T. LEE.
AUTOMATIC WINDOW CLOSURE.
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THOMAS LEE, OF HOME CITY, OHIO.

AUTOMATIC WINDOW-CLOSURE.


To all whom it may concern:

Be it known that I, THOMAS LEE, a citizen of the United States, and residing at Home City, Hamilton county, State of Ohio, have invented certain new and useful Improvements in Automatic Window-Closures; and I do declare the following to be a clear, full, and exact description of the invention, attention being called to the accompanying drawing, with the reference characters marked thereon, which forms also a part of this specification.

This invention relates to improvements to be used in connection with fire-proof and fire-resisting windows, and where they are provided with automatically operating devices which insure their closing in the event of an approaching fire.

A condition where my present improvements are applicable exists for instance in a heat-controlled window-closure as shown and described in a patent issued to me on October 16th, 1906, No. 833,229 where a flexible connection, or chain is used to hold a sash in a open position and passes through and occupies an opening which extends to the outside of the window where it is secured to a fusible connection so that in case a fire approaches from that side, destroying said connection, the chain is released and the sash permitted to close. The sash in closing usually carries the holding chain with it, or acts upon it in a manner which causes it to leave the opening which it occupied before. There are no means to close this opening and although the window may be closed, communication from one side of the same to the other, sufficient to permit fire to pass, is not completely cut off by reason of this opening.

The object of my present invention is to close at this time this opening, also the operation to be of course automatic the same as the closing of the window itself. I do this substantially by providing a flap or cut-off which closes automatically as soon as the window closes.

In the following specification and particularly pointed out in the claims at the end of which the invention, together with its operation, parts and construction, which latter is also illustrated in the accompanying drawing, in which:

Figure 1, in a vertical, central section of a window shows the application of my invention. Fig. 2, is an enlarged, vertical cross-section of the middle part, or transom-frame of this window, containing the parts involved in my invention and shows them as they appear while the window is held open. Fig. 3, in a similar view shows the same parts as they appear after the automatic devices have operated to permit the window to close. Fig. 4, is a horizontal section on line 4-4 of Fig. 2. Fig. 5, is an enlarged, vertical section on line 5-5 of Fig. 3.

In the drawing, 10, indicates a wall provided with window-openings which contain window frames 11, suitably constructed.

Sashes are fitted to these frames and supported in a manner to permit their opening. Their motion for opening may be a swinging or sliding one, and they are supported accordingly.

Sometimes where two sashes are provided in a frame, one only, usually the upper one, is supported for opening, while the other remains permanently closed. In the present case I have illustrated such a condition, 12 being the lower stationary sash and 13, the upper one which is movable to permit opening and closing. It is pivotally supported for such purpose at 14. Between these two sashes there is a cross or transom-frame 15, against which the upper sash with its lower edge seats when closing. In a one-sash window, the sill of the frame would be the equivalent of this transom-frame. The automatic closing of the movable sashes is by gravity provided for by balance weights. In a swinging sash, it may be obtained by particular location of the pivots. In all these cases a flexible connection, cable, but more usually a chain 16, is used to hold the movable sash in its open position. One end of this chain is permanently connected to the sash, while its other end, when the sash is to be held open, is temporarily attached to a suitable device, fitting, or hook 17, where it remains until manually released therefrom when the window is to be closed. In addition there are fusible links, connections or joints provided which are susceptible to heat, so as to melt in case of a fire, thereby releasing the chain which holds the sash automatically and permitting the latter to close. These fusible links or joints are provided in various posi-
tions, the general object being to locate them as near as possible in the path of flames or heat-currents which might be produced by a probable fire. In the present case this location is opposite to that side where chain 16, is provided. Since the release of this chain is to be controlled by the fusible link, it becomes necessary that both be operatively connected, and since they are located on opposite sides of the window, it is necessary that an opening or perforation be provided in some part of the window to render such operative connection possible. Accordingly in the case illustrated, an opening 18, is provided through the transom-frame which is occupied by an intermediate connecting member 19, whereby this operative junction is accomplished, and which member at one of its ends is permanently attached by means of a fusible joint A, in an exposed position and beyond the opening in the transom-frame. At its other end this intermediate connecting member carries hook 17, to which chain 16 is temporarily attached when the sash is to be held open.

It will now be seen that for all practical purposes, that is as far as effect of heat-controlled action upon the sash is concerned, member 19 which is in form of a short chain, hook 17 and chain 16 are equivalent to a continuous part which, as soon as released by disintegration of joint A, permit the sash to drop and close. As a matter of fact they might form one continuous chain were it not desirable also to control the opening and closing of the window manually which requirement makes it necessary to provide for the possibility of release without disturbing fusible joint A. This latter consists preferably of two complementary parts 21 and 22, which are soldered together with a suitable metal and of which part 21, is provided with an eye 23, which is slotted to permit attachment of chain 19, while part 22 is attached to a bracket 24, connected to the window-frame, and projecting therefrom so as to sufficiently expose the joint. The two contacting parts of this latter are also provided with registering slots 25, the object of these being to increase the access of heat to the soldered joint so as to retain action, that is disintegration, as quickly as possible. Eye 23 of part 21 has also an open notch 26 to permit connection to chain 19, when the parts are assembled.

Figs. 2 and 4, illustrate the described parts in their normal condition. Fig. 3, shows them after the fusible joint A, has been separated by heat, part 22 remaining usually in position, while part 21 and chain 19, have been released and pulled in through opening 18, by the weight of the dropping sash, acting on them by chain 16. To insure a smooth and quick movement for these parts while slipping through the opening in the window-frame, the same is surrounded by a tube 27, set into the frame and which is open at both ends and in the normal condition is occupied by chain 19. It will be noted that when this latter has left tube 27, after its release from joint A, and permitted the sash to close, communication from one side of the window to the other, sufficient to permit heat, fire or sparks to pass, is still open, through opening 18, notwithstanding the sash is now closed. To prevent such communication I provide a cut-off or flap B, supported in tube 27, and of an area sufficient to close the same. This cut-off is so arranged as not to interfere with the normal operation of the parts, and as shown in Figs. 1, 2, and 4, it is held up by the parts occupying opening 18. As soon as this opening is cleared, however, by chain 19 this cut-off is permitted to drop, thus closing this opening completely as shown in Fig. 3. This cut-off is supported in a slot 28, in the upper part of tube 27, and might be arranged to have a sliding movement when dropping down. By preference however, it is supported to have a swinging movement, it being provided with a curved edge 29, on which it hangs on the upper part of tube 27, the curb being outside to prevent the upper edge of the flap from dropping down. The lower edge has a curved lip 31, to prevent interference with the movement of chain 19, when, after its release, it slips through opening 18. A short piece of cable or wire may also be used in place of chain 19.

Having described my invention, I claim as new:

1. In a fire-retarding window-construction, the combination of a sash, a window-frame in which it is movably supported and which has a perforation, means provided both sides of the window attached also to the sash and passing through the perforation in the window-frame which means are heat-controlled and adapted to operate to close the sash automatically and a cut-off adapted to operate by these heat-controlled means for the purpose of closing the perforation in the window-frame.

2. In a fire-retarding window-construction, the combination of a sash, a window-frame in which it is movably supported, a tube set transversely into this frame and open at both ends, connecting means attached on one side of the frame by means of a fusible joint and extending through the tube mentioned to the other side where they are attached to the sash and a cut-off supported in the tube and held inoperative by the part occupying the tube and adapted to close the tube when this latter is cleared by the part therein.

3. In a fire-retarding window-construction, the combination of a sash, a frame in
which it is movably supported, a tube set transversely into this frame and open at both ends, a fusible joint provided near one of the open ends of this tube, a chain connecting this joint with the sash and also occupying the tube, and a flap supported on the upper side of the tube and adapted to close this latter when the chain therein after its release from the fusible joint has been pulled out of the tube by the dropping sash.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

THOMAS LEE.

Witnesses:
C. SPENGEL,
T. LE BEAU.