

Aug. 31, 1937.

D. P. HYNES

2,091,816

CAR DOOR FASTENING

Filed Aug. 15, 1935

3 Sheets-Sheet 1

Fig. 2.

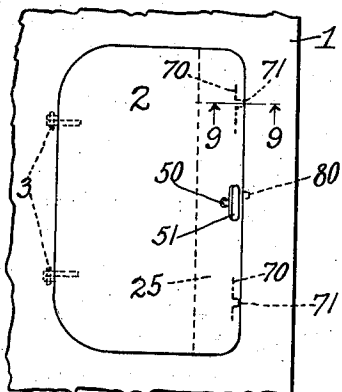


Fig. 1.

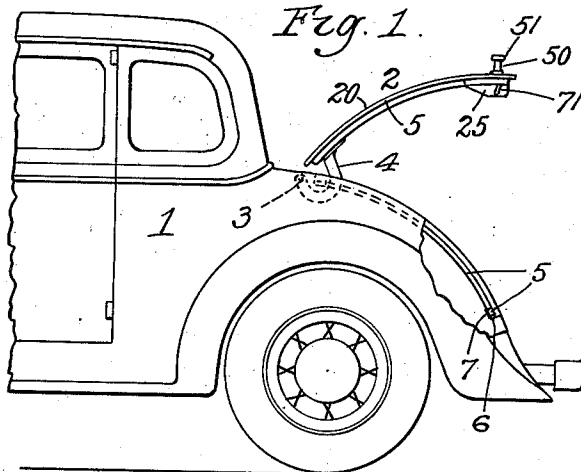


Fig. 3.

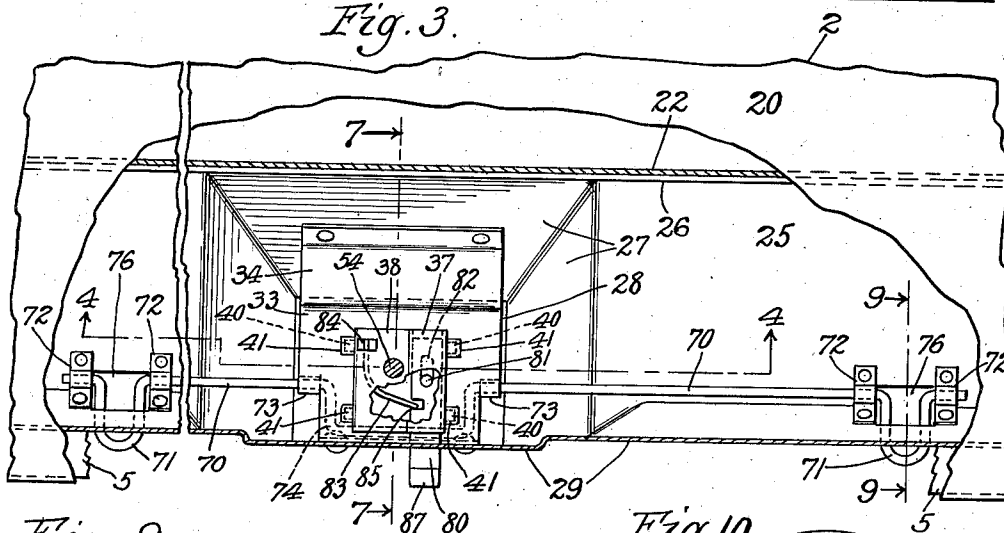


Fig. 9.

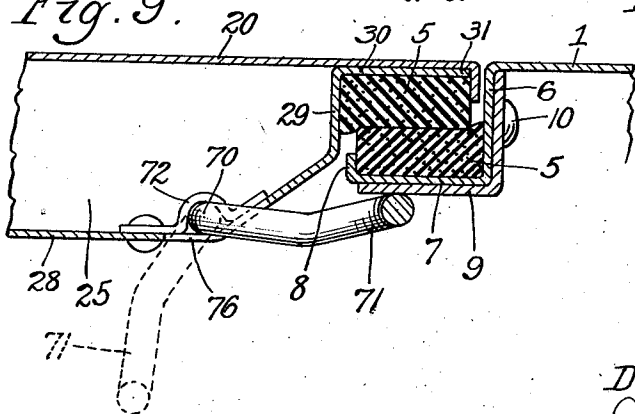
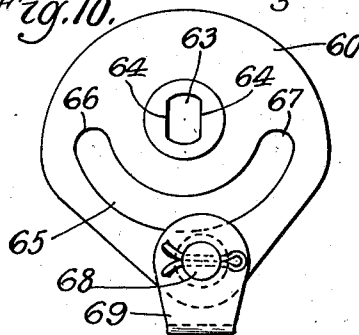


Fig. 10.



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3 Sheets-Sheet 2

Fig. 5.

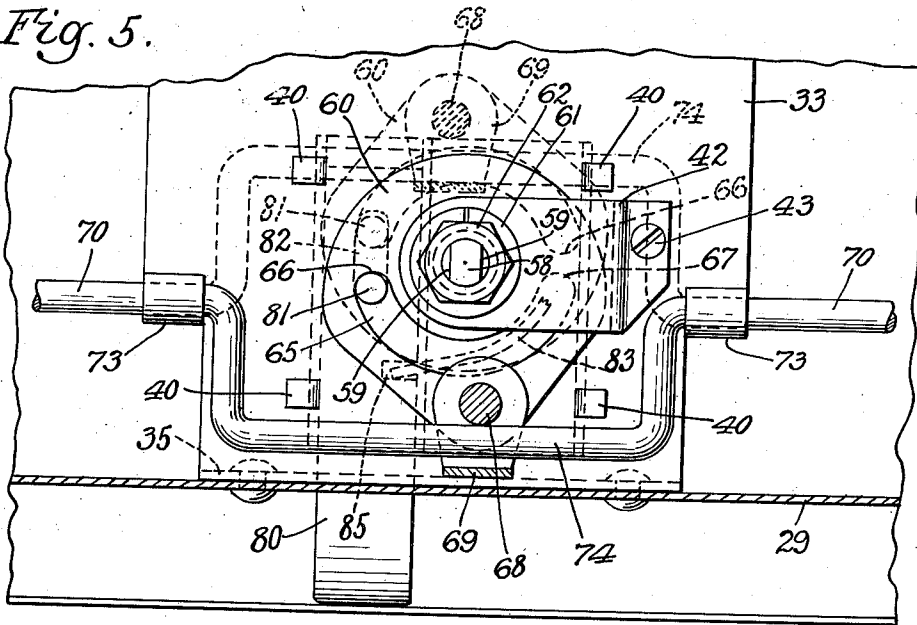
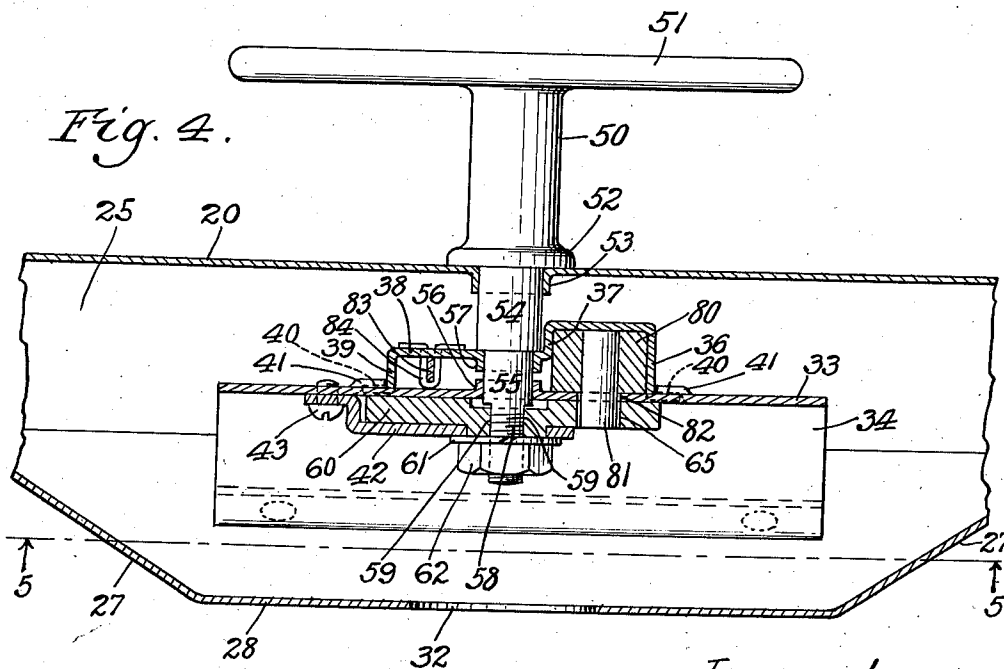


Fig. 4.



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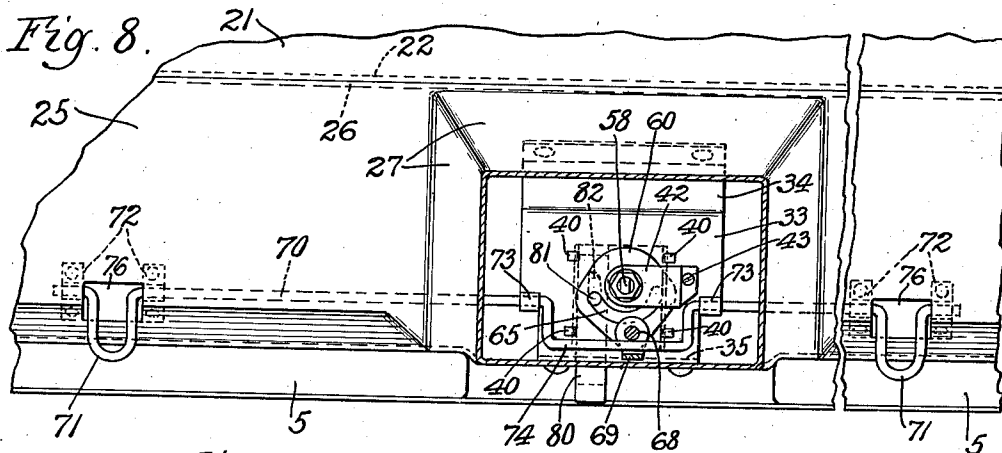
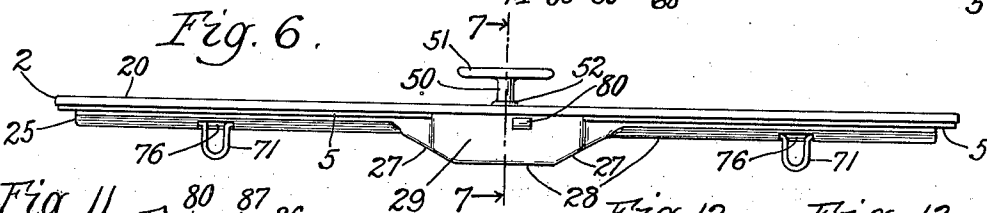
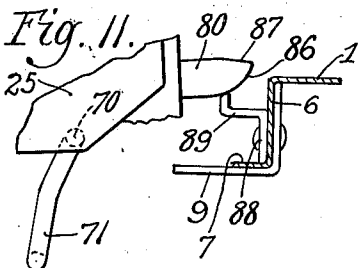
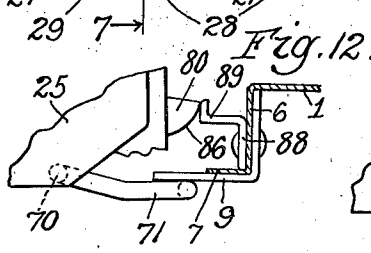
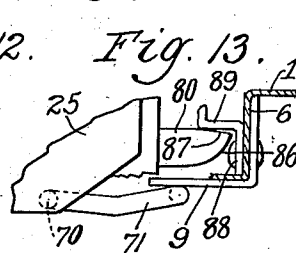
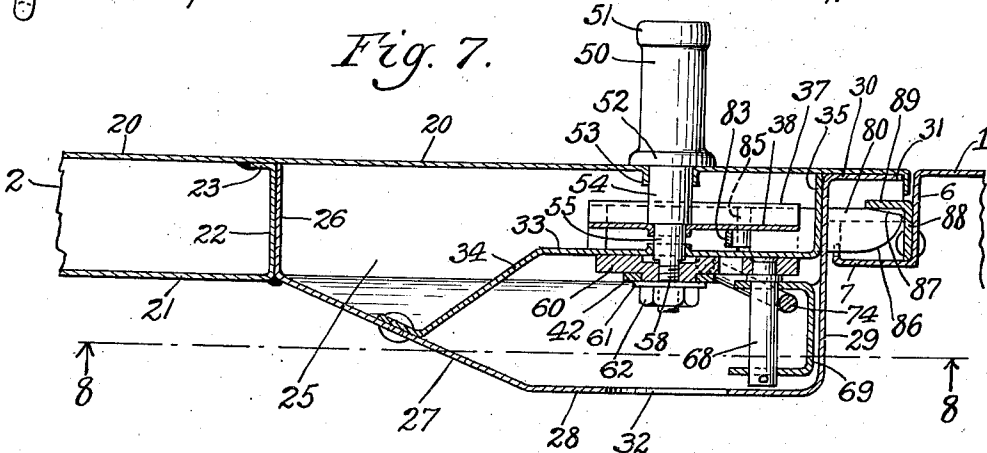
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,091,816

CAR DOOR FASTENING

Dibrell P. Hynes, Chicago, Ill., assignor to Chicago Forging & Manufacturing Co., Chicago, Ill., a corporation of Illinois

Application August 15, 1935, Serial No. 36,257

8 Claims. (Cl. 292—5)

My invention relates to improvements in closures and has for one purpose the provision of closure means whereby a door may be moved into closed position prior to the actuation of the locking means intended to hold it in closed position. One application of my invention is to rear closures for automobiles, but it will be understood that a wide variety of other applications may be made of the invention. One object is the provision of means for permitting the closure of doors having yielding packings or pads or buffers. Another object is the provision of means for moving a door into closed position prior to the movement of the closing latch along an axis or in a plane generally parallel with the plane of the door itself. Other objects will appear from time to time in the course of the specification and claims.

I illustrate my invention more or less diagrammatically in the accompanying drawings, wherein—

Figure 1 is a side elevation of a car, with parts broken away, showing the door in open position;

Figure 2 is a plan view of the car with the door in closed position;

Figure 3 is a top plan view with parts broken away, illustrating the locking parts in locked position;

Figure 4 is a section on the line 4—4 of Figure 3;

Figure 5 is a section on the line 5—5 of Figure 4;

Figure 6 is an edge view of the door;

Figure 7 is a section along the lines 7—7 of Figures 3 and 6, with parts in locked position;

Figure 8 is a section of the structure shown in Figure 7, illustrating the parts in locked position, section being made along the line 8—8;

Figure 9 is a section on the line 9—9 of Figures 2 and 3;

Figure 10 is a detail of the actuating means operated by the exterior handle;

Figures 11, 12 and 13 are diagrammatic illustrations of the movement of the door and locking means to closed or locking position;

Like parts are indicated by like symbols throughout the specification and drawings.

Referring to the drawings, 1 generally indicates the body of an automobile, and 2 the rear car door hinged as at 3 by any suitable offset supports 4. 5 indicates rubber padding around the door closure. Such padding or packing means, preferably yielding or elastic, may be applied to the door frame or to the door or to both as shown, for example, in Figure 9. Refer-

ring to Figure 9, the door is shown as being bounded by a frame which includes an inwardly turned flange 6, a flange 7, and a lip 8, the yielding packing or padding 5 being fitted into the space bounded by the members 6, 7 and 8. Any suitable additional reinforcement may be employed shown in Figure 9 as an angle 9, bolted in position as by the bolt 10 and adapted to serve as abutment means for the door positioning locking means below described.

The door, generally indicated as 2 in Figure 1, includes preferably a single outer panel or surface member 20. The upper portion of the door, the body of the door proper may be formed in any suitable way, but I illustrate an inner door portion 21 provided with the flange 22 and a lip or angle 23 abutting against the inner face of the panel 20 at a point somewhat short of the lower edge of the door. The parts may be spot welded or otherwise secured together. In order to provide a convenient positioning locking unit for the door which is readily applicable to the door before or during the passage of the automobile down the assembly line in the course of its manufacture, I employ a species a panel or housing generally indicated at 25 which includes a flange 26 opposed to the flange 22, as shown in Figure 7, an inclined portion 27, and an additional portion 28 generally parallel with the door panel 20, a flange 29 extending from the portion 28 toward the door panel, a flange 30 adapted to abut against the rear face of the door panel and extending, as at 31, to the lower edge of the panel. The member 28 is apertured as at 32 in line with the locking structure below described. A bracket is positioned within the panel so formed. It includes a portion 33 generally parallel with the member 28, a connection 34 extending to the member 27 and a flange 35 abutting against the upper portion of the member 29 and extending preferably upwardly toward or against the rear face of the door panel 20. A guide plate structure is mounted upon the member 33. It includes, for example, a lock bolt guide having a side 36 and a top 37, an extension 38 therefrom, and a side wall 39, the side walls 36 and 39 being provided with lugs 40 which may be secured in any suitable fashion to the member 33 but are shown as seating in recesses formed by struck up portions 41 of the member 33. 42 indicates a lower bearing plate which is secured as at 43 to the opposite side of the member 33. Its primary purpose is to hold the assembly in position when the handle below described is removed.

50 indicates a manual exterior handle shaft having a handle of any suitable shape 51 secured thereto. 52 is an enlargement on the handle overlying the flanged aperture 53 of the door panel 20. A shaft portion of reduced diameter is indicated as at 54, passing through and in bearing relationship with the flanges 53 if desired. A further reduced portion 55 is in bearing relationship with flanges 56, 57, formed in the members 33 and 38 respectively. The lower end of the reduced shaft portion 55 is screwthreaded as at 58 and is cut away or flattened on opposite sides as at 59. Secured to it and held by the flattened portions against rotation is the actuating disc 60 which is held in position as by the washer 61 and the nut 62. As shown in Figure 10 the disc 60 has an aperture 63 with flattened sides 64 conforming to the cut away portions 59 of the screwthreaded shaft portion 58. 65 indicates an actuating slot having opposite actuating ends 66 and 67. Extending from the disc is a pin 68 which has mounted upon it a connector member or stirrup 69. It will be understood that rotation of the handle portion 51 rotates the disc 60 and therefore rotates the pin 68 and the stirrup or connector 69.

70 indicates a rock shaft formed at its opposite ends with latching or door positioning members or loops 71. It is mounted in bearings there being a pair of bearings 72 on opposite sides of each of the loops 71 and other bearings 73 formed in the bracket member or plate 33. An intermediate offset 74, of the rock shaft 70, passes between the pin 68 and the stirrup 69 whereby, in response to rotation of the handle 51, the rock shaft is rotated to move the members or finger loops 71 into and out of door closing position. The fingers 71 protrude through apertures 76 in the plate 28.

40 In addition to the door closing rock shaft 70 with its fingers 71, I provide a locking bolt generally indicated as 80 which is slidably mounted in the pocket formed by the members 36, 37 and the opposed portion of the member 33. It is provided with a pin or projection 81 adapted to ride in the slot 65 of the disc 60. When the pin 81 is intermediate the ends of the slot 65 the rotation of the disc 63 has no effect on it. But when it is engaged by the end 66 or 67 respectively, the bolt 80 is moved up or down, into or out of locking position, depending upon which end of the slot it is contacted by. It will be understood, of course, that the member 33 is apertured as at 82 to permit a sliding movement of the pin 81 with the bolt 80. I may employ yielding means for urging the bolt 80 into or out of closing position. In the disclosure of Figures 3 and 7, for example, a spring 83 is illustrated secured at one end as at 84 to the plate 38 and penetrating at its other end a recess 85 in the bolt 80. The spring thus tends to thrust the bolt 80 into locking position. It will be understood, and it is thought not to call for additional illustration, that the relationship of the spring and the bolt may be reversed so that the bolt can be urged into unlocking position. There are advantages to either arrangement. I form the bolt 80 with a bevelled surface 86 on the side opposed to the locking abutment when the door is moved into closed position. I bevel it also, slightly, as at 87, on the opposite side of the bolt as will be clear from Figure 7. I provide as a locking abutment for the bolt an angle member having one flange 88 parallel with and secured to the door frame and the other 89 perpendicular thereto. If the door is dropped or slammed into

position the incline of the portion 86 may be effective to cause the bolt 80 to move against the spring 83, to permit the bolt to slip over the abutting flange 89 and then move yieldingly into locking position, in response to the spring thrust. On the other hand, if the door does not "take" the user can positively move the bolt 80 into locking position by rotation of the handle 51 which, by an engagement of the pin 81 with an end of the slot 65, will positively thrust the locking member into position. However, it cannot be thrust into position until the point or horn of the latch, the meeting of the surfaces 86 and 87, passes over and clears the member 89. The ends 66 and 67 are separated by an arc sufficient to allow free movement of the bolt except during a limited part of the movement, when one or the other of the actuating ends is effective to retract the bolt, or to drive it into fully locked position. That is to say that throughout the major range of the movement of the member 60, the slot 65 is performing no function. When the part 60 is in the position in which it is shown in Figure 5 or Figure 8, the actuating end 66 is effective to engage the pin 81 and to thrust the bolt 80, and to hold it, positively in locked position. Similarly, it is not until the member 60 has been rotated throughout a very substantial arc that the opposite actuating end 67 of the slot 65 engages the pin 81 and is then effective positively to withdraw the latch 80 to unlocked position. During all intermediate positions of the member 60, the slot has no effect on the movement of the bolt.

It will be observed from the diagrammatic showings of Figures 11, 12 and 13, that there is a lead of the finger 71 which is such that they are effective to draw the door downwardly or inwardly towards closing position before the same rotation of the handle 51 moves the bolt 80 into locking position. In the preferred employment of the device the user rotates the handle 51 in the proper direction to cause the finger 71 to move against the opposed abutments, as shown in Figure 9, whereby the door is drawn downwardly into closed position. In the device as shown in Figure 9 the effect of the rotation of the handle 51 is to compress the opposed sponge rubber abutments 5 until the door reaches locking position. At that time the bolt 80 will have passed over and cleared the abutment 89 and a continued rotation of the handle 51 will positively thrust the bolt home, if the parts are so fitted that the spring 83 is not able to do so. Thus there is a positive locking cycle in which a single rotation of the handle 51 first draws the door into closed position and then either permits the spring to thrust the latch 80 home or positively to thrust it home in response to an engagement between the pin 81 and an end of the slot 65. It will be understood, of course, that the member 89 may be of any desired formation. It is shown as a simple edged flange in Figure 7, whereas in Figure 11 the edge is somewhat broadened.

In the form herein shown a single unitary panel structure, including the portions 26, 27, 28 and 29 is applied to the lower edge of the door. The member 42 holds the disc 60 in position in relation to all moving parts except the handle itself which is secured by the locking nut 62 and washer 61. The aperture 32 permits the workman to thrust the handle shaft into the position in which it is shown in Figure 4 and then to apply the washer 61 and the nut 62 and tighten up the nut, thus locking the handle in proper position. The panel as a whole may then be

additionally secured to the door in any suitable fashion, as by spot welding as shown in Figure 7. Thus my entire assembly may be pre-manufactured and shipped as a unit to the automobile assembly line. The rock shaft 70 is, of course, secured to the panel and there is a minimum loss of time on the assembly line and a minimum of time and difficulty in applying the device.

It will be realized, however, that my invention need not be limited to a separate panel but may be applied directly to the door. Whereas as it is shown applied to an automobile it is also adaptable to other closures or mechanisms. I therefore wish my description and drawings to be taken as in a broad sense illustrative or diagrammatic, rather than as limiting me to the specific showing of my description and drawings.

I claim:

1. In a closing and locking means for a door, a single outside handle mounted on said door, door latching means positioned within the door, and an actuating connection between said door latching means and said handle, said door latching means including a slidable bolt member adapted to be projected by said actuating connection, door positioning means, positioned within the door, and abutments opposed thereto, and an actuating connection between said door positioning means and said handle adapted, in response to rotation of said handle, to move said door toward closed position, prior to actuation of said slidable bolt member.

2. In a closing and locking means for a door, a single outside handle mounted on said door, door latching means positioned within the door, an actuating connection between said door latching means and said handle, said door latching means including a slidable bolt member adapted to be projected by said actuating connection, door positioning means, positioned within the door, abutments opposed thereto, and an actuating connection between said door positioning means and said handle adapted, in response to rotation of said handle, to move said door toward closed position, prior to actuation of said slidable bolt member, and yielding means tending normally to thrust said slidable bolt member into locking position.

3. The structure of claim 1 characterized by the employment of a rotary member connected for unitary rotation with the exterior handle, said member having an arcuate slot concentric with the axis of rotation of said member, and a pin on the bolt, penetrating said slot.

4. The structure of claim 1 characterized by the employment of a rotary member connected for unitary rotation with the exterior handle, said member having an arcuate slot concentric with the axis of rotation of said member, and a pin on the bolt, penetrating said slot, the length of said slot being sufficient to permit an actuating engagement between an end of said slot and said pin on the bolt, in response to a locking movement of the handle, after the door positioning means have moved the door into closed position.

5. In closing and locking means for a door, a rock shaft rotatably positioned on said door, levers associated with said rock shaft and adapted, in response to rotation of said shaft, to draw said door toward the closed position, and additional locking means, and means for actuating it, adapted to lock said door in position after it has been moved a predetermined distance toward the closing position in response to rotation of said rock shaft, and unitary handle means adapted, in response to a predetermined movement of said handle, first to rotate said shaft and thereby draw the door towards closed position, and thereafter, after a predetermined closing movement of the door, to close said locking means, said locking means including a bolt slidably positioned upon said door.

6. In closing and locking means for a door, a rock shaft rotatably positioned on said door, levers associated with said rock shaft and adapted, in response to rotation of said shaft, to draw said door toward the closed position, and additional locking means, including a bolt slidably mounted upon said door for movement transversely of the axis of rotation of said rock shaft and adapted to be projected in response to rotation of said rock shaft, and unitary means for rotating said rock shaft and for moving said bolt, including a handle mounted upon said door, a lever member, associated with said handle, mounted within said door, a rotating connection between said lever member and said rock shaft, adapted to impart rotation to said rock shaft, and an additional connection between said lever member and said bolt, adapted to impart a sliding movement to said bolt in response to rotation of said handle, after a predetermined closing movement of the door.

7. In closing and locking means for a door, a rock shaft rotatably positioned on said door, levers associated with said rock shaft and adapted, in response to rotation of said shaft, to draw said door toward the closed position, and additional locking means, and means for actuating it in response to rotation of said rock shaft, adapted to lock said door in position only after it has been moved a predetermined distance toward the closing position in response to rotation of said rock shaft, and yielding means tending normally to urge said additional locking means into a predetermined position.

8. In closing and locking means for a door, a rock shaft rotatably positioned on said door, levers associated with said rock shaft and adapted in response to rotation of said shaft, to draw said door toward the closed position, and additional locking means, and means for actuating it in response to rotation of said rock shaft, adapted to lock said door in position only after it has been moved a predetermined distance toward the closing position in response to rotation of said rock shaft, and yielding means tending normally to urge said additional locking means into a locking position.

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