

# PATENT SPECIFICATION

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## (54) A DOOR AND DOOR FRAME ASSEMBLY /

(71) We, INVENTIO AKTIENGESELLSCHAFT, of 6052 Hergiswil NW, Switzerland, a joint stock company organised under the laws of Switzerland, do hereby  
5 declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 The present invention relates to an assembly of a door hinged at or near one vertical edge portion thereof and a door frame.

In known door and door frame assemblies used as residence closures, the door is often made of wood or of a material based on wood, and the frame of wood or metal. The door usually opens inwardly and may  
15 at one edge have a step which bears against the side of the frame facing the interior of the residence when the door is closed.

These assemblies have the disadvantage that in the case of forcible action from outside, for example in the case of burglaries, the acting forces must be absorbed by  
20 a dead bolt of a lock at the one edge and by the hinges of the door at the other edge. The arising high pressures either tear off the hinges at the door or at the frame or tear out the dead bolt at the frame or the lock. It is also possible that the frame, can part from the border of the door opening.

Doors may be partially manufactured of metallic hollow sections clad with coverings and the frames may be manufactured  
25 of metallic hollow sections which are anchored in the border of the door opening. Also the hinges may be welded on the door and frame. By these measures, the strength of the door itself, the closure and the hinges is increased. However, the basic problem remains, i.e. that external forces acting on the door concentrate substantially  
30 at three points.

45 According to the present invention there is provided an assembly of a door hinged at or near one vertical edge portion thereof and a door frame comprising two jambs each provided with a longitudinally extending channel, the door when shut having

said one edge portion extending within and being closely adjacent side wall portions of the channel of one jamb, and being provided with a bolt at or in an edge portion of the door opposite said one edge portion,  
55 and a door member at least partially disposed at or in the opposite edge portion and displaceable to extend within and closely adjacent side wall portions of the channel of the other jamb, the door member being elongate and extending along substantially the length of the channel.

The frame may comprise hollow metal sections.

The door may comprise hollow metal sections provided with cladding.

The displaceable member may comprise two elongate elements which are each pivotably mounted at a respective one of two opposite end portions of the displaceable member in a channel provided in said  
70 opposite edge portion of the door, each element being provided with a mutually aligned opening engaged by an entraining member connected to the bolt.

The mutually aligned openings may be situated approximately mid-way between the end portions of the displaceable member.

The mutually aligned openings may define an elongate recess and the entraining member may be so connected to the bolt that displacement of the bolt from a non-locking position to a locking position causes the displaceable member to project  
85 into the channel in the associated jamb.

The door may comprise in one major side face a recess containing a housing in which is disposed a locking mechanism, the housing having a wall portion which together with a wall portion of the recess  
90 defines the channel in said opposite edge portion of the door.

The housing may be detachably received in the recess.

The door may be arranged to be closable in only one direction, the major side face of the door facing the closing direction being provided with a bevelled portion and the channel of the said one jamb having a wall surface portion which is parallel to the  
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bevelled portion when the door is shut.

The jambs may be each provided with a further longitudinally extending channel opening in the opposite direction to that of the respective first mentioned channel of the jamb.

The said other jamb may be provided with a longitudinally extending shoulder providing a stop surface for the door when closed.

The present invention also extends to a kit of parts for manufacturing the assembly as defined above, comprising the door and the two alongate members each intended to constitute a respective jamb, one member being provided with a longitudinally extending channel of such size and configuration that it has side wall portions which will be closely adjacent the said one edge of the door when shut, and the other member being provided with a longitudinally extending channel of such size and configuration that it has side wall portions which will be closely adjacent the portion of the displaceable member intended to extend within the associated channel when the door is shut.

An embodiment of the present invention will be more particularly described by way of example with reference to the accompanying drawings in which

Fig. 1 shows a partial view of a door and door frame assembly provided with a displaceable member inside a channel in the door,

Fig. 2 shows a partial view of the door when closed, the displaceable member projecting from the channel,

Fig. 3 shows a section along the line A-A of the Fig. 1,

Fig. 4 shows a section along the line B-B of the Fig. 2, and

Fig. 5 shows a partial cross-section of the assembly at the hinged edge portion of the door.

Referring now to the drawings, a single door of a residential closure is designated by 1 in the Figs. 1 to 4. The door 1 comprises hollow sections which are assembled from metallic sections manufactured by for example folding or extruding, and clad with covering 2. A door lock 3, which has a dead bolt 4, a sping bolt 5 and an actuating handle 6, is fastened in a housing 11 manufactured of metallic section 7, 8, 9 and 10 manufactured by for example folding or extruding. The housing 11 extends over the entire height of the door and is inserted in a recess 12 of the door 1 and screwed to this by means of screws 13. The rear wall 8 of the housing 11 together with a channel 14 extending over the entire height of the door defines a slot-shaped channel 15 open at the lock side of the door 1.

A displaceable member 16, which con-

sists of two elements or rails 17 and 18 extending over the entire height of the door, is arranged in the channel 15. The elements 17 and 18 are pivotably mounted by means of a respective one of the screws 13 disposed at the lower and the upper edge of the door 1, respectively. The elements have free ends which are each provided with a respective slot 19 and 20, by means of which they are guided on respective ones of the screws 13. Each element 17 and 18 is provided with a respective aligned or overlapping opening 21, situated midway between the top and bottom of the door and into which an entraining bolt 22 connected with the dead bolt 4 of the door lock 3 is engageable. The opening 21 is substantially an elongate hole open at one of its ends so that the entraining bolt 22 is introduceable during the assembly of the door lock 3. The entraining bolt 22 is arranged in the elongate hole 21 in such a manner that the elements 17 and 18 are entrained only on the displacement of the dead bolt 4 into a locking position by the entraining bolt 22 engaging the wall of the opening 21.

A jamb 24 is disposed at the lock side of a door frame 23, and comprises hollow metallic sections manufactured by for example folding or extruding. The jamb 24, which is provided with a longitudinally extending channel encompasses the adjacent border of the door opening and is anchored in masonry 28 by means of tongues 25 and screws 26 and 27. Arranged in the jamb 24 is a longitudinally extending channel 29, which extends over the entire height of the door and in which the displaceable member 16 comprising the elements 17 and 18 is, on displacement of the dead bolt 4 into its locking position, engageable almost free of play.

The parts 1, 2, 23 and 28 in the Figs. 1 to 4 are designated by the same numerals in the Fig. 5. A jamb 30 at the hinged edge portion of the door frame 23 is provided with a longitudinally extending channel encompassing the border of the door opening and is anchored in the masonry 28 by means of tongues 31 and screws 32. A hinge 33 disposed on the inside of the door is welded to the door 1 and to the jamb 30. Arranged in the jamb 30 is a longitudinally extending channel 34, which extends over the entire height of the door and in which the door 1 is engageable when closed. To avoid a gap between the door 1 and the channel 34 when the door is closed, the outside edge of the door 1 has a bevel 35 over its entire height, the channel 34 having a wall surface portion which is parallel to the bevel.

The borders of the door opening encompassed by the jambs 24 and 30 are so

stepped that the inner horizontal clear width of the door opening is greater than the outer, the jambs 24 and 30 conforming to this stepped shape of the borders (Figs. 3, 4 and 5).

Advantages of the above described embodiment are that the dead bolt 4 of the door lock 3 and the hinges 33 are relieved of external forces acting on the door 1, since these are absorbed in the channels 29 and 34 of the door frame 23, so the door 1 is less likely to be broken open by the usual methods applied in burglary. The gap avoided between the door 1 and the channel 34 by the configuration of the outside edge of the door 1 at the hinged edge portion and the stepped configuration of the border of the door opening render the effective application of a burglary tool difficult. A further advantage is that if the displaceable member 16 becomes fixed by being wedged in its locking position the door 1 can be opened from inside in that the housing 11, which contains the door lock 3 and which is inserted in the recess 12, may be screwed out after removing the cover 2.

#### WHAT WE CLAIM IS:—

1. An assembly of a door hinged at or near one vertical edge portion thereof and a door frame comprising two jambs each provided with a longitudinally extending channel, the door when shut having said one edge portion extending within and being closely adjacent side wall portions of the channel of one jamb, and being provided with a bolt at or in an edge portion of the door opposite said one edge portion, and a door member at least partially disposed at or in the opposite edge portion and displaceable to extend within and closely adjacent side wall portions of the channel of the other jamb, the door member being elongate and extending along substantially the length of the channel.

2. An assembly as claimed in claim 1, wherein the frame comprises hollow metal sections.

3. An assembly as claimed in either claim 1 or claim 2, wherein the door comprises hollow metal sections provided with cladding.

4. An assembly as claimed in any one of the preceding claims, wherein the displaceable member comprises two elongate elements each pivotably mounted at a respective one of two opposite end portions of the displaceable member in a channel provided in said opposite edge portion of the door, each element being provided with a mutually aligned opening engaged by an entraining member connected to the bolt.

5. An assembly as claimed in claim 4, wherein the mutually aligned openings are situated approximately mid-way between the end portions of the displaceable member.

6. An assembly as claimed in either claim 4 or claim 5, wherein the mutually aligned openings define an elongate recess and the entraining member is so connected to the bolt that displacement of the bolt from a non-locking position to a locking position causes the displaceable member to project into the channel in the associated jamb.

7. An assembly as claimed in any one of claims 4 to 6, wherein the door comprises in one major side face a recess containing a housing in which is disposed a locking mechanism, the housing having a wall portion which together with a wall portion of the recess defines the channel in said opposite edge portion of the door.

8. An assembly as claimed in claim 7, wherein the housing is detachably received in the recess.

9. An assembly as claimed in any one of the preceding claims, wherein the door is arranged to be closable in only one direction and the major side face of the door facing the closing direction is provided with a bevelled portion and the channel of the said one jamb has a wall surface portion which is parallel to the bevelled portion when the door is shut.

10. An assembly as claimed in any one of the preceding claims, wherein the jambs are each provided with a further longitudinally extending channel opening in the opposite direction to that of the respective first mentioned channel of the jamb.

11. An assembly as claimed in any one of the preceding claims, wherein the said other jamb is provided with a longitudinally extending shoulder providing a stop surface for the door when closed.

12. A hinged door and door frame assembly substantially as hereinbefore described with reference to the accompanying drawings.

13. A kit of parts for manufacturing the assembly as claimed in any one of the preceding claims, comprising the door and the two elongate members each intended to constitute a respective jamb, one member being provided with a longitudinally extending channel of such size and configuration that it has side wall portions which will be closely adjacent the said one edge of the door when shut, and the other member being provided with a longitudinally extending channel of such size and configuration that it has side wall portions which will be closely adjacent the portion of the displaceable member intended to extend within the associated channel when the door is shut.

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stepped that the inner horizontal clear width of the door opening is greater than the outer, the jambs 24 and 30 conforming to this stepped shape of the borders (Figs. 3, 4 and 5).

Advantages of the above described embodiment are that the dead bolt 4 of the door lock 3 and the hinges 33 are relieved of external forces acting on the door 1, since these are absorbed in the channels 29 and 34 of the door frame 23, so the door 1 is less likely to be broken open by the usual methods applied in burglary. The gap avoided between the door 1 and the channel 34 by the configuration of the outside edge of the door 1 at the hinged edge portion and the stepped configuration of the border of the door opening render the effective application of a burglary tool difficult. A further advantage is that if the displaceable member 16 becomes fixed by being wedged in its locking position the door 1 can be opened from inside in that the housing 11, which contains the door lock 3 and which is inserted in the recess 12, may be screwed out after removing the cover 2.

#### WHAT WE CLAIM IS:—

1. An assembly of a door hinged at or near one vertical edge portion thereof and a door frame comprising two jambs each provided with a longitudinally extending channel, the door when shut having said one edge portion extending within and being closely adjacent side wall portions of the channel of one jamb, and being provided with a bolt at or in an edge portion of the door opposite said one edge portion, and a door member at least partially disposed at or in the opposite edge portion and displaceable to extend within and closely adjacent side wall portions of the channel of the other jamb, the door member being elongate and extending along substantially the length of the channel.

2. An assembly as claimed in claim 1, wherein the frame comprises hollow metal sections.

3. An assembly as claimed in either claim 1 or claim 2, wherein the door comprises hollow metal sections provided with cladding.

4. An assembly as claimed in any one of the preceding claims, wherein the displaceable member comprises two elongate elements each pivotably mounted at a respective one of two opposite end portions of the displaceable member in a channel provided in said opposite edge portion of the door, each element being provided with a mutually aligned opening engaged by an entraining member connected to the bolt.

5. An assembly as claimed in claim 4, wherein the mutually aligned openings are situated approximately mid-way between the end portions of the displaceable member.

6. An assembly as claimed in either claim 4 or claim 5, wherein the mutually aligned openings define an elongate recess and the entraining member is so connected to the bolt that displacement of the bolt from a non-locking position to a locking position causes the displaceable member to project into the channel in the associated jamb.

7. An assembly as claimed in any one of claims 4 to 6, wherein the door comprises in one major side face a recess containing a housing in which is disposed a locking mechanism, the housing having a wall portion which together with a wall portion of the recess defines the channel in said opposite edge portion of the door.

8. An assembly as claimed in claim 7, wherein the housing is detachably received in the recess.

9. An assembly as claimed in any one of the preceding claims, wherein the door is arranged to be closable in only one direction and the major side face of the door facing the closing direction is provided with a bevelled portion and the channel of the said one jamb has a wall surface portion which is parallel to the bevelled portion when the door is shut.

10. An assembly as claimed in any one of the preceding claims, wherein the jambs are each provided with a further longitudinally extending channel opening in the opposite direction to that of the respective first mentioned channel of the jamb.

11. An assembly as claimed in any one of the preceding claims, wherein the said other jamb is provided with a longitudinally extending shoulder providing a stop surface for the door when closed.

12. A hinged door and door frame assembly substantially as hereinbefore described with reference to the accompanying drawings.

13. A kit of parts for manufacturing the assembly as claimed in any one of the preceding claims, comprising the door and the two elongate members each intended to constitute a respective jamb, one member being provided with a longitudinally extending channel of such size and configuration that it has side wall portions which will be closely adjacent the said one edge of the door when shut, and the other member being provided with a longitudinally extending channel of such size and configuration that it has side wall portions which will be closely adjacent the portion of the displaceable member intended to extend within the associated channel when the door is shut.

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