No. 847,477. PATENTED MAR. 19, 1907.

O. H. IMAN.

AUTOMATIC WINDOW.

APPLICATION FILED DEC. 11, 1906.

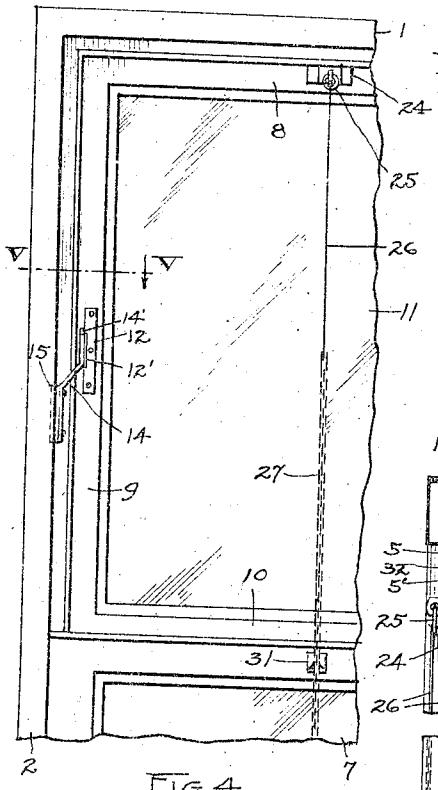

FIG. 1.

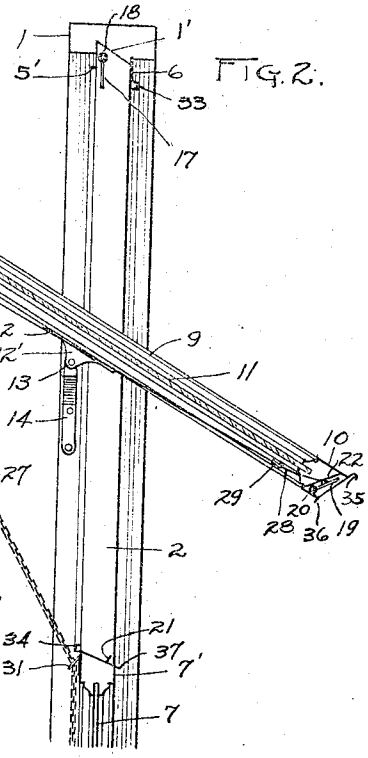

FIG. 2.

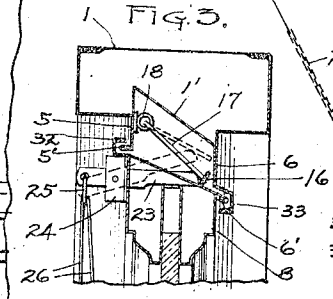

FIG. 3.

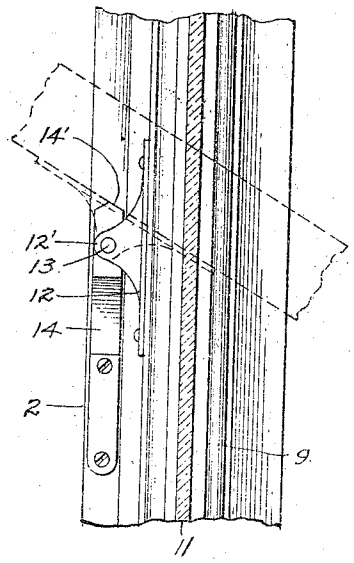

FIG. 4.

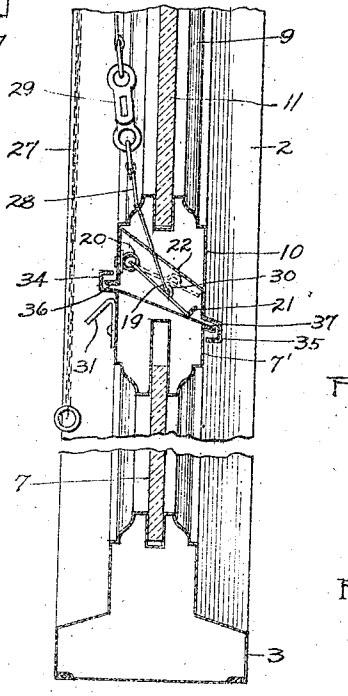

FIG. 5.

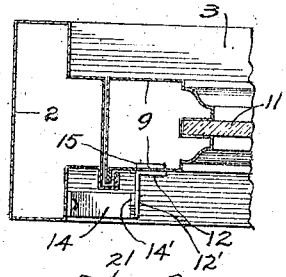

FIG. 6.

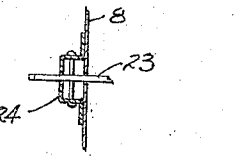

FIG. 7.

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AUTOMATIC WINDOW.

No. 847,477. Specification of Letters Patent. Patented March 19, 1907.

Application filed December 11, 1906. Serial No. 347,246.

To all whom it may concern:

Be it known that I, ORLA H. IMAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Windows, of which the following is a specification.

This invention relates to improvements in fireproof windows of that type which is arranged to close and be locked automatically in the presence of fire; and the invention is concerned more particularly with certain improved sash-locking devices which are admirably adapted for the automatic fireproof windows.

It has been observed that when a fireproof window is subjected to intense heat, as in a fire, the distortion and warping are so great that ordinary catches or the like cannot safely be relied upon to hold the window closed. Moreover, such windows are in case of fire subjected to the action of streams of water from hose, and where the locking mechanism is exposed it is liable to be released by the impact of the water.

The salient objects of my invention are to provide an automatic sash-locking mechanism which is very strong and which cannot be rendered inoperative nor thrown out by distortion of the sash or sash-frame and which will to a great degree prevent such distortion; to provide an automatic sash-locking device which is concealed and protected, yet readily accessible for inspection or repair, and to provide an automatic sash-locking mechanism which will act upon the full length of both the top and bottom rail of the sash, so as to form a continuous union between the sash ends and its frame when locked.

Further and secondary objects are to provide simple yet reliable weatherproof joints between the sash-rails and the window-frame and to provide means for carrying off the water which in cold weather condenses upon the inside of the glass and preventing accumulation of the same in the hollow lower sash-rail or elsewhere.

To the above ends my invention consists in the matters hereinafter described, and more particularly pointed out in the appended claims.

The invention in a preferred form will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a broken-away inside elevation of an automatic fireproof sash provided with my improvements, the sash being closed. Fig. 2 is a vertical section of the same, showing the sash in open position. Fig. 3 is an enlarged broken-out vertical section of the sash in closed position and locked. Fig. 4 is a detail view of one of the sash-pivots, showing the open position of the sash in dotted lines. Fig. 5 is an enlarged cross-section taken on line V V of Fig. 1. Fig. 6 is a detail view showing several of the drip-water outlets at the bottom of the sash, and Fig. 7 is a detail view of the unlocking-lever and its bracket.

The window-frame, comprising the lintel 1, the uprights 2, and the sill 3, is made, as usual in fireproof windows, of sheet metal formed up to provide a hollow casing whereof the several side and end members are riveted or otherwise suitably united to prevent separation of said parts by intense heat.

The sectional form of the sill 3 and of the lintel 1 are clearly shown in Fig. 3 of the drawing. The lintel is, roughly speaking, rectangular in section; but its lower wall is formed with an inclined portion 1′, the upper edge of which is recessed into the lintel and the lower edge of which projects a little below the same. Adjacent the inner and upper edge of said inclined portion is a depending lip 5, formed with a flange 5′. Adjacent the outer face of the lintel, but set back to or flush with the outer plane of the sash, is a similar depending lip 6, which forms the outer wall of a recess by which a part of the locking device is inclosed. The lip 6 is provided with a weather-flange 6′, which is outwardly and then inwardly turned.

7 indicates the lower sash, which is usually made immovable and is so shown.

The upper and automatic sash 11 comprises the upper rail 8, the stiles 9, and the lower rail 10 and is fitted with the usual fireproof glass 11, as is the lower sash 7. The sash 11 is of hollow sheet-metal construction, and the glass is attached or mounted in any well-known manner. The window is swingably mounted by means of brackets 12, secured to the stiles 9, and attached by pivot-

bolts 13 to stationary brackets 14, which are screwed to the inner faces of the frame sides 2. Reinforcing-plates 15 should be provided for brackets 14 and 12. The brackets 12 are formed with inwardly-projecting ears 12′, whereby the pivots 13 are so positioned that the sash will be self-closing by gravity. Preferably said brackets are placed midway between the ends of the sash. It will be observed in Figs. 2 and 4 that the upper end of each fixed bracket 14 is formed with an inclined face 14′, set at a proper angle and forming a positive stop for limiting the opening of the sash. By this neat and effective device I dispense with limit-chains or the like.

Both the upper and the lower rail of the sash 11 are provided with my improved locking devces, which are pactically identical in construction. The upper one thereof is housed by the lintel, while the lower one is carried by the bottom sash-rail 10. The lock for the upper end of the sash is constructed as follows: The top of the upper sash-rail 8 is provided with a strong longitudinal upwardly-projecting flange 16, which extends the full width of the sash, or nearly so, and may be termed a "stop or locking flange." Pivoted within the recess of the lintel is a transverse locking-bar 17, coextensive in length with said flange 16 and arranged to fall by gravity behind the latter when the sash is closed, thereby locking the sash in closed position, as shown in Fig. 3. The pivoting of the locking-bar is preferably upon a row of eyebolts 18 or their equivalent, the eyes of which loosely engage round holes through the upper edge of said bar, thereby supporting the latter. The eyebolts 18 are secured to the inner lip 5 of the lintel 1. When the sash is being closed and nears that position, its locking-flange 16 lifts and passes beneath the locking-bar 17, which then drops as aforesaid. The locking device for the lower end of the sash is very similar and comprises a locking-bar 19, pivoted on eyebolts 20, and an upwardly-projecting flange 21, adapted to be engaged by said bar 19. Flange 21 is formed on or held by the meeting-rail 7′ of the lower sash 7. Said bar and flange both extend the length of the sash-rail. In this case the eyebolts 20 are secured to the inner face of the upper meeting-rail 10. The bottom 22 of the rail 10 is inclined, as shown, and forms a stop for said locking-bar when the latter is raised to permit opening of the sash 11.

Any suitable means for unlocking the window may be employed, that shown in the drawing being deemed the most suitable for coöperation with my locking devices. For lifting the top locking-bar 17 I provide a lever 23, pivoted on a bracket 24, secured to the inner side of the top sash-rail. Said lever passes through a slot in the sash-rail and terminates underneath the lower edge of the locking-bar 17, as shown in full lines in Fig. 3. The lever-bracket 24 is constructed to form a stop as well as a pivot for said lever. Attached to the external end of said lever is a smooth metal ring or pulley 25, through which passes a cord or wire 26, the respective ends of which are attached to an operating-chain 27 and a metal strip or wire 28, the latter through the intermediacy of a fusible link 29. The member 28 passes through openings cut in the lower sash-rail 10 and is attached to an eye 30 on the lower locking-bar 19.

For engaging the operating-chain 27 a catch or hook 31 is provided upon the rail 7′ of the lower sash. The sash may be held open at any desired angle within its limits by engaging the chain 27 with the catch device 31. In case of fire or a degree of heat sufficient to separate the fuse-link 29 the sash will obviously swing shut by gravity and will be solidly locked by the two gravity-bars 17 and 19. In the closing movement of the sash its locking-flange will slidingly lift the upper locking-bar, while its lower locking-bar will pass over the lower locking-flange 21. As they drop the locking-bars are sufficiently heavy to return the lever 23 and to draw the cord 26 a short distance through the ring 25 on said lever.

The sash may be opened by pulling down on the chain 27, which movement will trip the lever 23, lift locking-bar 17, and also draw up wire 28 and locking-bar 19. The sash is now freed, and further actuation of chain 27 will pull the top of the sash inwardly. The chain may then be fastened, as aforesaid.

The upper sash-rail 8 is provided with a groove-shaped inner flange 32, which takes over the lintel-flange 5′, and with an outer flange 33, which takes into the grooved weather-flange 6′. Similarly the lower sash-rail 10 is provided with flanges 34 and 35, which respectively take over the plain flange 36 and into the grooved flange 37 on the rail 7′ of the lower sash. All of said flanges form the sash-stops in one direction, while the locking-bars, together with the strong rigid flanges 16 and 21, form equally positive stops in the other direction.

It is to be particularly noted that the sash-locking devices act upon the full breadth of the sash at both top and bottom. This construction will prevent distortion of the sash in the presence of fire and water. The construction has the further advantage of being self-contained when the sash is in its normal—*i. e.*, closed—position. It is thus well protected from the elements and presents no unsightly parts. The certainty of operation will be evident when the simplicity of the mechanism is considered.

In cold weather if the air inside the build-

ing is heated, and especially when the window is closed, water will condense upon the inner face of the pane 11 and will run down over the lower sash-rail, the flange 34, and the top of the meeting-rail 7'. To prevent the accumulation of such water within the trough formed by the flange 21, I cut through said flange a series of openings 38, as shown in Fig. 6. The water will run through these openings and will drip from flange 36 to flange 35, from which it will either evaporate or will fall to the ground.

Modifications will suggest themselves to one skilled in the art, and I wish it understood that I do not limit my invention to the specific constructions herein shown and described.

I claim as my invention—

1. In combination, a window-frame, a sash pivoted therein, a pivoted gravity locking-bar held by the lintel of said frame, a cooperating locking projection extending longitudinally of the top rail of the sash, and means for lifting said bar to unlock the sash, said bar being arranged to drop behind said locking projection to hold the sash in closed position.

2. In combination, a window-frame, a sash pivoted therein, the under side of the lintel of the frame being provided with a recess, a longitudinally-disposed locking-bar pivoted in said recess, a locking projection carried by the top rail of the sash, an unlocking-lever mounted on the sash and an operating-cable connected thereto and adapted to operate the lever when pulled in a direction tending to open the sash.

3. In combination, a window-frame, a sash pivoted therein, the under side of the lintel and the under side of the lower sash-rail being each recessed, a gravity locking-bar pivoted within the lintel-recess, a second gravity locking-bar pivoted within the recess of the lower sash-rail, coöperating locking projections upon the top sash-rail and the lower frame member against which the lower rail of the sash closes, and means for lifting both of said bars to release the sash.

4. In combination, a window-frame, a sash pivoted therein upon an axis located outside the plane of the sash, whereby the latter tends to close automatically by gravity, a gravity-actuated locking-bar carried by the lintel, and in the closed position of the sash operating to lock the latter throughout its principal width, a second gravity locking-bar carried by the lower side of said sash, and in the closed position of the sash operating to lock said sash throughout its principal width, interconnected mechanism for holding both of said locking-bars retracted, and a fusible link associated with said holding mechanism.

5. In combination, a sheet-metal upper window-frame member provided with a recessed inclined lower face, and depending lips forming a recess beneath said face, a gravity locking-bar pivoted within said recess, a swinging sheet-metal sash having its top rail provided with a locking-flange, said flange and locking-bar extending the width of the sash, said lips and sash-rail being provided with stop-flanges, and a lever for disengaging said locking-bar from said locking-flange.

6. In combination, an upper sheet-metal swinging sash and a sheet-metal lower sash, the meeting-rail of the upper sash being provided with a longitudinal recess, a gravity locking-bar pivoted within said recess, the meeting-rail of the lower sash having a locking-flange, said flange and said locking-bar extending the width of the sashes, said meeting-rails being provided with stop-flanges, and means for disengaging said locking-bar from said locking-flange.

7. In combination, a sheet-metal swinging sash, and a fixed sash therebelow, a sheet-metal window-frame, said frame and swinging sash having stop-flanges to limit the closing movement of the latter, the top member of said frame and the meeting-rail of the swinging sash being each provided with a longitudinal recess of length equal to the width of the sash, two gravity-actuated locking-bars pivotally mounted within said respective recesses, locking-flanges held respectively by the top of the swinging sash and the meeting-rail of the fixed sash; said locking-bars engaging said locking-flanges when the sash is closed in such manner as to lock the sash in closed position.

8. In combination, a swinging sash, an outwardly and downwardly inclined sheet-metal plate underlying the bottom of said sash when the sash is in closed position, said plate being provided with a longitudinal, upstanding locking-flange; the base of said flange being perforated for carrying off water of condensation which drips from the sash upon said inclined plate when the sash is in closed position.

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Witnesses:
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