No. 686,869. Patented Nov. 19, 1901.

E. VAN NOORDEN & H. C. SMITH.

SELF CLOSING WINDOW.

(Application filed Oct. 20, 1899.)

(No Model.) 2 Sheets—Sheet 1.

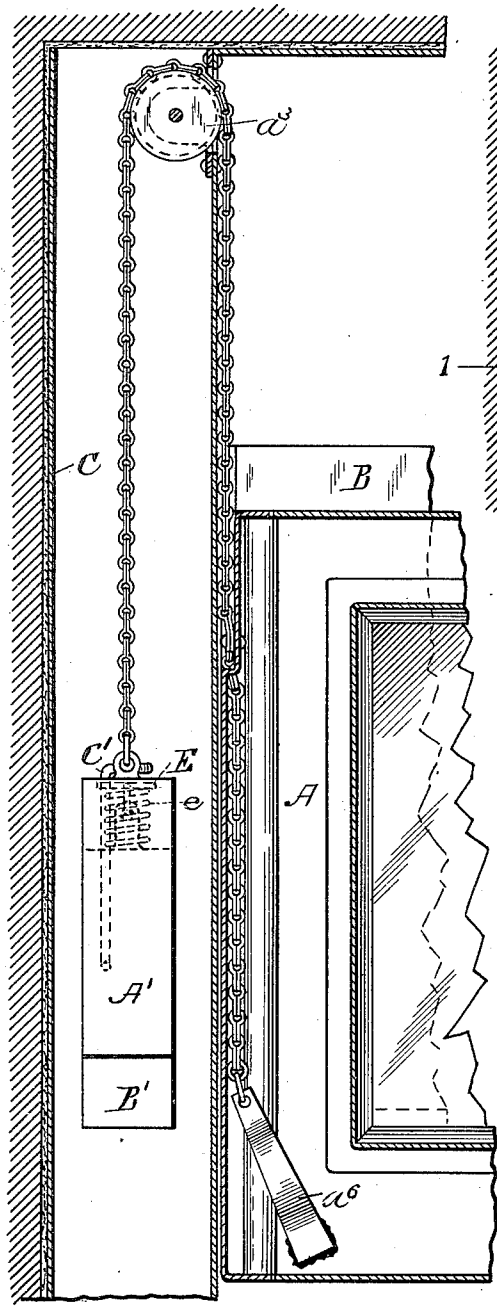


Fig. 1.

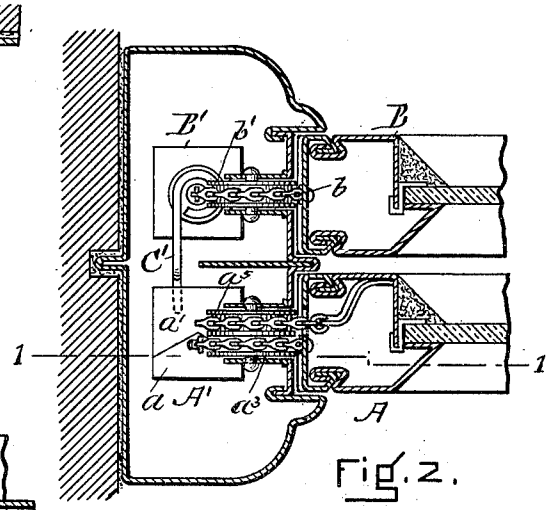


Fig. 2.

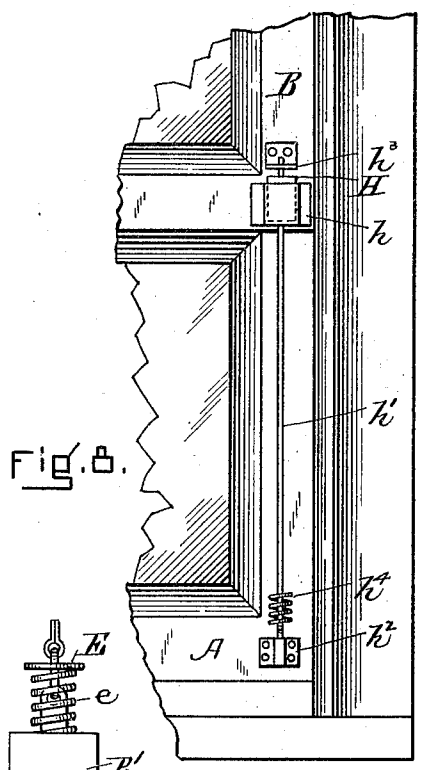


Fig. 8.

Fig. 3.

WITNESSES

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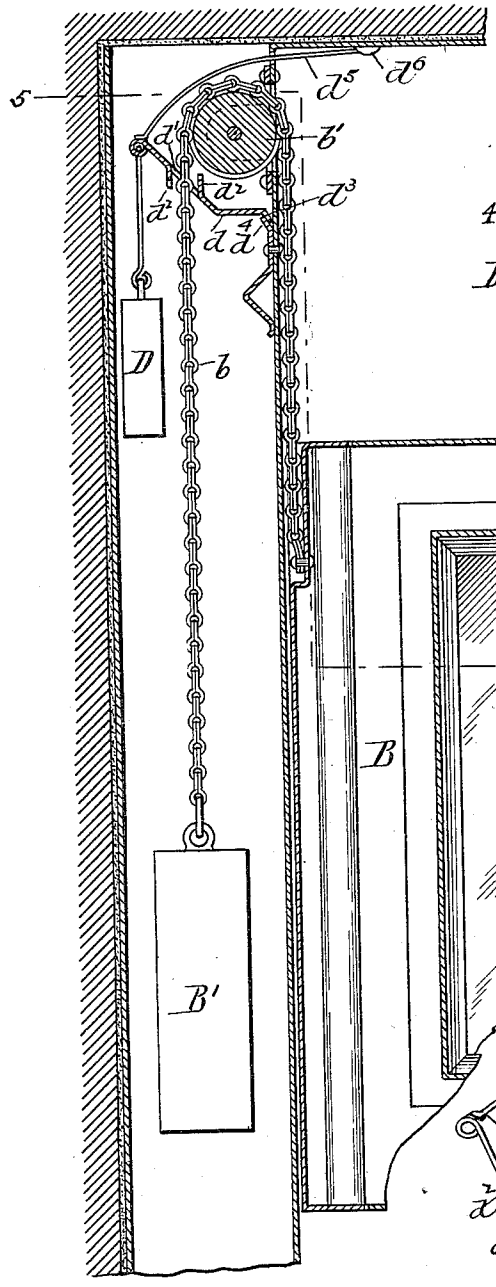


Fig. 4.

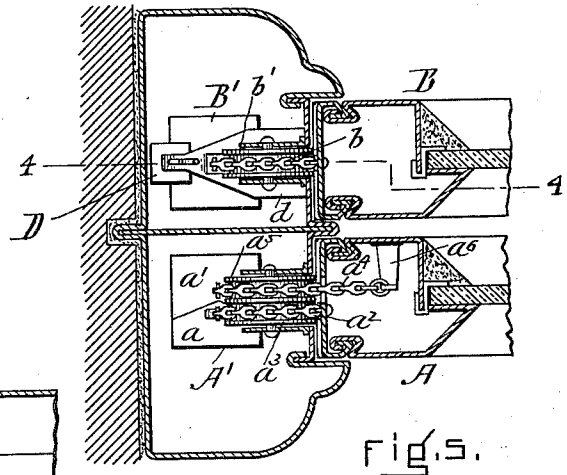


Fig. 5.

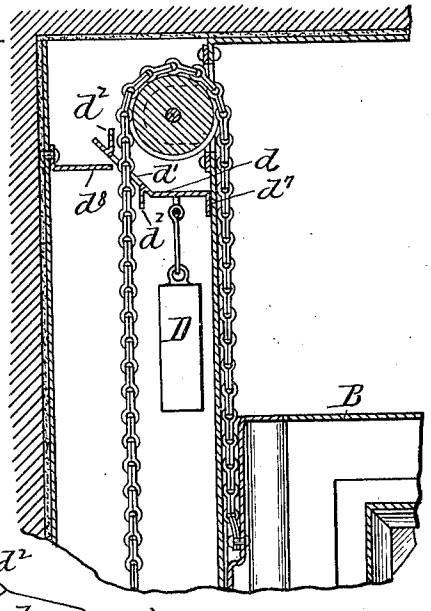


Fig. 6.

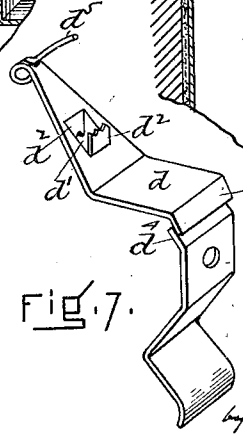


Fig. 7.

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UNITED STATES PATENT OFFICE.

EZEKIEL VAN NOORDEN AND HENRY C. SMITH, OF BOSTON, MASSACHUSETTS.

SELF-CLOSING WINDOW.

SPECIFICATION forming part of Letters Patent No. 686,869, dated November 19, 1901.

Application filed October 20, 1899. Serial No. 734,208. (No model.)

To all whom it may concern:

Be it known that we, EZEKIEL VAN NOORDEN and HENRY C. SMITH, citizens of the United States, and residents of Boston, in the county of Suffolk, in the State of Massachusetts, have invented a new and useful Improvement in Self-Closing Windows, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in explaining its nature.

The invention relates to windows having sashes movable vertically in a window-casing and hung and balanced by window-weights in the ordinary manner and which in the case of fire in the vicinity of the window will be automatically closed by either the automatic release of a portion of the balancing-weights in order that the lower sash may then overbalance the weights and close downward, as in the case of the lower sash, or to add to the balancing-weights, so that they may then act to overbalance the sash and move it upward, as would be required by an upper sash to close the window.

In the drawings, Figure 1 is a view principally in vertical section upon the dotted line 1 1 of Fig. 2, the upper sash being represented as pulled down or lowered. Fig. 2 is a view in horizontal section of one side of the window-casing with a portion of the window-frames and also in plan of the window-weights, sash-chains, and chain-pulleys. Fig. 3 is a detailed view representing a buffer attached to the weights of the upper sash, to which reference will hereinafter be made. Fig. 4 is a view in vertical section upon the dotted line 4 4 of Fig. 5. Fig. 5 is a horizontal section upon the dotted line 5 5 of Fig. 4. Fig. 6 is a view upon the line 4 4 of Fig. 5, illustrating a modification. Fig. 7 is a view in perspective of a weight-holding bracket detached from the casing. Fig. 8 is a view in elevation representing another modification in the manner of applying an operating-weight to the sash, to which reference will be made.

A represents the lower sash of the window, B the upper sash, and C the window-casing. They may be of wood or of metal. We have represented them as of metal. Each sash is adapted to be moved vertically by hand in the casing in the ordinary way of opening and closing windows, and each sash is hung by counterbalancing-weights and connecting-cords running from pulleys. The lower sash A has its counterbalancing-weights A′ formed in two sections—namely, the section a and the section a'. Each section is connected with the sash-frame by an independent cord, which may be of metal or fibrous material. The weights a are connected to the sash by the cords a^2, which run over the pulleys a^3. These cords or chains are permanently attached to the sash-frame and the weights. The weights a' are connected with the sash-frame by the cords or chains a^4, extending over pulleys a^5. These cords or chains are united to the sash-frame by connections a^6, preferably of metal, to which the ends of the cords or chains are attached and which are united to the sash-frame by solder fusible at a relatively low temperature caused by fire, and in case of fire near the window the weights a' will be released by the fusion of the solder, and thereby permit the sash, if it be raised, to automatically close, as it will then overbalance the weights a. In common use it will be understood that the weights a a' together balance the sash A.

The upper sash B is balanced by the weights B′, which are connected with the sash by the cords or chains b, passing over pulleys b'. As the upper sash is closed by lifting, it is necessary in order to automatically close it that the weights should overbalance the sash, and this result is obtained by means of the supplemental weights, which are released in case of fire and are then combined with the ordinary weights B′. These supplemental weights may be the weights a' of the lower sash, which may be so combined with the weights B′ or their cords b as to exert their weight upon the upper sash when they are released from the lower sash, and thus overbalance with the weights B′ the weight of the upper sash, or there may be held over the weights B′ supplemental weights which shall be released in the case of fire to combine their weights with those of the weights B′. We have shown both forms of construction in the drawings, the first form being represented in Figs. 1 and 2 and the second in Figs. 4 and 6.

Where the weights a' are used, they may be combined with the weights B' by an arm C', preferably rigid, extending from the weights a' and making connection with the weights B' by means of the weight-cords b or other suitable connection. It will be understood that when the lower sash is raised and the upper sash lowered the weights of the upper sash will be somewhat below the weights of the lower, as seen in Fig. 1, and that the connection between the weights a' and the weights B' must be such as to permit these and all other changes in position of the two sets of weights due to the movement of the sashes. In operation the weights a', being released from the sash A, combine with the weights B' to overbalance with them the weight of the upper sash and serve to assist in closing the same automatically.

In Figs. 4 and 6 the auxiliary weights are lettered D and are represented as suspended from brackets d above the weights B'. The brackets are held to the window-casing by fusible solder and have holes d', through which the cords b run. The brackets may also have cord attaching or gripping devices or points d^2, which upon the release of the brackets shall engage the cords, and thereby unite the auxiliary weights with them, or the brackets may fall upon the cords until they come in contact with the weights B', when the weights B will be then combined with them and to assist them in automatically closing the upper sash and holding it closed. One form of bracket d is represented in Figs. 4 and 7 and another in Fig. 6. The form in Fig. 4 has a foot d^3, which rests on the fixed ledge d^4 and which has extending from its outer end an arm d^5, which acts to suspend it and which is connected at d^6 by fusible solder with the casing outside the pocket. Upon the melting of the solder the bracket becomes unsupported at its outer end and detached from its inner end and engages the window cord or chain as the weight d drops by its points d^2. In Fig. 6 the bracket is represented as attached to the casing at d^7 by a fusible solder and is supported at the outer end by the fixed support d^8. Upon the melting of the fusible solder the bracket is released from the casing and from its support and, the weight falling, the points of the bracket become engaged with the cord or chain.

In Figs. 1 and 3 we have represented the weights for closing the upper sash as provided with buffers E, upon which the released weights for overbalancing the upper sash may fall, the buffers acting to decrease the shock and prevent breakage of the cord or chain. We have represented the buffer as an annular plate upon the outer end of a coiled spring e, which rests upon the upper surface of the weight and is held by the neck of the weight and a link passing from the neck to the end of the cord or chain; but any other suitable buffer may be used.

We have represented in Fig. 8 the sash-closing weight as mounted upon the upper sash, as held thereto by fusible solder, and as adapted to be released therefrom and to then engage the lower sash. H represents the weight of this modification. h is a pocket of metal for holding the weight to the upper sash and which is united to the upper sash by fusible solder. h' is a guiding-rod attached to the lower sash at h^2 and guidable on the upper sash by guide h^3. Rod h passes through the weight and is movable with respect thereto and by it weight H is guided and held after it has become detached from the upper sash, the weight then falling down said rod to its lower end, where it may be received by the buffer h^4, which is the equivalent of the buffer E. By this structure the upper sash is balanced by its usual weight and a detachable auxiliary weight. The lower sash is balanced in the usual way by balancing-weights, and upon necessity for the automatic closing of the sashes by fire the auxiliary weight of the upper sash becomes detached from it, thereby allowing the sash to be closed upward by the weights, which then overbalance it, and at the same time the auxiliary weight released from the upper sash is received by the lower sash and with the lower sash overbalances its weights and causes it to close automatically. The sashes may be provided with one or more of these weights.

We have shown in the drawings one side only of the window-sashes and window-casing and one only of the weights. The other side of the window sashes and casing and the arrangement of the weights and cords at such side are the same as above described.

We have shown and described the window-sashes with weights contained in pockets in the casing on both sides; but we would say that one arrangement or set of weights upon one side of the sashes may be used alone, and we desire to be understood that we do not limit the invention to a structure which involves the employment of the weights upon both sides of the window-sashes or as held in the pockets of the window-casing.

Having thus fully described our invention, we claim and desire to secure by Letters Patent of the United States—

1. The combination of a window-casing and window-sashes movable in the casing, one movable upward to open the window from the bottom of the casing and another movable downward to open the window from the top of the casing, balancing-weights connected with the sashes to balance them and hold them in any open position to which they may be moved, and means for releasing, in case of undue heat in the vicinity of the sashes, a portion of the balancing-weight of one sash and for operatively combining said released weight with the other sash or its weight, whereby by the release and transfer of the said weight the equilibrium of the sashes is

destroyed and both sashes become out of balance and, if open, are closed automatically and held closed.

2. The combination of a window-sash, one or more balancing-weights therefor, each carrying a buffer, and one or more sash-closing weights adapted to be released by undue heat and to then be received by said buffer or buffers, as and for the purposes set forth.

3. The combination of the upper window-sash, the lower window-sash, balancing-weights for the upper window-sash, balancing-weights for the lower window-sash, a weight carried by the lower window-sash forming a part of its entire weight, detachably secured thereto and adapted to be released therefrom by undue heat, and means connecting the said weight with the upper window-sash whereby upon its release from the lower sash its weight is combined with that of the upper sash and the said upper and lower sashes thus unbalanced with respect to their balancing-weights, whereby both the sashes will be automatically closed, as and for the purposes set forth.

4. The combination of a window-casing, a window-sash movable upward in the casing to open the window, balancing-weights contained in the pockets of the window-casing, cords connecting said weights with the window-sash and means for releasing in case of undue heat in the vicinity of the sash one or more of said weights from the sash, whereby the sash may then overbalance the remaining weight or weights and, if raised, automatically move downward to close the window.

5. The combination of a window-casing, a window-sash adapted to be raised and lowered in the casing, two sets of weights a, a' to balance the sash, the cords a^2, a^4 connecting the weights with the sash-frame, the cords a^4 being connected with the sash-frame by means detachable by undue heat in the vicinity of the window-sash, as and for the purposes set forth.

6. The combination of a window-casing, a window-sash vertically movable downward in said casing to open the window, its balancing-weights, cords connecting its balancing-weights with the sash, an overbalancing weight or weights, non-operative during the ordinary use of the window and means for releasing said weight or weights, operative by undue heat at or near said window-sash, whereby the said weight or weights are then allowed to combine with the balancing-weights and to assist them in lifting said sash, if open, to a closed position.

EZEKIEL VAN NOORDEN.
HENRY C. SMITH.

In presence of—
F. F. RAYMOND, 2d,
J. M. DOLAN.