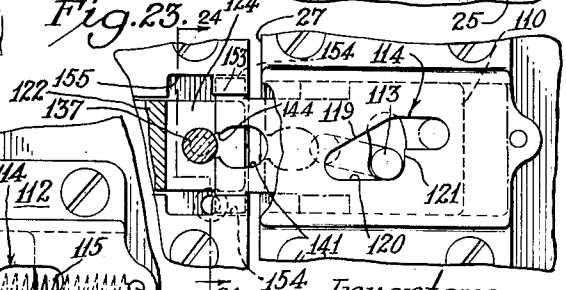
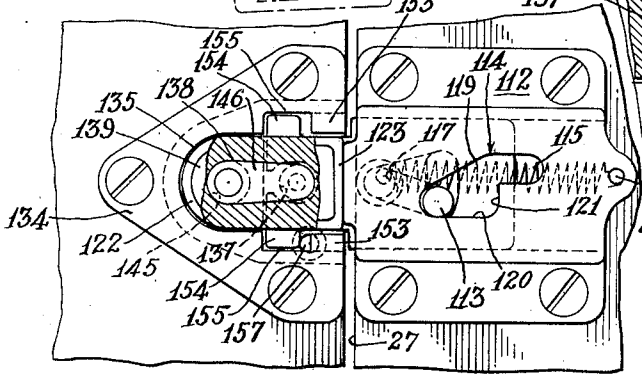


Fig. 21.



Inventors
Maurice A. Levy
and
Clarence E. Smith
BY
Attorneys.

Patented May 14, 1940

2,200,627

UNITED STATES PATENT OFFICE

2,200,627

SAFETY DOOR CHECK CONSTRUCTION

Maurice A. Levy and Clarence E. Smith, Chicago, Ill.; said Smith assignor to said Levy

Application April 8, 1938, Serial No. 200,859

22 Claims. (Cl. 292—262)

This invention concerns improvements in safety door checks which are adapted for positively limiting the opening movement of a residence door, so that although the door may be opened slightly for ventilation or to enable a person within the residence to observe and communicate directly with someone outside, yet the door will be held effectually as a barrier to intrusion.

A general object of the invention is to provide an efficient, sturdy door check construction of relatively small, compact form which may be manufactured at low cost, which can be installed easily and without intricate fitting operations, and which will lie as nearly flush with the door jamb as practicable and without objectionable protruding parts.

Another object resides in the provision of a door check which will telescope into the door jamb adjacent to the edge of and transversely of the closed plane of the associated door, and which will move in an axial path toward and from the checked position of the door, adequate allowance being made, of course, for the deflection necessary in following the adjacent door edge as it swings open.

Another object is to provide an improved door check construction in which a simple one-hand manipulation will effect interengagement between the check mechanism and the engagement means on the door; and in which, after such interengagement, the opening movement of the door will automatically effect an interlock between the check mechanism and the engagement means, the interlock mechanism being wholly inaccessible so that it cannot be tampered with or disconnected and being automatically releasable when the door is closed.

Another object is to provide a novel safety door check construction which will serve also as a night latch.

Another object is to provide a safety door check of this character in which the night latch becomes automatically effective as an incident to returning the door from its checked position.

Other objects and advantages will become apparent in the following description and from the accompanying drawings in which:

Figure 1 is a fragmentary perspective view partly in section of a closed door and its associated jamb showing thereon one preferred form of door check construction embodying the invention.

Fig. 2 is a fragmentary perspective view similar to Fig. 1 but showing the door in its checked open position.

Figs. 3 and 4 are full size elevational views of the device, partly in section and showing certain parts thereof in different operative positions.

Fig. 5 is a transverse sectional view taken substantially along line 5—5 of Fig. 1, but on a larger scale.

Figs. 6, 7 and 8 are sectional detail views taken substantially along lines 6—6, 7—7 and 8—8, respectively, of Fig. 5.

Fig. 9 is a sectional detail view of the device taken substantially in the plane of line 9—9 of Fig. 5.

Figs. 10 and 11 are views similar to Fig. 9 but showing certain parts in different relative positions.

Fig. 12 is a perspective assembly view showing the various parts of the keeper assembly of the device on a reduced scale.

Fig. 13 is a full size longitudinal sectional view of a modified form of the invention.

Fig. 14 is a view similar to Fig. 13 but showing various parts of the device in other positions.

Fig. 15 is a front elevational view, partially in section of the device shown in Figs. 13 and 14.

Figs. 16 and 17 are sectional detail views taken approximately along lines 16—16 and 17—17, respectively, of Fig. 15.

Fig. 18 is a full size longitudinal sectional view of another modified form of the invention.

Figs. 19 and 20 are sectional detail views taken substantially along lines 19—19 and 20—20 of Fig. 18.

Fig. 21 is a front elevational view, partly in section, of the device shown in Fig. 18.

Figs. 22 and 23 are partly sectional front elevational views similar to Fig. 21 but showing certain parts in different relative positions.

Fig. 24 is a sectional detail view taken substantially along line 24—24 of Fig. 23.

While the invention is susceptible of various modifications and alternative constructions, we have shown in the drawings and will herein describe in detail, certain preferred embodiments, but it is to be understood that we do not thereby intend to limit the invention to the specific forms disclosed, but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

Our door check is constructed in two cooperative, separable units, namely, an engagement unit which is adapted to be fixedly secured at the inside of the vertically swinging edge of a door; and a keeper unit which is adapted to be secured to the door jamb. The keeper unit includes

check means which is constructed to be interlocked with the engagement unit to check the door positively in a partially opened position. In the checked position it is impossible to disconnect the two units because the interlocking means is effectively concealed and cannot be reached by tampering instruments. To release the units it is necessary to close the door fully, thus reserving for the discretion of the person on the inside the matter of admitting an outsider. As an additional safety feature, the door check may be constructed to serve also as a night latch.

For the sake of convenience and a better understanding of their operation, all forms of the invention illustrated will be referred to in association with a conventional door 25 which has a vertical swinging edge 27 that coacts with a door jamb 28 of any preferred construction.

Referring now to Figs. 1 to 12 of the drawings, which show one preferred embodiment of the invention, an engagement unit 29 is secured to the inside face of the door adjacent to the vertical, swinging edge 27 so as to be coactive with a keeper unit 30 which is mounted on the door jamb 28. As shown in Fig. 2, the engagement unit 29 and the keeper unit 30 may be interengaged to check the door 25 at a predetermined partially open position. Thereby enough clearance will be afforded for ventilation purposes or for convenient direct conversation between persons on opposite sides of the door, but the door will still effectively bar entrance to the person outside. Due to the limited clearance between the jamb and the door in the checked position of the latter (in practice about two to two and one-half inches), the person outside the door cannot practically insert a foot between the door and jamb nor reach any distance into the room.

The engagement unit 29 may be of any preferred construction, herein including a housing 31 which may be secured to the door 25 in any suitable manner such as by means of screws 32. Projecting through a substantially radial slot 33 in the housing 31 in a plane substantially parallel to that of the door 25, is an engagement member, here in the form of a flattened, pivoted latch 34 which is adapted to extend beyond the door edge 27 to coact with the keeper unit 30 (Figs. 2 to 5, inclusive). The latch 34 may be swung into and out of operative position by manipulation of a suitable knob or handle 35 which has a connecting shank 36 that serves as the pivot of the latch. When the door is to be opened without restraint, the latch 34 is swung free of the keeper unit 30 into a position within the plane of the door edge 27, as shown in broken outline in Fig. 3. An off-center tension spring 37 will hold the latch in this position.

To render the door check operative, the latch 34 is swung from its free position to a substantially horizontal position, while the door is closed, to engage with a keeper head 38 which forms part of the keeper unit 30 (Figs. 2, 3 and 5). For this purpose the head 38 has a pair of opposed inner and outer abutments 39 and 40, respectively, which define a suitably proportioned mouth 41 for receiving the end of the latch 34. A bead 42 on the latch 34 coacts with a lip 43 on the inner abutment 39 to prevent the head and latch from being jimmied or pried apart.

The head 38 is supported for movement to and from door checking position by suitable mechanism which is constructed to project reciprocably or telescopically into the door jamb 28. In the present instance the checking mechanism includes a plurality of elongated, coaxially telescoping tubes comprising an inner tube 44, a retaining tube 45 and an intermediate connecting or extension tube 46. The inner tube 44 is rigidly connected as a stem to the head 38 and the retaining tube 45 is rigidly supported by a projecting annular flange 47 forming part of a keeper body 48. The latter is fixedly secured as by means of screws 49 over the mouth of a suitable, elongated bore 50 which is located in the door jamb 28 adjacent to the door edge 27 and on an axis transverse to the closed plane of the door. The length and diameter of the bore 50 should be adequate to accommodate the supporting flange 47 fairly snugly (Fig. 6) and to give ample longitudinal clearance for the retaining tube 45.

In order to accommodate the head 38, the keeper body has an outwardly opening cradle recess 51 in the base of which, and coaxial with the tube-supporting flange 47, is an aperture 52. Through this aperture, the stem tube 44 and the extension tube 46 are adapted to be protracted from the retaining tube 45 by movement of the keeper head 38 to door-checking position. The limit of extension of the stem and intermediate tubes 44 and 46 is defined by suitable lateral base stop flanges 53 thereon which coact with opposed stop shoulders 54 near the outer ends of the retaining and intermediate tubes 45 and 46, respectively.

In order to avoid relative rotary movement of the tubes, the stem and intermediate tubes 44 and 46 are provided with longitudinal, peripheral feather keys 55 (Figs. 2, 5 and 7). These keys engage slidably in suitable keyways 56 in the stop shoulders 54 and in the annular wall which defines the protraction aperture 52 of the keeper body (Figs. 6 and 12).

In order to prevent swinging the latch 34 out of the head 38 when the door is open, means is provided which will interlock the parts. As shown, this means may comprise a check pin 57 which is axially slidable within a transverse bore 58 in the keeper head 38. The bore 58 is disposed to register with a notch 59 formed transversely of the latch rib 42. When the check pin 57 extends into the notch 59, it is apparent that the latch 34 cannot be disengaged from the keeper head 38 (Fig. 3).

The check pin 57 is thrown into its interlocking position and is retracted automatically responsive to protraction and retraction, respectively, of the checking mechanism. For this purpose an oscillatable actuating rod 60 extends slidably through and projects endwise from the stem 44. The forward end of the rod 60 extends into the head 38 and has a transverse actuating finger 61 which fits within a suitably dimensioned transverse slot 62 in the check pin 57. A chamber permitting a limited range of sweeping movement of the actuating finger 61 is provided by a relatively large bore 63 which is formed eccentrically within the head 38 to intersect the check pin bore 58. Said eccentric bore 63 also serves during assembly of the device as the entrance for the actuating rod 60 and the finger 61, and is closed after assembly by a fixed plug 64.

At its rear end the actuating rod 60 carries a transverse pintle 65 which is secured thereto after assembly with the head 38. The pintle 65 rides in a suitable spiral cam slot 66 provided in a base plug 67 which is rigidly secured to the inner end of the stationary retaining tube 45 (Figs. 5, 8, and 12). Through this arrangement

as the check mechanism is protracted by opening of the door, the pintle 65 will follow the cam slot 66 and rotate the actuating rod 60 to throw the check pin 57 into its interlocking position. By the time the pintle 65 leaves the cam slot 63 due to continued extension of the check tubes, a suitable detent 68 in the keeper head 38 engages within a radial recess 69 in the actuating rod 60 to hold the latter against accidental pin-releasing movement (Fig. 3). When the check mechanism is retracted by closing of the door, the pintle 65 will again enter the cam slot 66 and cause the actuating rod 60 to be rotated in the opposite direction to effect withdrawal of the check pin 57 from the latch 34.

In the opening movement of the door 25 the edge 27 thereof will, of course, travel on a radius, and the keeper head 38 in following such travel will be deflected from the telescoped axis of the check tubes. Therefore, to compensate for such deflection of the check tubes, the latch 34 and the keeper head abutments 39 and 40 are constructed to allow sufficient deflection looseness or clearance. Such clearance is sometimes referred to as a "sloppy fit." However, in the inoperative condition of the device it is desirable to take up slack or tolerances in the parts so as to avoid rattling. This is accomplished by having a relatively snug fit between the annular faces of the shoulders 54 and the portions of the walls of the respective tubes engaged thereby in the collapsed or telescoped relationship of the parts, and by providing a bevel-seat relationship between the inner face of the keeper head 38 and the base of the keeper body 48 as indicated at 70 (Fig. 5).

Another desirable feature of this form of the invention resides in the locking engagement that may be effected between the latch 38 and the keeper body 48 automatically as an incident to closing the door 25 from the checked position. For this purpose the keeper body 48 carries a pair of undercut shoulders 71, one at each side of the mouth of the head-cradling recess 51. The shoulders 71 are in a plane which will permit the latch 34 to swing thereunder, one shoulder being engageable by the end of the latch and the other shoulder being engageable by a heel 72 provided for this purpose at one side of the latch (Fig. 4). Movement of the latch 34 into said locking engagement is effected automatically by the off-center spring 37 which acts to swing the outer end of the latch and the heel 72 under the respective shoulders 69 after the latch is released by the check pin 57 upon reclosing the door.

When the latch 34 is first swung into engagement with the head 38, it is held from traveling into the locking position, but is stopped in alinement within the mouth of the head 38 by suitable means such as an axially reciprocable stop pin 73 mounted in the base of the keeper body 48 (Figs. 5 and 9). The length of the stop pin 73 is sufficient to hold the latch 34 against the tension of its off-center spring 37 for a short interval after the door is started on its way toward open position, thus assuring proper alinement of the check pin notch 59 for receiving the check pin 57.

Immediately after clearing the end of the stop pin 73 the latch 34 is shifted slightly by the off-center spring 37 so as partially to overlie such end. This may be effected by having the check pin groove 59 of greater width than the diameter of the check pin 57 to afford a clearance permitting relative transverse movement of the latch and check pin. Accordingly, when the latch 34 is returned by the closing movement of the door, the stop pin 73 will be engaged endwise and forced to move axially through the base of the keeper body 48 (Fig. 10). After the latch clears the locking shoulders 71 it will be caused by the tension spring 37 to slide over the end of the stop pin and snap into locking position (Figs. 4 and 11). As shown, the stop pin 73 is carried yieldably by one end of a leaf spring 74. At its other end the leaf spring is suitably secured as by a screw 75 flatwise against the base surface of a transverse groove 76 which is formed in the rear face of the keeper body 48.

In the embodiment of the invention shown in Figs. 13 to 17, inclusive, the engagement unit includes means in the form of a rigid, flattened bar 77 which protrudes permanently beyond the edge 27 of the door 25 to engage with the keeper unit. Centrally near the protruding end of the bar is a transverse aperture or eye 78. This eye is adapted to register with a fixed keeper pin 79 which is rigidly mounted in the base of a suitably dimensioned keeper head 80. To connect the engagement bar 77 to the keeper head 80 for checking purposes, a keeper slide 81 is mounted in the head to be manually moved over the pin-engaging end of the bar. The pin base of the keeper head and the keeper slide form opposed abutments engageable by the engagement bar 77 in actuating the checking mechanism. As best seen in Fig. 17, the keeper slide 81 has oppositely extending longitudinal guide flanges 82 which ride in mortised guideways or tracks 83 formed in spaced, parallel outstanding flanges 84 on the keeper head 80. A suitable recess 85 within a keeper body 87 cradles the head 80 while it is inactive. The keeper body 87 is secured fixedly to the door jamb 28.

Projecting from the keeper head 80 through a large opening 88 in the base of the keeper body 87 and coaxially into a bore 89 in the door jamb 28 is a narrow tubular stem 90. On a transverse axis at its inner end, the stem tube 90 carries a pintle 91 which is adapted to ride in a spiral groove 92 provided in the internal wall of a surrounding telescopically related check tube 93. This check tube 93 is preferably of a length to fit entirely within the bore 89 behind the base of the keeper body 87 and of a diameter to pass freely axially through the base opening 88.

A connection between the keeper body 87 and the check tube 93 is effected through the medium of a pair of outer wall, spiral grooves 94 which form ways in the tube for a pair of coaxial guide rollers or pintles 95 supported by suitably spaced parallel ears 97 that project rearwardly from the base of the keeper body. The pitch of the internal groove 92 and the ways 94 is identical but reversely directed. As a result, when the keeper head 80 is protracted by the opening movement of the door, the stem tube 90 will advance out of the check tube 93, and the latter will simultaneously advance spirally through the keeper body opening 86. The limit of protraction is attained when the pintles 95 abut the shoulders provided by a base plug 98 which is secured to the inner end of the check tube 93.

In order to prevent release of the keeper slide 81 from checking position after the door has been opened, an interlock is provided by a flattened head 99 on the outer end of an actuating rod 100. The rod 100 passes through a bore 101 in the keeper head 80 and extends slidably through the

tubular stem 90 to project therebeyond at its rear end for engaging the base plug 98 in the non-checking or telescoped relationship of the checking mechanism within the jamb bore 89 (Fig. 14). At this time the interlock head 99 extends into a T-slot 102 within the keeper slide 81 (Figs. 14 and 16). Therefore, the keeper slide may be shifted freely.

However, when the door is opened and the keeper slide 81 is in its checking position, the interlock head 99 will move into interlocking engagement with the keeper slide. With this end in view, the head end of the actuating rod 100 is slightly enlarged and axially bored to provide a barrel 103 which is closed at its outer end by a short slidable piston 104 that abuts the adjacent wall of the keeper slide 81. Confined within the barrel by the piston is a compression spring 105 which is placed under compression, or "loaded", by telescoping of the piston 104 within the barrel 103 upon the aforesaid coaction between the actuating rod 100 and the plug 98. As the door is opened and the keeper head 80 is protracted, the inner end of the actuating rod 100 separates from the base plug 98 and the loaded compression spring 105 forces the piston 104 and the actuating rod 100 axially apart. This shifts the actuating rod 100 rearwardly in the keeper head until the interlock head 99 is seated within a complementary interlock recess 106 in the base of the keeper slide 81. Since the interlock head 99 is for all practical purposes inaccessible within the keeper head, it will be apparent that until the check mechanism is fully retracted so that the inner end of the actuating bar 100 is again in engagement with the base plug 98, the interlock head will not release the keeper slide 81. After the door is closed and the keeper slide 81 has been shifted to release the engagement bar 77, the interlock spring 105 is prevented from forcing the associated elements apart because the interlock head 99 and the aperture 106 will be out of register, the head engaging underlying shoulders 107 at either side of the T-slot 102.

To utilize the device as a night latch, the keeper body is provided with a lock tongue 108 which will engage within a slot 109 in the rear wall of the keeper slide 81. The lock tongue 108 is preferably of such length that it will enter the slot 109 when the keeper slide 81 is only partially removed from its checking position (Fig. 14). This results in holding the engagement bar 77 against withdrawal from the keeper head 80 and retains the keeper head 80 fast in the keeper body 87, thereby locking the door.

In the modified form of the invention shown in Figs. 18 to 24, inclusive, the engagement unit includes a flattened, reciprocable bolt 110 which is mounted slidablly within a housing 112. The latter is secured to the inner face of the door 25 adjacent to the edge 27 thereof so that the bolt may be projected by means of a handle 113 beyond such edge from a retracted position wherein the forward edge of the bolt is within the plane of the door edge (dot and dash position Fig. 23). The handle 113 is crank shaped and has one end pivotally connected to the bolt while the other end projects through an elongated slot 114 in the wall of the housing 112.

Herein the bolt 110 is automatically retractible by a tension spring 115 which is connected at one end to a pin 117 rigid with the inner end of the handle 113. At its other end the spring is attached to a stationary pin 118 which projects inwardly from the wall of the housing 112. When the bolt is fully retracted, the handle 113 engages at the rear end of the aperture 114.

As the bolt is extended by moving the handle 113 forwardly, the latter will engage a forward cam surface 119 which directs it into a forward laterally offset portion 120 of the slot. Then as the bolt is returned by the spring 115 which is placed under tension by this action, the handle will be carried against a shoulder 121 at the rear end of the offset portion 120. To insure such engagement of the shoulder by the handle, the spring pin 117 is preferably located eccentrically of the handle pivot as shown in Fig. 21.

When extended, the bolt 110 will coact with the keeper unit which for this purpose includes a keeper head 122 having spaced front and rear abutments 123 and 124, respectively, defining a mouth for receiving the bolt.

Associated with the head 122 is keeper mechanism including an elongated tube 125 of substantial diameter forming a stem projecting rigidly from the head. Telescoping into the stem tube 125 is a slidable extension tube 127. The limit of separation of the tubes 125 and 127 is defined by interengaging shoulders 128 and 129, respectively. Projecting laterally from the inner end of the extension tube 127 are a pair of rigid guide pins 130. The latter ride in elongated slots 131 provided in a pair of spaced parallel guide extensions 132 which project into a bore 133 in the jamb 28 from the base of a stationarily mounted keeper body 134. A recess 135 in the keeper body cradles the keeper head 122, and an opening 136 in the base of the keeper body affords an extension passage for the stem tube 125.

Through this arrangement the keeper head 122 will be brought to a halt to check the door, when the telescopic check tubes have reached their limit of extension. Deflection of the check mechanism to follow the door is permitted by pivoting of the guide pins 130 in the guide slots 131 (see dot and dash position, Fig. 18).

An interlock to prevent separation of the bolt 110 and the head 122 during the door checking function of the device is provided by a reciprocable pin 137 which is mounted within the head to traverse the bolt. To house the interlock pin 137 the front part of the keeper head 122 is provided with a chamber 138 which after assembly may be closed by a permanently secured plate 139. From the chamber 138 the interlock pin projects through a bore 140 in the front abutment 123 to enter an elongated interlock aperture 141 in the bolt 110. A shank 142 of reduced diameter for guiding and reenforcing the interlock pin 137 projects therefrom across the bolt-receiving mouth of the head into a guide bore 143 in the abutment 124. To accommodate the shank 142, the forward edge of the bolt 110 has a restricted throat opening 144 leading to the interlock aperture 141.

Means for automatically throwing the interlock pin 137 into the interlock aperture 141 of the bolt herein comprises a spring loaded actuator. Accordingly, a barrel 145 is connected rigidly to the front end of the interlock pin 137 by a spanner bar 146. The barrel is reciprocably received within a well 147 in the keeper head 122 coaxial with the stem tube 125 and has a rigid actuating stem 148 which extends therefrom slidably through the extension tube 127. In the fully collapsed condition of the checking mechanism, the free end of the actuating stem 148 projects beyond the tube 127 and engages an abutment,

herein a cross bar or pin 149 spanning the ends of the guide extensions 132. The length of the actuating stem 148 is such that when the head 122 is seated in the keeper body 134, the front end of the barrel 145 will abut or at least closely approach the closure plate 139, thus holding the interlock pin 137 out of interlocking relation to the bolt 110.

When the door 25 is opened with the bolt 110 in checking position, a compression spring 150 confined within the barrel 145 by a plunger 151 is released by the protraction movement of the keeper head 122. This causes the barrel 145 to shift rearwardly and carries the interlock pin 137 into the interlock aperture 141 of the bolt. Upon return of the door to closed position, the spring 150 is again compressed and the interlock pin released from the bolt.

Operation of the spring 150 to force the keeper head 122 forwardly after the bolt 110 is removed therefrom is avoided by a conventional automatically releasable detent 152 working between the head and the wall defining the head-cradling recess 135.

In order to provide for an automatic night latch engagement between the bolt 110 and the keeper body 134, the latter is provided with a pair of opposed, undercut locking shoulders 153 adjacent to the mouth side of the keeper head 122. Laterally projecting ears 154 at opposite sides of the forward end of the bolt are adapted to engage under the locking shoulders (Fig. 23). During the checking function of the device, the bolt 110 is in an advanced position so that the ears 154 will clear through notches 155 in the shoulders.

To hold the bolt 110 initially against the tension of its spring 115 out of the night latch position and in proper checking interengagement within the keeper head 122, suitable means such as an axially reciprocable stop pin 157 is provided (Figs. 18 and 21). This stop pin is mounted upon a leaf spring 158 to project slidably through the abutment 124 of the keeper body and into the path of the bolt. Thus, when the bolt is fully extended, the stop pin 157 will engage behind one of the locking ears 154. To pass the stop pin 157 in the first instance, the respective ear 154 may be beveled as indicated at 159.

After the door is opened and the ear 154 passes beyond the end of the stop pin 157, the bolt 110 will shift back slightly due to the pull of the tension spring 115 and the clearance between the interlock pin 137 and the aperture 141. As a result, the stop engaging ear 154 will shift into position to engage the end of the stop pin (Fig. 22). Therefore, when the door is again closed, the stop pin 157 will be pushed back by the ear 154. Freed of the stop pin impedance, the bolt 110 will, after release from the interlock pin 137 and after passing behind the inner face plane of the locking shoulders 154, be retracted with a snapping action by the tension spring 114. However, the bolt handle 113 will engage the stop shoulder 121 and hold the bolt in a partially retracted position, wherein the ears 154 will underlie the locking shoulders 153 (Fig. 23) and lock the door closed. To open the door it is then merely necessary to push the handle 113 off of the stop shoulder 121 and the bolt will snap into fully retracted position.

From the foregoing it will be apparent that this invention provides a substantially improved safety door check construction in which most of the checking mechanism telescopes out of the way into the door jamb. During the inoperative condition of the structure the checking mechanism will remain concealed from view and avoid attracting attention or tampering. Moreover, this construction lends itself to unusual structural compactness and simplicity of exterior design so that the door and the jamb need be mutilated very little for installation of the device; and when in place the device creates a good impression by its appearance of efficient, simple sturdiness.

Withal, a safety door check constructed according to this invention may be manufactured at reasonable cost, is readily adaptable to various types of door and jamb constructions and will take into consideration the problems of shrinkage, settling and shifting thereof. The device is strong and efficient and practically tamper proof when the door is checked open. As an additional feature and without complicating the structure, the device serves also as a positive night latch which may become automatically effective whenever the door is closed from its checked position.

We claim as our invention:

1. A door check construction comprising, in combination, a keeper assembly including elongated check means adapted to project coaxially into an annular door jamb bore of substantial depth having its mouth adjacent to the vertical swinging edge of a door and opening in the direction of the opening movement of the door, a keeper body adapted to be secured fixedly over the mouth of the jamb bore and having an aperture therein to permit said check means to reciprocate longitudinally therethrough, means for limiting the outward movement of said check means, a head on the outer end of said check means cradled by said keeper body when said check means is in its retracted position, means adapted to be mounted upon the door for interengagement with said head in the closed position of the door and effective when the door is opened to draw said head and said check means outwardly, means for locking said door mounted means and said head against separation, means inaccessibly located interiorly of said head operable automatically as an incident to the opening movement of the door for driving said locking means into locking position and also automatically operable to release said locking means when the door is returned to closed position, and manually engageable means for releasing said door mounted means from said head only when the door is closed, whereby to permit subsequent unchecked opening of the door.

2. A safety door check construction comprising, in combination, a keeper assembly including movable check means adapted to be mounted on a door jamb, means for limiting the range of movement of said check means, a head carried by said check means, means adapted to be mounted upon the door to interfit with said head in the closed position of the door so that upon opening the door said check means will be protracted, means for locking said door mounted means and said head against separation, and means inaccessibly located interiorly of said head operable automatically as an incident to protraction movement for driving said locking means into locking engagement and also automatically operable to release said locking means upon retraction of said head.

3. A safety door check construction comprising, in combination, mechanism to be mounted upon the door jamb including retaining means and

a head connected therewith for limited relative movement in a path generally parallel to the path of the opening movement of the adjacent edge of the door, said head having a pair of spaced abutments projecting generally toward the edge of the door, means adapted to be mounted upon the door to project between said abutments whereby said head will be moved in respectively opposite directions relative to said retaining means by opening and closing movement of the door, and means within said head working between said abutments to provide an interlock between said head and said door mounted means.

4. A safety door check construction comprising, in combination, an engagement unit to be mounted on a door at the vertical swingable edge thereof, a keeper unit to be mounted upon the door jamb to cooperate with said engagement unit, said keeper unit including means to be secured in stationary relation to the jamb and check mechanism including a head confined by said means to a definite range of movement relative thereto, means for connecting said head and said engagement unit, and means within said head for interlocking said head and said connecting means.

5. A safety door check construction comprising, in combination, an engagement unit to be mounted on a door at the vertical swingable edge thereof, a keeper unit to be mounted upon the door jamb to cooperate with said engagement unit, said keeper unit including means to be secured in stationary relation to the jamb and check mechanism including a movable head having an elongated guide member projecting therefrom permitting said head to be drawn away from said stationary means a limited distance, means for connecting said head and said engagement unit for joint movement as an incident to opening and closing of the door within the range permitted by said elongated means and being also operable in one relative condition of the parts to interengage with said stationary means to lock said head against movement and the door against opening, and a device operable when the door is opened to interlock said connecting means and said head and automatically releasable from the interlocking condition as an incident to closing of the door.

6. A safety door check comprising, in combination, movable check means to be mounted on a door jamb, means to be mounted on the associated door and adapted to be connected with said check means so that the opening movement of the door will be definitely limited, and means located to be positively held inoperative in the closed door position of said check means but automatically operable in the initial opening movement of the door to move into position to interlock said check means and said door mounted means against separation while the door is in the checked open position, said interlock means being located to prevent tampering therewith while it is in operation.

7. A safety door check of the character described including, in combination, a keeper body adapted to be secured rigidly at the mouth of an elongated bore in a door jamb, a plurality of telescopically interfitting check tubes working through said body to be received telescopically within the jamb bore, a keeper head carried by the furthest extensible check tube, engagement means to be mounted upon the door and including a part adapted to coact with said keeper head in the closed position of the door, and means passing coaxially through said check tubes and into said keeper head for interlocking said part with said head when the check tubes and said keeper head are actuated by said part as an incident to opening movement of the door.

8. In combination in a safety door check construction of the character described, engagement means adapted to be secured to a door, door checking means adapted to be secured to a door jamb and including a keeper body and check mechanism movable relative to said keeper body, said check mechanism including means coactive with said engagement means for effecting said relative movement as an incident to movement of the door, means on said keeper body adapted to interengage with said engagement means to lock the door against opening movement until positive disengagement is effected manually, and means automatically operative to effect locking coaction between said engagement means and said interengagement means as an incident to return of the door from checked position to its closed position.

9. In combination in a safety door check construction of the character described, engagement means adapted to be connected to a door and including a movable part to project therefrom into overlapping relation to the adjacent door jamb when the door is closed, checking means adapted to be mounted upon the door jamb for interengagement with said part, stop means on said checking means for defining the relative position of said part and said checking means upon initial interengagement thereof, means tending to shift said part slightly relative to said checking means, said part and said stop means being disengageable upon movement of the checking means toward door checking position so that said shifting means can operate and upon return to the door closed position said part will avoid the impedance of said stop means, and means associated with said checking means adapted to be engaged by said part automatically as an incident to said return to the door closed position for effecting a locked relationship preventing subsequent opening of the door until said part is manually released.

10. In combination in a door check construction of the character described, engagement means adapted to be mounted upon a door and including a movable member adapted to project beyond the vertical swinging edge thereof, a keeper assembly adapted to be mounted upon the associated door jamb and having check means to receive said movable member, means for urging said member in one direction relative to said keeper assembly, a shiftable stop on said keeper assembly for holding said member in a given position in opposition to said urging means when said member is initially received by said check means, means for confining the movement of said check means to a given range, means for locking said member and said check means against separation while they are coacting to check the opening movement of the door, said stop being rendered automatically inoperative by said member upon return of the latter from door-checking position so that said member will be caused by said urging means to move in said one direction upon release of said locking means.

11. In combination in a safety door check construction of the character described, an engagement unit to be mounted upon the door and including a pivoted latch member, a keeper unit to be mounted upon a door jamb, said keeper

unit including means to be secured fixedly to the door jamb and checking means confined to a definite range of movement by said fixedly secured means, a head on said checking means including a mouth adapted to receive the end of said latch, means for swinging said latch into said mouth, and means within said head automatically operable as an incident to movement of the head toward checking position for effecting an interlock between said head and said latch.

12. In combination in a door check construction of the character described, a rigid catch bar adapted to be secured to a door and to project beyond the edge thereof, a keeper assembly adapted to be mounted upon the adjacent door jamb and including a retainer member and head connected for limited movement relative thereto, said head being constructed to receive the projecting end of said catch bar in the closed position of the door, a movable keeper slide mounted upon said head for connecting said head and said catch bar together, and means automatically operable as an incident to opening movement of the door while said catch bar is connected to said head to lock said keeper slide against movement until the door is again closed.

13. In combination in a door check construction of the character described, a rigid catch bar adapted to be secured to a door and to project beyond the edge thereof, a keeper assembly adapted to be mounted upon the adjacent door jamb and including a keeper member and a head connected for limited movement relative thereto, said head being constructed to receive the projecting end of said catch bar in the closed position of the door, a movable keeper slide mounted upon said head for connecting said head and said catch bar together, and means on said member adapted for engagement by said keeper slide for locking said head against movement relative to said member while said catch bar is connected to said head in the closed position of the door.

14. A door check of the character described comprising, in combination, a keeper unit including a body to be fixedly mounted and reciprocable means held within defined reciprocal limits by said body, said reciprocable means including a plurality of members arranged to fit together telescopically into a substantially shorter space than is occupied thereby when the members are extended, an engagement unit having means adapted for cooperation with said reciprocable means in the closed condition of the associated door and operable to effect extension of said telescopic members as an incident to opening of the door, and means for interlocking said reciprocable means and the cooperating means of the engagement unit in the open-door condition thereof and automatically operable to release the same when the door is closed.

15. A door check of the character described comprising, in combination, a keeper unit including a plurality of longitudinally extensible telescopically related coaxial tubes and means adapted to be mounted stationarily to receive said tubes in the telescoped condition thereof including means adapted to coact with the outermost tube to limit the distance to which said outer tube may be extended, means carried by said tubes coactive to define the extended limit of said tubes, a head carried by the farthest extensible of said tubes, and an engagement unit including an element to engage with said head.

16. A door check of the character described comprising, in combination, a keeper unit to be fixedly mounted including a head carried by a plurality of telescopically related members for reciprocation within the limits defined by the fully telescoped and the fully extended conditions of said members, an engagement unit including an element to engage with said head for effecting reciprocation thereof coincident with opening and closing movements of the associated door, and relatively movable means carried by said head movable into interlocking engagement with said element as an incident to extension of said members and automatically releasable substantially coincident with return of said members to fully telescoped condition.

17. A door check of the character described comprising, in combination, a keeper unit including a movable chambered member, an engagement unit including an element to extend into said chambered member, and means movable interiorly of said chambered member for locking said element and said member together.

18. A door check of the character described comprising, in combination, a keeper unit including extensible means, an engagement unit including an element for interengagement with said extensible means, means for locking said element and said extensible means together, and means acting between the rear end of said extensible means and said locking means to move said locking means into locking position when the associated door is opened and for disengaging said locking means when the door is closed.

19. A door check of the character described comprising, in combination, a keeper unit including an assembly of telescopically related extensible tubes, an engagement unit including an element for coaction with said tube assembly, means extending coaxially through said tubes and having a part for effecting an interlock between said tube assembly and said element, and means for actuating said coaxial means as an incident to extension and return of said tubes for moving said part respectively into and out of interlocking position.

20. A door check of the character described comprising, in combination, a keeper unit including a part to be fixedly mounted and an assembly of telescopically related tubes extensibly supported by said part, an engagement unit including an element for interengagement with said tube assembly, and means for effecting an interlock between said element and said tube assembly including a rigid member extending coaxially through said tubes, and means at the inner end of the tube assembly for engagement by said rigid member for releasing the interlock when the tubes are fully collapsed.

21. A safety door check of the character described adapted to be mounted upon a door and the door jamb adjacent to the opening edge of the door comprising, in combination, a keeper assembly including a keeper body having an opening of limited diameter, a head larger than said opening including a stem of smaller diameter than said head projecting reciprocably through said opening, means for limiting protraction of said stem from said opening, said keeper body having a cradle recess for receiving said head in the retracted condition of said head and stem, and means adapted to project removably into interengagement with said head.

22. A door check of the character described including, in combination, a keeper unit including

an elongated longitudinally reciprocable member confined to a predetermined range of movement, an engagement unit including means for separable cooperation with said reciprocable member, and means for interlocking said reciprocable member and said means against separation in the open-door condition thereof and automatically operable to release the same upon return thereof to closed door relationship.

MAURICE A. LEVY.
CLARENCE E. SMITH.