Aug. 9, 1938. J. G. MITCHELL 2,126,127

DOOR HINGE

Filed Aug. 19, 1936

Fig. 1.

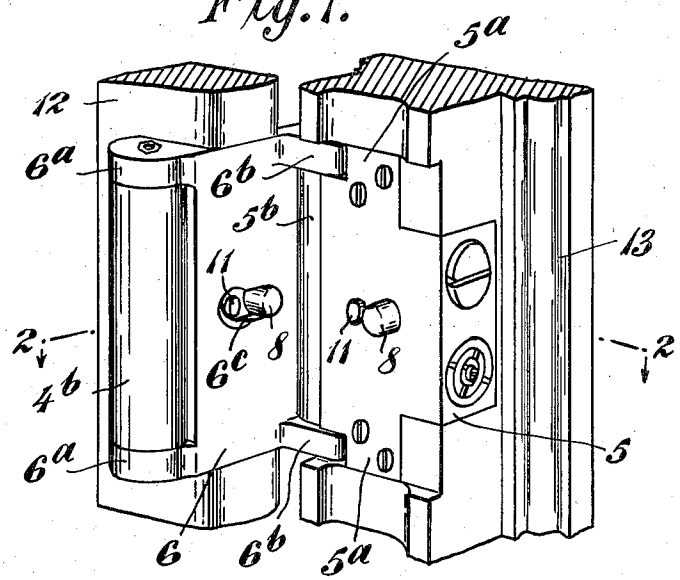


Fig. 2.

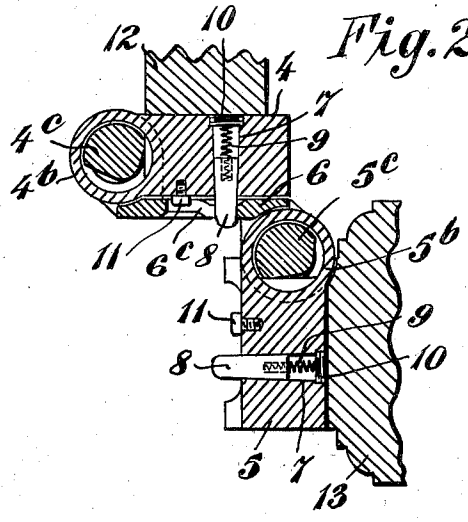
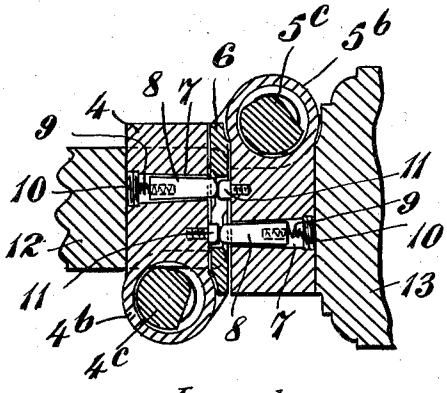


Fig. 3.



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DOOR HINGE

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In Great Britain January 17, 1936

2 Claims. (Cl. 16—163)

This invention relates to door hinges and more particularly is concerned with hinges of the construction commonly known as double acting, that is to say, to hinges which permit the door or the like whereon they are provided to swing in either direction in its opening motions.

Double acting hinges ordinarily embody three members two of which, hereinafter referred to as the leaf members, are or may be of similar formation and are adapted to be screwed or otherwise fixed the one to the door and the other to the jamb thereof, while the third member, which is hereinafter termed the intermediate member, is located between these leaf members and has a pivotal connection at one of its side edges with the leaf member fixed to the door and at its other side edge a like connection with the leaf member fixed to the door jamb, and these leaf members so co-act that when the door is moved to open in one direction it turns about the pivotal connection of the intermediate member with the leaf member fixed to the door, while when it is moved to open in the other direction it turns about the pivotal connection of the said intermediate member with the leaf member which is fixed to the jamb.

In whichever direction the door is being turned it is very desirable that its angular motion shall be performed about one only of the pivots of the double acting hinge, since motion about both pivots in one and the same turning operation would result in undesirable displacement of the door.

The present invention has for its object to ensure that in whichever direction a door furnished with double acting hinges performs its angular opening motion, the motion takes place about the appropriate pivot, angular motion about the other pivot being meanwhile restrained or prevented, so that no undesirable displacement of the door results.

The invention consists in the provision in double acting hinges of means for attaining the object aforesaid, said means embodying the combination with each of the leaf members of a spring pressed bolt-like or equivalent device or devices adapted so to co-act with the intermediate member as to lock the said intermediate member to one or other of the said leaf members according to the direction in which the door is being turned.

A convenient embodiment of the invention will now be described with reference to the accompanying drawing in its application to double acting hinges of the kind or type described and illustrated in the specification of my British Letters Patent No. 396,889 and U. S. Patent No. 1,975,430, October 2nd, 1934.

Figure 1 is a perspective view of a double acting hinge of the said type embodying the improvements constituting the present invention, portions only of the door and door jamb to which the hinge is applied being represented, the parts being shown in the position which they occupy when the door has been moved into an open position by turning it on that pivot pin which is carried by the leaf member attached to the jamb.

Figure 2 is a horizontal section on the plane indicated by the dotted lines 2—2, Figure 1, showing the parts in the same position as in the said Figure 1.

Figure 3 is a horizontal section on the same plane showing the parts in the relative positions which they occupy when the door is closed.

The same numerals of reference indicate the same parts in the several figures.

As in the constructions described in the aforesaid specification the double acting hinge represented has combined therewith either spring and hydraulic check devices or simply hydraulic check devices not seen in the figures and operates to effect a self-closing action of the door whereon it is furnished, each of the leaf members comprising a block-like part denoted respectively by the references 4 and 5 the said block-like parts being provided with fixing lugs such as are seen at 5^a in Figure 1 and having at one side thereof a cylindrical chamber marked respectively 4^b and 5^b wherein the pivots 4^c and 5^c which effect the connection of the chambered parts 4^b and 5^b of the leaf members 4 and 5 with the lugs 6^a and 5^b on the upper and lower corners of the respective sides of the intermediate member 6, are located, the said block-like parts 4 and 5 having therein cylindrical chambers, not shown, disposed in horizontal parallel planes transverse to the pivot containing cylinders and serving to accommodate the controlling springs, or spring and check devices, which co-act with the pivot member or members to control the turning motions of the door in a manner well understood.

In the application of the present invention to hinges of the aforesaid type or construction the block-like parts 4 and 5 of each of the leaf members is provided with a bore 7 the axis whereof is disposed in a plane transverse to the plane which contains the axes of the cylindrical chambers in which the check devices are located.

The said bore 7 in each leaf member is fitted with a sliding pin or bolt 8 which, under the action of a spring 9 located in the bore is made to pro-

trude from the bore on that side or face of the block-like part which is presented to the intermediate member **6** in the folded condition of the hinge, and the said intermediate member **6** is furnished with a slot **6c** (or slots) with which the ends of the spring pressed pins or bolts **8** can be engaged to effect a temporary locking of one or other leaf member to the intermediate member **6** by causing the ends of the spring pressed pins or bolts **8** when engaged within the slot **6c** to protrude to an extent which prevents their withdrawal from the slot **6c** by a hinging movement until the said spring pressed pins or bolts **8** have been partially pressed within their bores.

The spring pressed pins or bolts **8** are preferably slightly tapered or conical in form as seen in the sectional views, the portions of the bores wherein they are located being correspondingly tapered, this tapering of the parts serving to limit the extent to which the acting ends of the pins or bolts can be protruded from the face of the respective leaf members and preventing their complete withdrawal from the bores **7** after assembly therein, the assembly being effected by introducing the pins or bolts into the bores from the ends thereof opposite to that from which their acting ends protrude, then inserting the controlling springs **9** into the bores and closing the ends of the bores through which the bolts and springs have been introduced by a screw disc or plug **10**, the said ends of the bores being made cylindrical for a short part of the length of the bore and provided with a screw thread to receive the closing disc or plug **10**. The closing disc or plug **10** provides in each case an abutment for the outer end of the spring **9** and may be adjustable in the threaded part of the bore for regulation of the spring pressure on the bolt.

The block-like parts **4** and **5** of the leaf members are each provided, on the face thereof which is presented to the respective faces of the intermediate member **6** when the hinge is in the folded condition, with a fixed projection or stud **11**, these fixed projections or studs **11** being so disposed that when the hinge is in the said folded condition represented in Figure 3 they project partially into the slot **6c** (or slots), with which the protruding ends of the spring pressed sliding pins or bolts **8** carried by the leaf members are adapted to enter into locking engagement as aforesaid, the fixed projection or stud **11** on the one leaf member co-acting with the spring pressed bolt **8** carried by the other leaf member, the spring pressed bolts of the respective leaf members being thereby pressed inwardly in the bores in which they are located, as is shown in the said Figure 3, and thus permitting the parts to assume the completely folded condition. Further this inward pressing of the bolts **8** prevents them from assuming such an interlocking position in relation to the intermediate member **6** as would interfere with the proper turning motions of the door.

On the turning of the door the portion of which shown is denoted by the reference **12** for opening it in one or other direction the movement of the member **4** carried by the door relative to the member **5** mounted on the jamb marked **13** displaces the fixed studs **11** on the members from their bearing contact on the respective sliding bolts **8** and the said bolts are permitted to move outwardly under the action of their springs.

When the turning motion of the door **12** takes place about the pivot **5c** located in the chamber **5b** of the leaf member **5** which is fixed to the door jamb **13** the spring pressed bolt **8** carried by the member **4** mounted on the door **12** assumes a locking position in the slot **6c** in the intermediate member **6** as is seen in Figure 2, while when the said motion takes place about the pivot **4c** located in the chamber **4b** of the leaf member **4** fixed on the door **12**, the spring pressed bolt **8** carried by the leaf member **5** which is mounted on the door jamb **13** will assume a locking position in the said slot **6c** of the intermediate member **6**, and hence in whichever direction the door is opened its movement is restricted to an angular motion on one or other only of the pivots and no undesirable displacement of the door can take place while the intermediate member is thus locked to one or other of the leaf members, according to the direction in which the door is turned in the opening operation.

Although the invention has been more particularly described in its application to double acting hinges such as are described in the aforesaid prior patent specification it is to be understood that it is applicable to double acting hinges generally.

What I claim is:—

1. A double acting hinge comprising a leaf member adapted to be fixed to the door, a leaf member adapted to be fixed to the door frame, an intermediate member having a pivotal connection with each leaf member, a protruding locking means embodied in each leaf member, locking means complementary to said protruding locking means incorporated in the intermediate member and means provided on each leaf member for moving the protruding locking means of the complementary leaf member into an unlocking position when the leaf members are brought into abutment with the intermediate member and for permitting the protruding locking means of a leaf member to assume automatically the locking position when the complementary leaf member is turned away from the intermediate member.

2. A double acting hinge comprising a leaf member adapted to be fixed to the door, a leaf member adapted to be fixed to the door frame, an intermediate member having pivotal connection with each leaf member, a spring pressed plunger locking means incorporated with each leaf member, locking slots complementary to said plunger locking means incorporated in the intermediate member, a projecting means on each leaf member adapted to bear on the plunger locking means of the complementary leaf member when the said leaf members are turned into abutment with the intermediate member to reduce the extent of protrusion of the said plunger locking means and thereby to permit of the unlocking of either leaf member and to provide for the plunger locking means of one leaf member to assume automatically the locking position when the complementary leaf member is turned out of abutment with the intermediate member.

JAMES GARTH MITCHELL.