May 17, 1932. M. J. TRACY 1,858,289

WINDOW

Filed Feb. 6, 1931 2 Sheets-Sheet 1

Fig. 1.

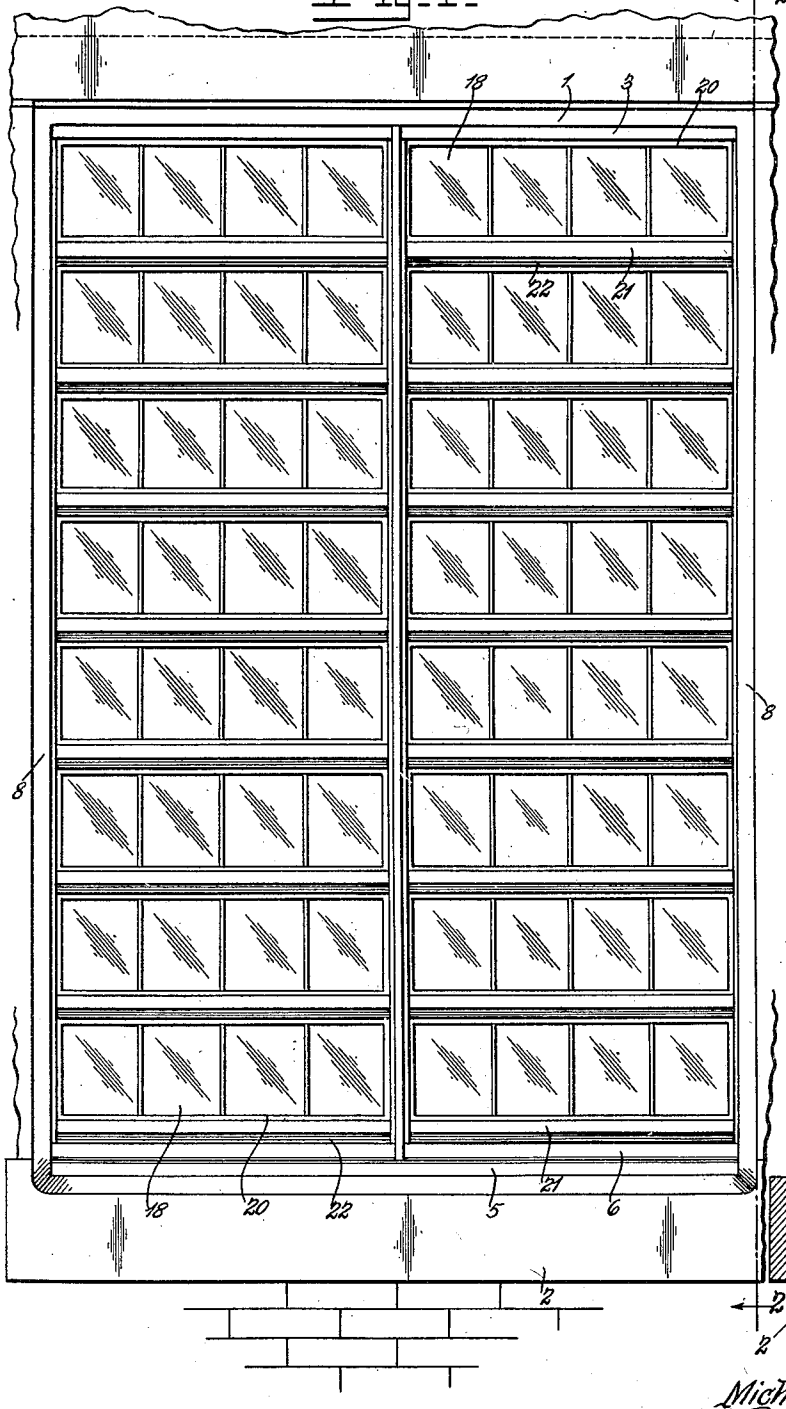
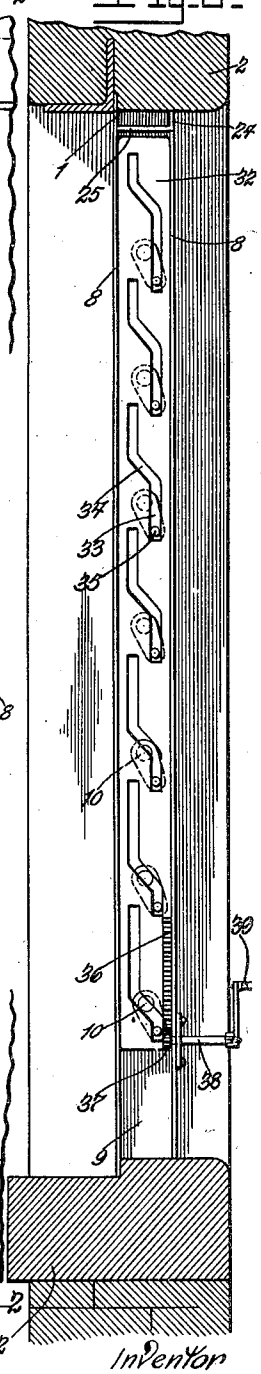


Fig. 2.



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Filed Feb. 6, 1931 2 Sheets-Sheet 2

Fig. 3.

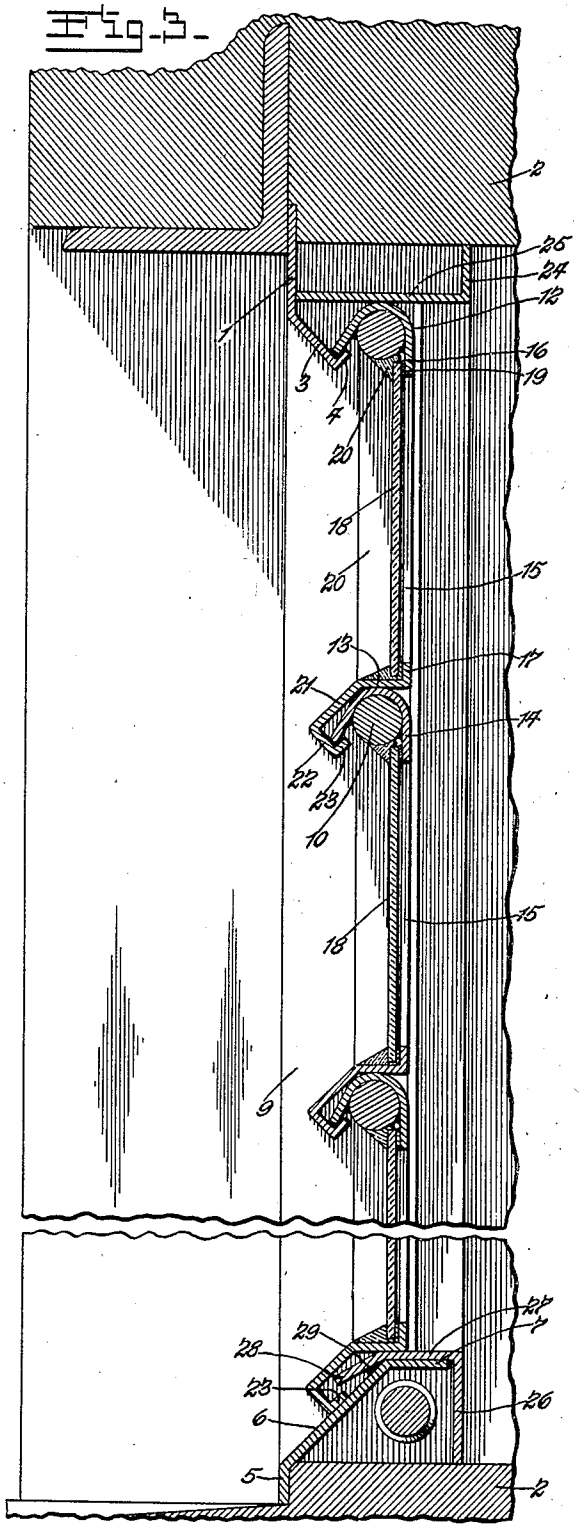


Fig. 4.

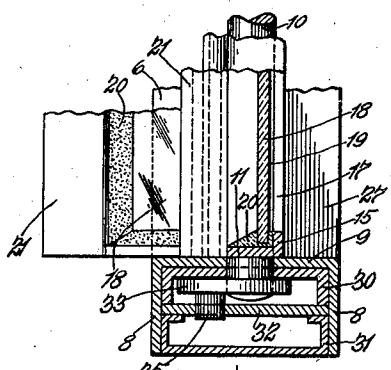
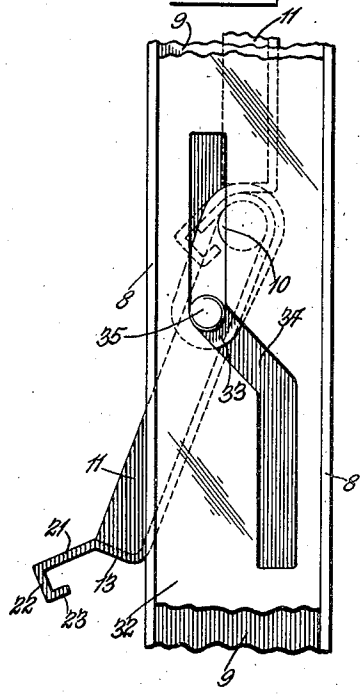


Fig. 5.



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UNITED STATES PATENT OFFICE

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WINDOW

Application filed February 6, 1931. Serial No. 513,834.

This invention relates to windows. An object of the invention is to provide an improved window comprising a vertical series of pivoted frames having their horizontal edges overlapping in order to close the window opening, in combination with improved mechanism for operating said frames to inclined positions to provide a louver arrangement in which the horizontal edges of the frames are spaced apart to provide ventilating openings.

Another object of the invention is to provide an improved window comprising a series of panels mounted in pivotally supported frames combined with improved interlocking means to prevent the occupant of the room equipped with the window from forcibly displacing any of the frames. By these interlocking devices, it is made impossible for any frame to be opened without operating the actuating and control mechanism for all of the frames.

Another object of the invention is to provide an improved window comprising a series of pivotally supported frames in combination with an actuator for operating said frames on their pivots from closed position toward open position successively, so that the lower frames of the series are first opened and the next upper frames in the series are successively opened by additional or further movement of the actuating and control mechanism.

Another object of the invention is to provide a window comprising a series of pivoted window sections, in combination with a combined actuator and control device for operating said sections to close the window, or to provide ventilating openings, and constructed so that said actuator and control device will limit extent of movement of the window sections toward open position, and thus prevent the creation of openings that are too large for the intended purposes.

Various other objects and advantages of the invention will appear from the following description, reference being made to the accompanying drawings, in which—

Fig. 1 is an outer side elevation of my improved window.

Fig. 2 is a vertical sectional view approximately on the line 2—2 of Fig. 1 showing the mechanism for opening and closing the window.

Fig. 3 is an enlarged vertical sectional view showing the interlocking devices between the respective window panel frames.

Fig. 4 is an enlarged horizontal sectional view showing the window frame operating device.

Fig. 5 is a side elevation of the window frame operating device.

The frame proper of my improved window is constructed and designed to support a series of pivoted frames having interlocking connections for holding them in closed position and having connections with operating mechanism whereby they may be moved to inclined or open position for ventilating purposes.

The window frame proper comprises an outer portion including upper, lower and side members. The upper member of the frame proper has a part 1 having rigid connection with the wall 2 of the building. The lower marginal portion 3 of the part 1 inclines downwardly and inwardly and has its inner edge inclined upwardly and inwardly to provide a flange 4. The lower member of the frame proper comprises a part 5 having rigid relationship with the wall 2 and having an upper portion 6 inclining upwardly and inwardly and provided along its upper edge with a horizontal inwardly extended flange 7. The side members of the window frame proper are of channel formation including flanges 8 extending laterally from the intermediate portion 9 of which they are integral parts. The channel portions 8 extend toward the vertical sides of the window opening in which the frame is mounted, thus spacing the frame portions 9 from the vertical side walls of the opening.

A vertical series of horizontal rods 10 have their ends pivoted in the window frame members 9, and each of these rods 10 constitutes a support for a swinging frame that supports the transparent or translucent panes. Like the frame proper above described, each of the swinging frames is composed of metal

and includes vertical side members 11 mounted adjacent to the inner surfaces of the frames 9 and having their upper ends integral or rigid with a horizontal frame member 12 and their lower ends rigid with a lower horizontal frame member 13. The upper frame member 12 of each swinging frame is curved in cross-section and seated upon the corresponding rocking rod 10 and is rigidly secured thereto by welded or soldered connection 14, or otherwise, so that, when the rods 10 are rocked, the several frames for the individual window panes will be swung outwardly to open positions or inwardly to closed positions, depending upon the direction in which the rods 10 are rocked. The side members 11 of the pivoted frames have inwardly extended flanges 15 along their inner edges, the upper frame member 12 has a downwardly depending flange 16 along its inner edge in alinement with the flanges 15, and the lower frame member 13 has an upwardly extended flange 17 along its inner edge in alinement with the flanges 15. In each of these swinging frames constructed as described, a transparent or translucent pane 18 is mounted, an impervious joint being obtained between the edges of said pane 18 and the flanges 15, 16 and 17 by putty 19 or other appropriate substance. The upper, lower and side edges of each pane 18 are sealed along their outer sides by putty 20 or other appropriate substance applied thereto and arranged in a familiar manner and as clearly shown. Thus, each pane 18 is mounted in its swinging frame and hermetic joints are obtained.

The outer edge of each lower frame member 13 is formed with a downwardly and outwardly inclined portion 21, the lower edge of which is bent to form a downwardly and inwardly inclined portion 22 having its edge bent to provide an upwardly and inwardly extended flange 23. When these frames are in closed position, the flanges 23 extend upwardly along the inner sides of the outer edges of the upper frame members 12 (Fig. 3), cooperating therewith to provide an interlock that positively prevents outward swinging movement of any frame without swinging all of the frames outwardly at the same time. The downwardly and outwardly extended portion of the frame member 12 at the top of the series extends above the rigid frame portion 3 and cooperates with the edge flange 4 to provide a sealed joint. The flange 23 on the lower frame of the series is designed and adapted to seat against the rigid frame portion 6 and cooperate therewith to form a sealed joint.

The rigid frame proper further comprises an angular upper member including a vertical flange 24 abutting against the wall 2, and a horizontal flange 25 extending outwardly across the upper side of the pivoted frame member 12 and into contact with the upper rigid frame member 1. The flange 24 is in alinement with the inner flanges 8 of the rigid side frame members. An angular rigid lower frame member is also provided, the same comprising a vertical flange 26 having its edge seated upon the bottom wall of the window opening, and an outwardly extended flange 27 overlying the flange 7, and a downwardly and outwardly inclined marginal portion 28 connected with the frame portion 6 by solder 29 or other sealing substance.

One of the vertical side frame members of each window encloses guides 30 and 31 between which a plate 32 is mounted for vertical sliding movements (Fig. 4). Each of the rods 10 has attached to one end thereof a lever 33 located between the guide 30 and the sliding plate 32. The sliding plate 32 has a series of cam slots 34 therein, one of said slots being opposite each of the pivoted frames of the window. Pins 35 rigid with the respective levers 33 project into the cam slots 34 so that vertical sliding movements of the plate 32 will successively rock all of the rods 10 and thereby successively swing all of the swinging frames to open positions or to closed positions, depending upon the direction in which the rods 10 are turned.

As shown in Fig. 2 of the drawings, the cam slots 34 are arranged in such a relationship to each other and to the crank pins 35 that, during initial downward movement of the actuator plate 32, the lowermost window frame is moved outwardly; and thereafter, during successive downward stages of movement of the plate 32, the remaining window frames of the series are successively swung outwardly. In this way, the lowermost window frame of the series is moved outwardly to its full extent, which is an outwardly and downwardly inclined position, while the remaining frames of the series extend outwardly in graduation upwardly. Thus, when the lowermost frame of the series is inclined outwardly to its full extent, the uppermost frame of the series has not yet been started or moved from its closed position, the remaining frames of the series being in graduated arrangement as to their open positions. This provides an efficient guard so that ventilation may be obtained during rainy or other falling weather without danger of the rain, etc. passing through the window openings into the room.

The plate 32 has a rack 36 rigidly attached thereto (Fig. 2) and engaged by a pinion 37 attached to the end of a shaft 38 equipped with a crank 39 whereby said shaft may be rotated in order to cause the gearing 36—37 to move the sliding plate 32 upwardly or downwardly, and thereby open or close the window as desired. Obviously, the arrangement of the cam slots 34 limit extent of outward swinging movements of the respective

swinging frames, thus making it impossible for the occupant of the room equipped with the window to move any of said swinging frames outwardly beyond their intended positions. Since the plate 32 is concealed and inaccessible, it is impossible to tamper with said plate or to disarrange the connections between said plate and the respective window frames controlled thereby, although the plate may be moved longitudinally as required to open the window frames to the desired extent. Accordingly, the plate 32 constitutes an actuator for opening and closing the swinging frames, and also constitutes a control to limit extent of the window frames toward open positions.

It is now clear that my invention obtains all of its intended objects and purposes efficiently and satisfactorily, and is capable of considerable variation without departure from the nature and principle of the invention.

I do not restrict myself in any unessential respects, but what I claim and desire to secure by Letters Patent is:—

1. A window of the character described comprising a vertical series of window sections, rockable rods attached to and supporting the upper edges of said sections respectively, mechanism for swinging said sections successively outwardly to outwardly and downwardly inclined positions by continued operation of said mechanism in one direction, and interlocking means preventing swinging of said sections other than by operation of said mechanism.

2. A window of the character described comprising a vertical series of window sections, rockable rods attached to and pivotally supporting the upper edges of said sections respectively, mechanism for swinging said sections successively outwardly to outwardly and downwardly inclined positions by continued operation of said mechanism in one direction, and interlocking extensions in connection with the upper and lower edges of said sections respectively concealing said rods from view and preventing outward swinging movement of an upper section until the next adjacent lower section that is interlocked therewith has been swung outwardly to an outwardly and downwardly inclined position.

3. A window of the character described comprising a vertical series of window sections, devices supporting the upper edges of said sections respectively, mechanism for swinging said sections successively outwardly to outwardly and downwardly inclined positions by continued operation of said mechanism in one direction, and interlocking means at the upper and lower edges of the respective sections preventing swinging of said sections other than by operation of said mechanism and other than successively as aforesaid.

4. A window of the character described comprising a vertical series of window sections, devices pivotally supporting the upper edges of said sections respectively, mechanism for swinging said sections successively outwardly to outwardly and downwardly inclined positions by continued operation of said mechanism in one direction, and interlocking extensions in connection with the upper and lower edges of said sections respectively concealing the upper edges of the said respective sections from the outside and preventing outward swinging movement of an upper section until the next section that is interlocked therewith has been swung outwardly as aforesaid.

5. A window of the character described comprising a vertical series of window sections, devices pivotally supporting the upper edges of said sections respectively, mechanism for swinging said sections successively outwardly to outwardly and downwardly inclined positions in a louver arrangement by continued operation of said mechanism in one direction, and means in connection with the lower edge of each section interlocking with and covering the outer side of the upper portion of the next adjacent lower section and preventing outward swinging movement of said upper section until the next adjacent lower section has been swung outwardly.

6. A window of the character described comprising a vertical series of pivotally supported window sections, interlocking devices at the upper and lower edges of said sections respectively covering the outer side of the upper portion of each section and preventing opening of said sections other than in a predetermined order, operating mechanism for said window sections movable from and to a starting position, and means operated by said operating mechanism for swinging said sections successively outwardly to outwardly inclined positions by continued movement of said operating mechanism in one direction from said starting position and for moving said sections to closed positions successively in reverse order from the order in which they were moved outwardly as aforesaid and by continued operation of said mechanism toward the starting position thereof.

7. A window of the character described comprising a vertical series of window sections, a vertical series of horizontal rods attached to the upper edges of said sections respectively, means for supporting said rods for rocking movements, interlocking devices for interlocking the lower edge of each section with the lower edge of the next adjacent lower section and preventing outward swinging movement of each section until the next adjacent lower section has been swung outwardly, and mechanism for swinging said sections successively outwardly to outwardly and downwardly inclined positions.

8. A window of the character described comprising a vertical series of window sections, a vertical series of horizontal rods attached to the upper edges of said sections respectively, means for supporting said rods for rocking movements, interlocking devices for interlocking the lower edge of each section with the lower edge of the next adjacent lower section and preventing outward swinging movement of each section until the next adjacent lower section has been swung outwardly, and mechanism for swinging said sections successively outwardly to outwardly and downwardly inclined positions by continued movement of said mechanism from a starting position and for moving said sections to closed positions successively and in reverse order to their movement to their outward positions by continued movement of said mechanism to its starting position.

9. A window of the character described comprising a vertical series of window sections, rockable rods attached to and supporting the upper edges of said sections respectively, a downward extension in connection with the upper edge of each of said sections at the outer sides of said rods, and a downward extension in connection with the lower edge of each of said sections interlocking with said first named extensions and cooperating therewith to conceal said rods from view and to prevent operation of the upper sections until the lower sections have been operated.

10. A window of the character described comprising a vertical series of window sections, rockable rods attached to and supporting the upper edges of said sections respectively, a downward extension in connection with the upper edge of each of said sections at the outer sides of said rods, a downward extension in connection with the lower edge of each of said sections interlocking with said first named extensions and cooperating therewith to conceal said rods from view and to prevent operation of the upper sections until the lower sections have been operated, an actuator for said rods, and mechanism for moving said actuator from a starting position to operate said rods to open said sections successively and for closing said sections successively in reverse order to the order in which they were opened.

MICHAEL J. TRACY.