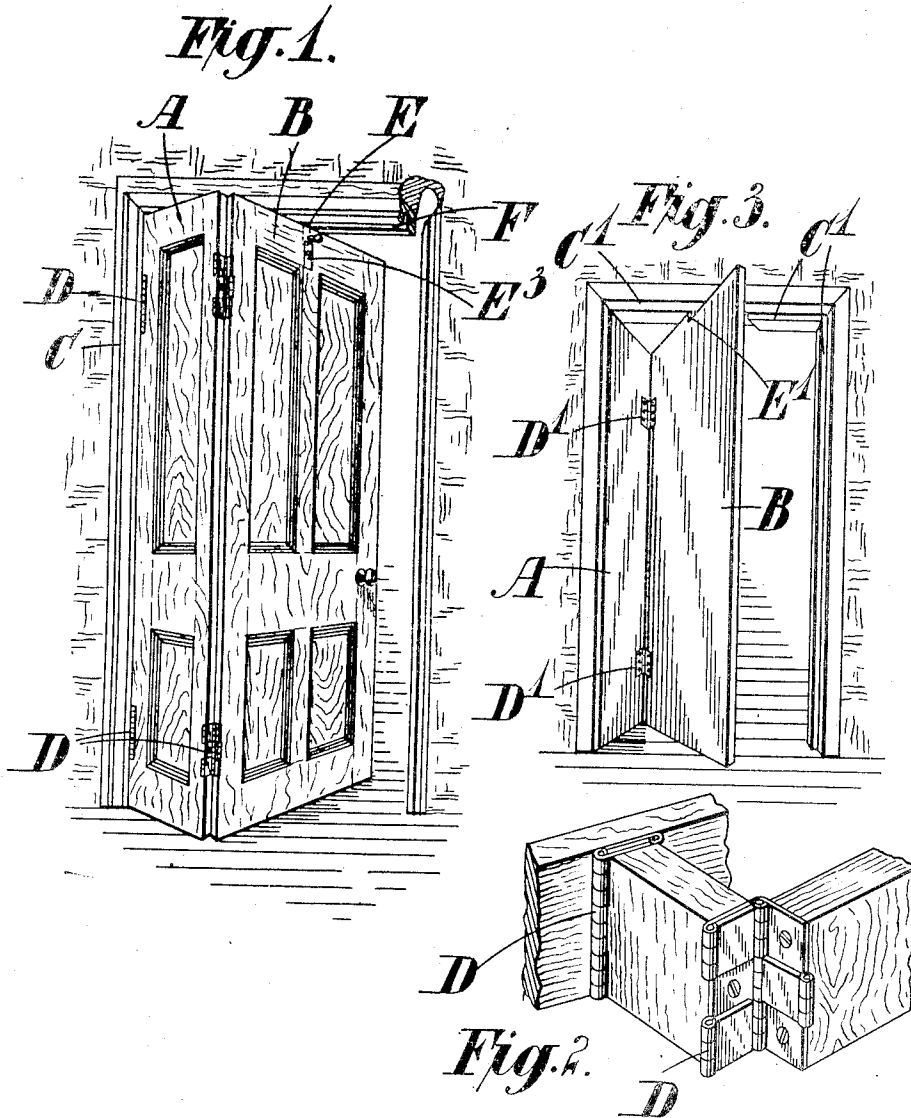


W. W. TAYLOR.
DOOR, WINDOW, AND THE LIKE.
APPLICATION FILED APR. 22, 1904.

3 SHEETS—SHEET 1.

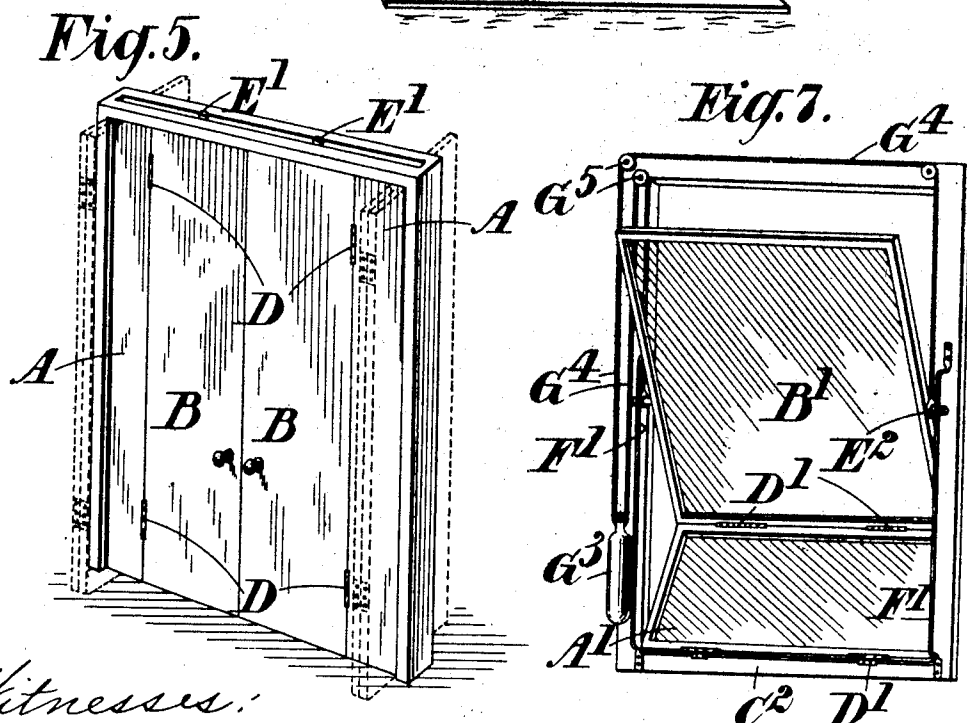
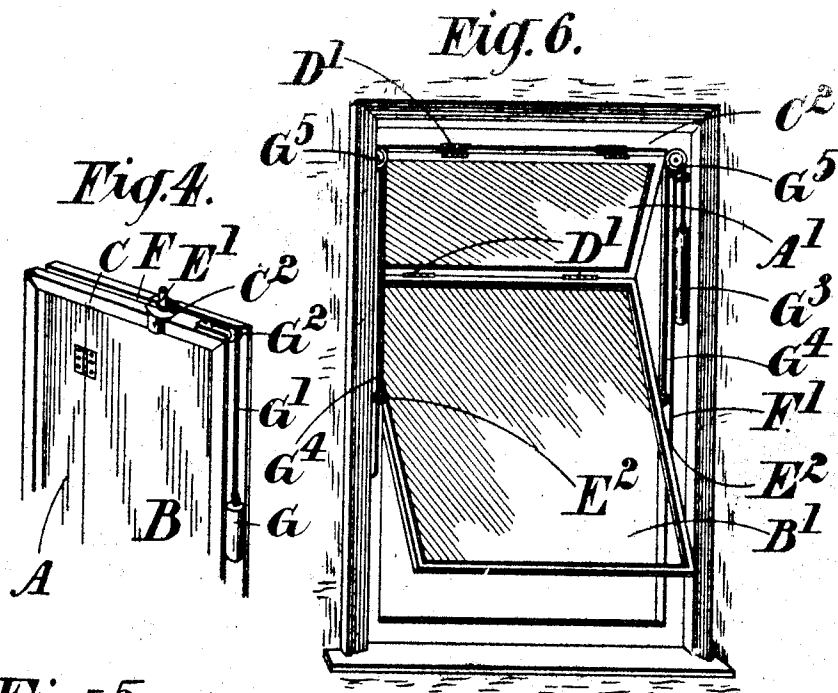


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3 SHEETS—SHEET 2.



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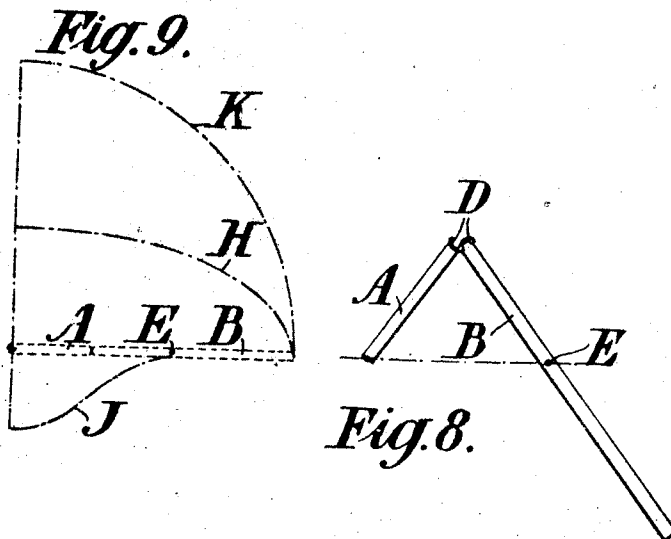
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No. 821,201.

PATENTED MAY 22, 1906.

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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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DOOR, WINDOW, AND THE LIKE.

No. 821,201,

Specification of Letters Patent.

Patented May 22, 1906.

Application filed April 22, 1904. Serial No. 204,418.

To all whom it may concern:

Be it known that I, WILLIAM WILBERFORCE TAYLOR, a subject of the King of England, residing at Oxford, England, have invented certain new and useful Improvements in Doors, Windows, and the Like, of which the following is a specification.

This invention relates to doors or windows, and provides a method of so making a folding door or window that the pressure of the wind on the two parts is balanced or nearly balanced and that the tendency of the door or window to slam, owing either to a draft or to a sudden gust of wind, is much reduced. This arrangement also to a great measure prevents the opening of the door or window from disturbing the air except in the immediate neighborhood of the said door or window and from itself causing a draft in the room or passage into which it opens, a feature which is most obnoxious in many public buildings. The method in which this is effected may be described as follows: The door or window is hinged to the side of the opening in which it acts by a line of hinges called below the "first line of hinges." The door or window consists of two parts or members hinged together in the manner used in making a folding screen by a line of hinges, called below the "second line of hinges" parallel to the first line of hinges. The part between the first and second lines of hinges is preferably about two-sevenths of the whole width of the door or window. At the same distance as this from the second line of hinges a pin or bolt parallel to the lines of hinges extends into a fixed straight slot that runs along either of the sides of the door or window perpendicular to the line of hinges when the door or window is shut and causes that part of the door or window to move always in the plane that is occupied by the door or window when shut. The part of the door or window between the bolt and the first line of hinges thus moves inward when the outer part away from the hinges moves outward, and vice versa. Thus the air displaced by the door or window on the two sides of it is to a great extent equalized and instead of a displacement of air all in one direction inward or outward by the swinging of the door or window only an eddy in the immediate neighborhood of the door or window is caused; but what in many cases is a more important consideration the wind-pressures on the two parts of the door also equalize one another, or

nearly so, when the door is being opened or shut in a wind.

The bolt may be either fixed to the door or so attached to it as to be capable of being withdrawn from the slot by pulling a handle. It may also have a traveling attachment capable of moving along the slot into which it fits, which may be used to minimize friction or to furnish an attachment for a self-closing arrangement, such as a simple form of a Norton door-check, or to attach the end of a cord or chain running over a pulley and connected at the other end with a weight.

If it is only desired to open the door or window on one side—i. e., so that the second line of hinges goes either inward always or always outward and not both ways—the door or window can have attached to it wind-guards that will close the cracks at the top and at the bottom and at the sides of the door when shut. If otherwise, close-fitting will have to be relied upon or any other device suitable to ordinary swing-doors. The ordinary forms of lock and handle for doors can be placed on the side of the door remote from the first line of hinges and can be operated in the usual manner.

A door so made requires less space to move in than an ordinary swing-door. Instead of covering a semicircle round its first line of hinges it covers a semi-ellipse, of which the semimajor axis is represented by the door when shut, and the semiminor axis is about three-sevenths of this length.

Modifications in the details of construction may be made without departing from the spirit of this invention.

In the accompanying drawings, Figures 1, 3, 4, 5, 6, and 7 show in perspective various doors and windows, all according to this invention. Fig. 2 shows in perspective details of the hinges in Fig. 1. Fig. 8 is a plan showing a modified form of hinge, and Fig. 9 is a diagram illustrating the amount of space occupied in the opening of a door according to this invention.

Like letters indicate like parts throughout the drawings.

With reference first to Fig. 1, the door comprises two parts A and B, the part A being hinged to the framing C and to the adjacent part B by hinges D, capable of allowing movement in both directions. A convenient form of hinge for the purpose is shown in Fig. 2, but needs no particular description, as it is

well known as a "double screen-hinge." The part B of the door is provided with a bolt E, projecting up into a slot F in the top framing of the doorway. This bolt E is shown, by way of example, as supported upon a block E³ beneath it, so that if the block be taken out the bolt may be withdrawn from the slot F. The distance between the bolt E and the second line of hinges—that is to say, the hinges connecting the part A with the part B—is preferably equal to the distance between the two lines of hinges, that distance itself being conveniently approximately two-sevenths of the whole width of the door.

The door illustrated in Figs. 3 and 4 is intended to open in one direction only. Hence ordinary hinges D' may be employed to connect the parts A and B, and a rabbet C' can be fixed to the framing to exclude drafts when the door is shut. From the way in which the improved door opens it will of course be necessary to have the rabbet partly on one side and partly on the other side of the framing. For instance, as shown in Fig. 3, the projecting part of the rabbet C' for the part A and for the part B between the second line of hinges and the bolt E' would be on the near side of the framing, while that for the remainder of the part B would be on the remote side of the framing.

Fig. 4 shows the same door closed and also illustrates one method of making it self-closing. This is accomplished by means of a weight G, attached to a cord G¹, which passes over a pulley G² and is attached to the bolt E', which in this case is in the form of a fixed pin. In order to be able to withdraw the door bodily from the framing C when required, the upper part of the framing is provided with a rotatable block C², slotted to form a continuation of the slot F, in which the pin E' moves. When the door is closed, as shown in Fig. 4, the block C² may be turned about the pin E' as a center, so that its slotted portion opens to the outside of the framing, and the door can then be removed. It will be understood that this is simply a construction to avoid making the bolt to slide up and down, as in the form shown in Fig. 1.

In Fig. 5 double doors A B are shown, and their position when each is opened to its fullest extent is indicated in dotted lines. It will be seen that in this position the doors occupy very little space.

Fig. 6 shows a window according to this invention constructed on lines broadly similar to the doors previously mentioned. The upper sash A' is hinged to the lower sash B' and to the top of the window-frame C². The lower sash is provided with fixed pins E², which are shown, by way of illustration, as moving in guides F', attached to the window-frame. In this construction the weight of the window is balanced or partly balanced by weights G³. One of these is shown attached

to a cord G⁴, which passes over a pulley G⁵ and is connected to the pin E². A similar arrangement is provided on the other side of the window.

The window illustrated in Fig. 7 is generally similar to that described with reference to Fig. 6; but the smaller sash A' is hinged to the bottom of the framing C². In this construction one weight G³ only is used and operates, as shown, upon both the pins E².

It will be understood that windows and doors according to this invention may be provided with various known forms of devices for checking their too-sudden movement. For example, the pin or bolt which moves in the slot or guide might be connected with the piston of an air or other dash pot. These points are, however, not illustrated in the drawings.

Fig. 8 is a plan of a door having its parts A B hinged so as to avoid as far as possible any draft between them. This is done by making the adjacent portions of the parts A and B concave and convex, respectively, and suitably shaping the parts of the hinges D. It will be seen that when the door opens only one way a strip of light wood or other draft-preventer may be provided.

Although Figs. 6 and 7 illustrate windows hinged about horizontal lines, it will of course be understood that this need not necessarily be the case. For example, the construction shown as a door in Fig. 5 is very suitable for use as a window, in which case the height of the frame would probably be reduced in proportion to its width.

The diagram forming Fig. 9 shows two parts A B of a door according to this invention, and the dotted line H indicates the path which the edge of the part B takes when the door is opened, the line J indicating the limit beyond which no part of the door projects on the other side. The dotted line K is part of a circle having a radius equal to the width of the door, and thus indicates the path of movement of the edge of an ordinary door having the same dimensions. From this diagram it can be seen by inspection that the disturbance of the air in a room caused by the opening of a door according to this invention is very much less than that produced by opening a door of the ordinary type.

It can be shown mathematically that if the parts of the door are proportioned as hereinbefore described the door as a whole will be substantially in equilibrium for uniform wind-pressure when shut or nearly shut. If it be desired to have the door or window in equilibrium under uniform wind-pressure when open or partially open, the proportions may be modified accordingly.

It will be understood that the details of construction given in the accompanying drawings are merely by way of example and may be varied without departing from the

spirit of this invention. For instance, the framing containing the slot F for the pin or bolt may be provided with an opening through which the bolt can be withdrawn when required, this opening being normally closed, say, by a sliding plate. Again, the doors when self-closing need not necessarily be operated by a weight, but may have any convenient form of spring-closing mechanism, or when a weight is used instead of being connected to the pin or bolt by means of a cord, as illustrated, it can be directly attached to the bolt in any convenient way and arranged to run on an inclined plane—say on guide-rails fixed to the top framing of the door.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a door or window frame, of a door or window consisting of two members having unequal proportions, a line of hinges connecting one of said members with a side of the frame, a second line of hinges connecting the two members together, the distance between the two lines of hinges being approximately two-sevenths of the distance between the edge of the member which is hinged to the frame and the parallel free edge of the other member whereby the door or window will be substantially in equilibrium for uniform wind-pressure when shut or nearly shut, a projection on the larger member of the door or window at a distance from the second line of hinges equal to the distance between the two lines of hinges and a guide in the frame within which said projection engages and is adapted to slide for the purpose specified.

2. The combination with a door or window frame, of a door or window consisting of two members having unequal proportions, a line of double swing-hinges connecting one of said members with a side of the frame, a second line of double swing-hinges connecting the two members together, the distance between the two lines of hinges being approximately two-sevenths of the distance between the edge of the member which is hinged to the frame and the parallel free edge of the other member whereby the door or window will be substantially in equilibrium for uniform wind-pressure when shut or nearly shut, a projection on the larger member of the door or window at a distance from the second line of hinges equal to the distance between the two

lines of hinges and a guide in the frame within which said projection engages and is adapted to slide for the purpose specified.

3. The combination with a door or window frame, of a door or window consisting of two members having unequal proportions, a line of hinges connecting one of said members with a side of the frame, a second line of hinges connecting the two members together, the distance between the two lines of hinges being approximately two-sevenths of the distance between the edge of the member which is hinged to the frame and the parallel free edge of the other member whereby the door or window will be substantially in equilibrium for uniform wind-pressure when shut or nearly shut, a projection on the larger member of the door or window at a distance from the second line of hinges equal to the distance between the two lines of hinges, a guide in the frame within which said projection engages and is adapted to slide, and means for excluding draft between the framing and the edges of the door as and for the purpose specified.

4. The combination with a door or window frame, of a door or window consisting of two members having unequal proportions, a line of hinges connecting one of said members with a side of the frame, a second line of hinges connecting the two members together, the distance between the two lines of hinges being approximately two-sevenths of the distance between the edge of the member which is hinged to the frame and the parallel free edge of the other member whereby the door or window will be substantially in equilibrium for uniform wind-pressure when shut or nearly shut, a projection on the larger member of the door or window at a distance from the second line of hinges equal to the distance between the two lines of hinges, a guide in the frame within which said projection engages and is adapted to slide, and automatically-operating means for closing or balancing the door or window.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM WILBERFORCE TAYLOR.

Witnesses:

H. W. BATES,
FRANK EMERY.