May 7, 1940. N. E. GRIFFIN 2,199,562

WINDOW CONSTRUCTION

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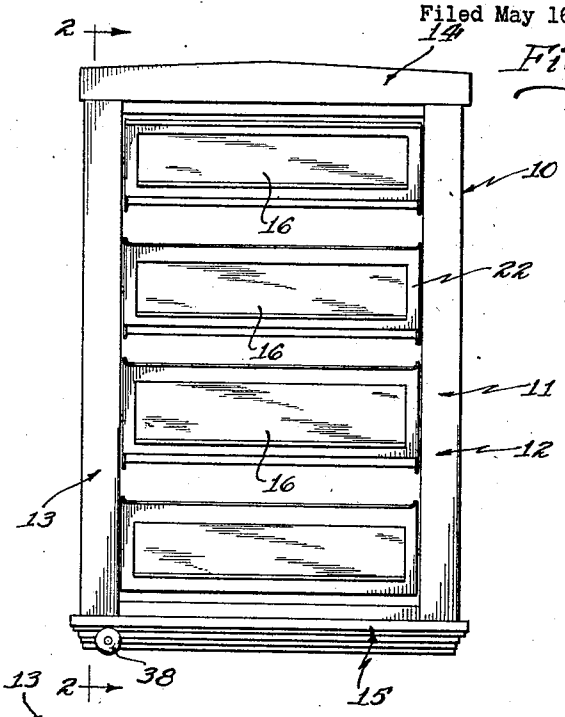
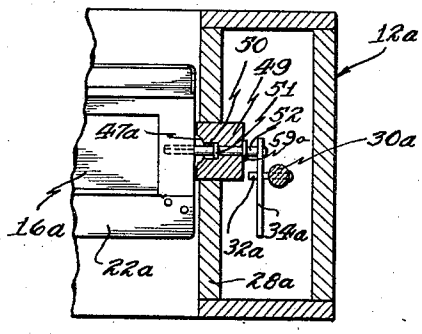


Fig. 1

Fig. 6



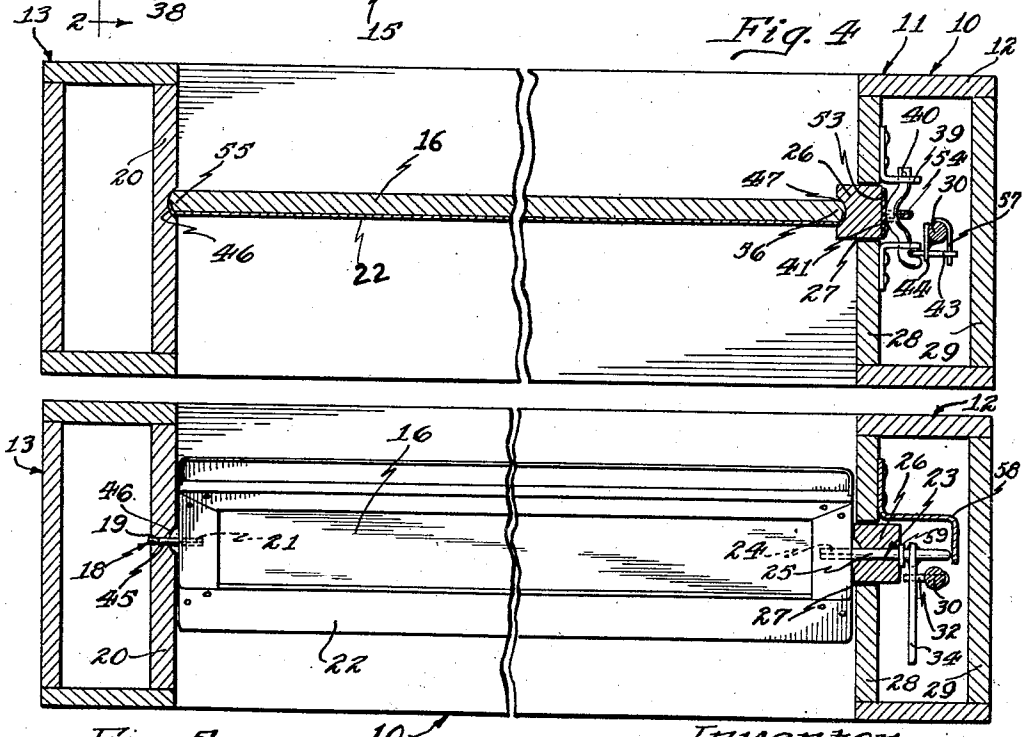


Fig. 4

Fig. 5

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Fig. 3

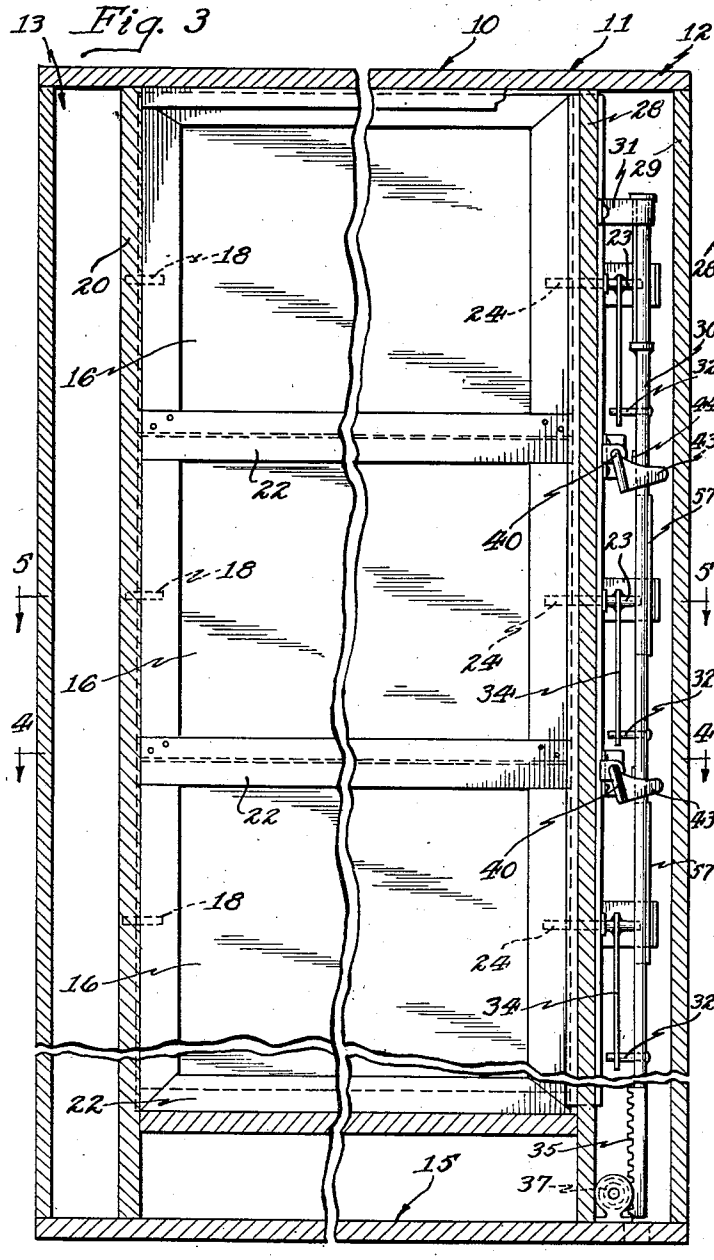
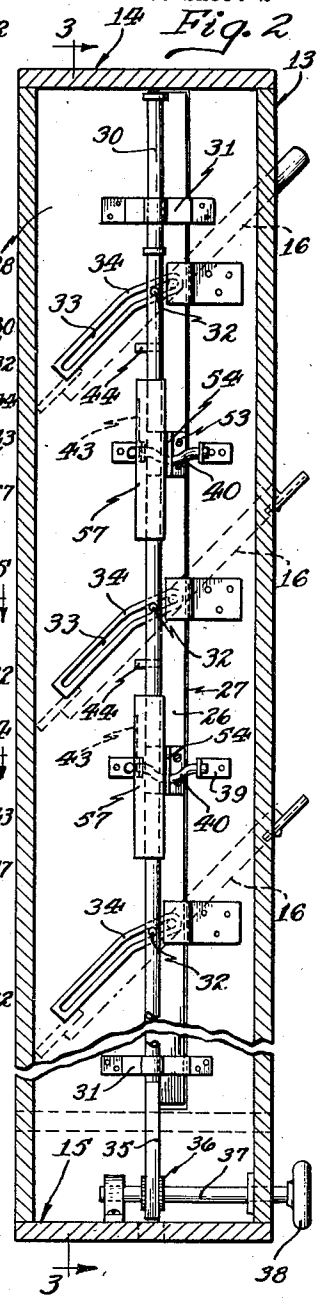


Fig. 2



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2,199,562

WINDOW CONSTRUCTION

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Application May 16, 1939, Serial No. 273,949

5 Claims. (Cl. 20—53)

This invention relates to a window construction.

More particularly, this invention relates to a window construction of the type which includes a plurality of window sections or panes each of which is adapted to be swung or pivoted about a horizontally extending axis into open and closed position and which window construction includes means for weather-stripping the window panes or sections when the latter are in closed position.

Window constructions of the type which include a plurality of window sections or panes which are adapted to be swung or pivoted about horizontally extending axes are well known and are particularly useful in such places as factories, public buildings, office buildings, sun rooms and the like.

However, one difficulty which has been experienced with window constructions of this nature has been the difficulty involved in weather-stripping the same and this has been due to the fact that the window sections or panes are movable and require clearance or space to enable them to be moved into and out of open and closed positions and this has, to a large extent, prevented them from being properly or adequately weather-stripped.

Accordingly, an object of the present invention is to overcome the foregoing and other objects which have been experienced in the use of the prior art window constructions of the character embodying a plurality of window sections or panes pivotally or hingedly movable about horizontally extending axes into and out of open and closed positions.

Another object of the present invention is to provide a window construction embodying a plurality of window panes or sections which are adapted to be swung about horizontally extending axes into and out of open and closed positions, and which window construction embodies novel means for effectively weather-stripping the window panes or sections when the latter are in closed position.

The new window construction embodies a movable weather strip which is adapted to engage one side or vertically extending marginal edge portion of each of the window panes or sections, when the latter are in closed position, together with means for moving this weather-strip out of engagement with the said marginal edge portion of each of the window panes or sections.

Another object of the present invention is to construct the new window construction in such a manner that the means for moving the window panes or sections into and out of open and closed positions and the means for moving the weather-strip into and out of effective position are controlled by a common manually operable control member.

An additional object of the invention is to construct the same in such a manner that when the common manually operable control member for the window pane-moving means and the weather-strip-moving means is operated to effect the window opening operation it first cooperates with said weather-strip-moving means to move the latter out of engagement with the window panes or sections and subsequently cooperates with the window pane-moving means to move the window panes into open position, whereas when the said manually operable control member is operated to effect the window closing operation it first cooperates with the window pane-moving means to move the window panes into closed position and subsequently cooperates with the weather-strip-moving means to move the weather-strip into effective or weather-stripping engagement with the window panes.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction and in which:

Fig. 1 is an elevational view showing a preferred form of the new window construction, as seen from the inside thereof, and showing the window panes or sections in open position;

Fig. 2 is an enlarged vertical sectional view on line 2—2 in Fig. 1;

Fig. 3 is an enlarged vertical sectional view on line 3—3 in Fig. 2 but showing the window in closed position;

Fig. 4 is a transverse or horizontal sectional view on line 4—4 in Fig. 3 showing the window panes or sections in closed position and showing part of the operating means for the movable weather-strip;

Fig. 5 is a transverse or horizontal sectional view on line 5—5 in Fig. 3 showing the window panes in partially open position and showing the movable weather-strip moved out of engagement with the window panes; and

Fig. 6 is a fragmentary sectional view illustrating a modified form of one feature of the new window construction.

A preferred form of the new window construction is illustrated in Figs. 1 to 5, inclusive, of the

drawings, is therein generally indicated at 10, and comprises a window frame 11 which may be made in any suitable designs and in various materials such as wood, metal and the like, inasmuch as the particular design of the window frame is not essential to the present invention.

The particular form of the window frame 11 which is illustrated in Figs. 1 to 5, inclusive, of the drawings includes a pair of box-like housings 12 and 13 which form the sides or side walls of the frame, a top wall 14, and a bottom wall or sill 15.

The new window construction includes one or more window sections or panes 16 which may be made of any suitable light-penetrable material such, for example, as glass, and each of which is mounted in a frame 22 which may be made of wood, metal or other suitable material. The window panes or sections 16 and their frames 22 are adapted to be swung or pivoted about horizontally extending axes into and out of open and closed positions in a manner and by means which will be described presently.

Each of the movable window panes or sections 16 is pivotally or hingedly mounted at one end upon a horizontally extending pintle or trunnion 18 (Fig. 5), and each of these pintles or trunnions 18 is slidably mounted in an aperture or recess 45 which is formed in the wall 20 of the housing 13.

Each of the pintles or trunnions 18 also includes an inner end portion 19 which projects into and is rigidly secured in an aperture which is formed in the corresponding frame 22.

Each of the window pane sections or units 16—22, etc., also includes a second pintel or trunnion 23 (Figs. 3 and 5) and each of these trunnions 23 includes an inner end portion 24 which projects into and is rigidly secured in an opening formed in the corresponding window frame 22. Each of the pintles or trunnions 23 also includes an outer end portion 25 which projects through and is rockably mounted in a movable weather-strip 26 (Figs. 4 and 5), which will be described presently, and each of the trunnions 23 also includes a collar portion 59.

The weather-strip 26 is slidably mounted in an opening 27 which is formed in a vertically extending wall 28 of the box-like housing 12 of the window frame 11.

Provided in the box-like side wall 12 of the window frame 11, between the inner and outer walls 28 and 29 thereof, is a vertically extending operating member or rod 30 which is slidably mounted in brackets 31 which are attached to the wall 28.

Provided on the lower end portion of the vertically extending operating member or rod 30 is a rack 35 and engaging with this rack 35 is a pinion 36. This pinion 36 is mounted on and carried by a horizontally extending and manually operable rod 37 which projects exteriorly of the window construction 10 through the bottom wall or sill 15 thereof and a handle 38 is provided on the rod 37 outwardly of the window and at the inner side thereof.

Carried by the vertically extending operating rod 30 is a series of vertically spaced projecting lugs 32 and each of these lugs 32 projects into and works in a cam slot 33 which is formed in a crank or arm 34 and these cranks or arms 34 are mounted on the outer end portions 25 of the trunnions 23 (Fig. 5).

Mounted in brackets 39 which are attached to the wall 28 is a group, consisting of at least two cam elements 40, for moving the weather-strip 26 into and out of effective or weather-stripping position. Each of these cam elements 40 has a centrally disposed offset portion 41 and these offset portions 41 engage with the weather-strip 26 on the outer side of the latter.

Each of the cam elements 40—41 has an arm 43 and the vertically extending operating rod 30 carries laterally extending lugs 44 each of which is engageable with one of the arms 43.

Attached to and carried by the weather-strip 26, on the outer side of the latter, are two brackets 53 each of which has an outwardly extending apertured portion 54 through which the offset central portion 41 of the corresponding cam element 40 extends.

Provided in the inner wall 20 of the box-like side wall or housing 13 of the window frame 10 is a vertically extending groove 46 (Fig. 4) in which the vertically extending marginal edge portions 55 of the window panes 16 are adapted to seat (Fig. 4) and provided in the weather-strip 26, on the inner side thereof, is a vertically extending groove 47 in which the vertically extending marginal edge portions 56 of the window panes 16 are adapted to seat.

Provided on the vertically extending operating member or rod 30 are two spaced cams or bosses 57 each of which is engageable with one of the arms 43, for reasons to be explained presently.

The operation of the form of the new window construction which is illustrated in Figs. 1 to 5, inclusive, is as follows: When the window is closed the vertically extending marginal edge portions 55 and 56 of the window panes 16 are disposed or seated in the vertically extending grooves 46 and 47 which are formed in the wall 20 and in the weather-strip 26, respectively (Fig. 4), and hence the new window is thus sealed or weather-stripped when in closed position.

Accordingly, in order to open the new window it is merely necessary to grasp the handle or knob 38 and turn or rotate the same and the shaft 37 (clockwise, Fig. 1). This movement of the handle 38 and its supporting shaft 37 acts, through the pinion 36 and the rack 35, to raise the vertically extending operating member or rod 30.

As the operating member or rod 30 is raised, the cams or bosses 57 carried thereby engage the arms 43 and rock the cam elements 40 in a direction to move their offset center portions 41 (left to right, Fig. 4) in the apertured portions 54 of the brackets 53, thus moving the weather-strip 26 (left to right, Fig. 4) and thereby moving the grooved portion 47 thereof out of engagement with the marginal edge portion 56 of the window panes 16.

As the weather-strip 26 is thus moved out of engagement with the marginal edge portions 56 of the window panes 16 the weather-strip 26 engages the collar portions 58 of the trunnions 23 as the weather-strip continues to move (left to right, Fig. 4) it thus moves or carries with it the window panes 16 and their frames 22 until the edge portions 55 of the window panes 16 are moved out of engagement with the groove 46 in the wall 20.

Thereupon, and as the operating member or rod 30 is thus raised, the lugs 32 carried thereby travel up the cam slots 33 in the cranks 34 and in so doing pivot the window panes 16 and their frames 22 into open position, as in Fig. 1.

However, when it is desired to close the win-

dow this may be accomplished by turning the handle 38 and its supporting shaft 37 in the opposite direction (counterclockwise, Fig. 1), this motion of the handle 38 and its supporting shaft 37 acting, through the pinion 36 and rack 35, to slide the vertically extending operating member or rod 30 downwardly.

As the operating rod 30 is thus lowered the lugs 42 carried thereby again travel down the cam slots 33 in the cranks 34 and in so doing swing the window panes 16 and their frames 22 back into closed position.

Likewise, as the operating member or rod 30 is thus lowered, and after the window panes 16 have been closed in the manner described above, the lugs or pins 44, which are carried by the rod 30, engage the offset or cam portions 41 of the cams 40 and in so doing rock the offset portions 41 thereof back into engagement with the weatherstrip 26. This slides the weather-strip 26 back into the closed or effective weather-stripping position in which it is shown in Fig. 4 and in which position the marginal edge portion 56 of the window panes 16 again rest in the groove 47 which is formed in the weather-strip 26.

As the weather-strip 26 is thus moved back into effective or weather-stripping position, it engages the window panes 16 and their frames 22 and in so doing slides the said window panes 16 on their pivots or trunnions 18 and 23 back into their normal and closed position, as in Fig. 4, and in which position the marginal edge portions 55 of the window panes 16 again enter the groove 16, thus completing the weather-stripping of the window.

A suitable stop or retaining member 58 (Fig. 5) may be mounted in the box-like side wall 12, and on the wall 28, in association with each of the pivots or trunnions 23, and so as to retain the said pivots or trunnions against outward displacement from their position of use (left to right, Fig. 5).

A slightly modified form of the invention is illustrated in Fig. 6, and in this form of construction parts which correspond to similar parts in the form of construction which is illustrated in Figs. 1 to 5, inclusive, are given the same reference numerals followed by the letter "a".

The modified form of construction which is illustrated in Fig. 6 is substantially similar to the form of construction which is illustrated in Figs. 1 to 5, inclusive, except for the construction of the weather-strip 49 and the trunnions or pivots upon which the window panes are mounted, and the retaining device or stop associated therewith.

Thus it will be noted that the weather-strip 49 differs from the weather-strip 26 in that it is provided on its inner surface with recesses 50 each of which is adapted to receive a shoulder 51 which is formed upon each of the trunnions 52 and acts as a stop to prevent the trunnions 52 from moving outwardly (left to right, Fig. 6) in the box-like side wall 12a of the window frame.

While I have illustrated and described preferred forms of construction for carrying my invention into effect, these are capable of variation and modification, without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

I claim:

1. A window construction comprising the combination of, a window frame including a vertically extending side wall member, a plurality of window panes swingingly mounted in said window frame for movement about horizontally extending axes into and out of open and closed positions, said side wall member having a vertically extending opening or slot formed therein, a vertically extending weather-strip slidably mounted in said opening or slot for movement transversely of said window frame into and out of weather-stripping engagement with vertically extending marginal edge portions of said window panes, means including a vertically extending operating member for moving the said window panes simultaneously into and out of open and closed positions, and means coacting with the said operating member for moving the said weather-strip into and out of weather-stripping engagement with the said marginal edge portions of said window panes.

2. The window construction defined in claim 1 which includes a side wall having a vertically extending weather-stripping groove formed therein on its inner surface and in which the window panes are fixed to but are slidable horizontally upon their supporting trunnions or pivots by the said weather-strip so as to dispose the said vertically extending marginal edge portions thereof in said weather-stripping groove.

3. The window construction defined in claim 1 and in which the initial movement of said operating member, coacting with associated parts, serves to move the weather-strip out of weather-stripping engagement with the vertically extending marginal edge portions of the window panes so as to free the latter for swinging movement into open position and in which further movement of said operating member, coacting with associated parts, during the window-opening operation, serves to swing the window panes into open position.

4. The window construction defined in claim 1 and in which the initial movement of said operating member, coacting with associated parts, serves to move the weather-strip out of weather-stripping engagement with the vertically extending marginal edge portions of the window panes so as to free the latter for swinging movement into open position and in which further movement of said operating member, coacting with associated parts, during the window-opening operation, serves to swing the window panes into open position, and in which the initial movement of said operating member, coacting with associated parts during the window-closing operation, serves to swing the window panes into closed position and in which further movement of said operating member, coacting with associated parts during the window-closing operation, serves to move the weather-strip back into weather-stripping engagement with the vertically extending marginal edge portions of the window panes.

5. The window construction defined in claim 1 which includes a side wall having a vertically extending weather-stripping groove formed therein on its inner surface and in which the window panes are fixed to but are slidable horizontally upon their supporting trunnions or pivots by the said weather-strip so as to dispose the said vertically extending marginal edge portions thereof in said weather-stripping groove, and in which the initial movement of said oper-

ating member, coacting with associated parts, serves to move the weather-strip out of weather-stripping engagement with the said vertically extending marginal edge portions of the window panes so as to free the latter for swinging movement into open position and in which further movement of said operating member, coacting with associated parts, during the window-opening operation, serves to swing the window panes into open position, and in which the initial movement of said operating member, coacting with associated parts, during the window-closing operation, serves to swing the window panes into closed position and in which further movement of said operating member, coacting with associated parts, during the window-closing operation, serves to move the weather-strip back into weather-stripping engagement with the said vertically extending marginal edge portions of the window panes.

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