Dec. 15, 1925. 1,565,938

B. HAUSMAN

METAL WINDOW

Filed Sept. 16, 1921

Fig. 1.

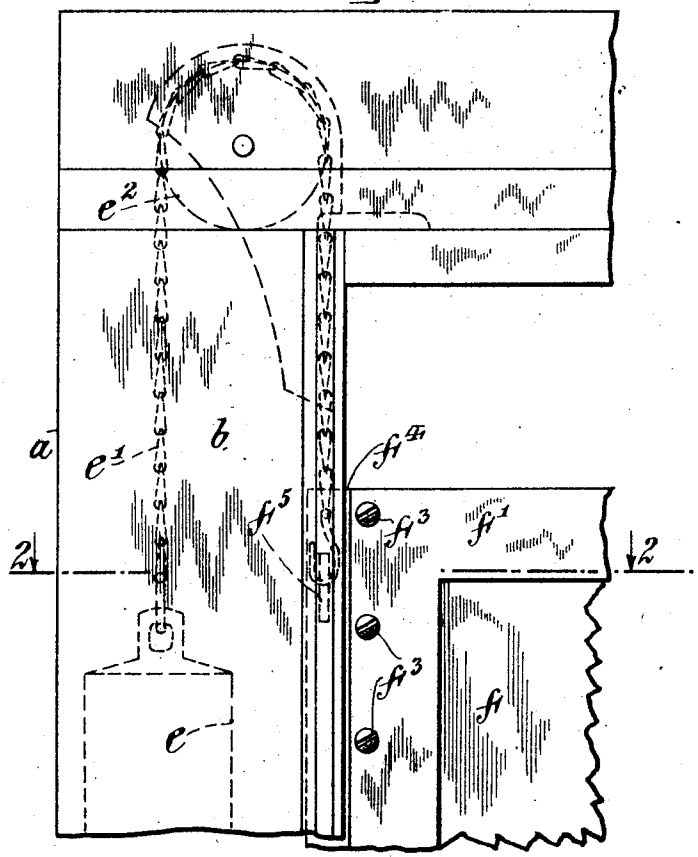


Fig. 2.

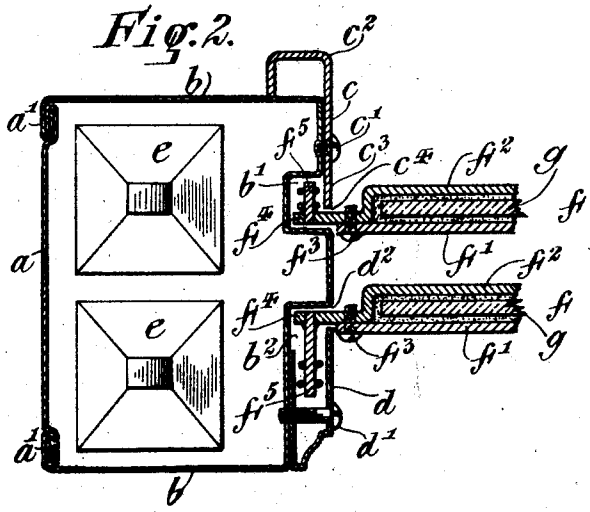
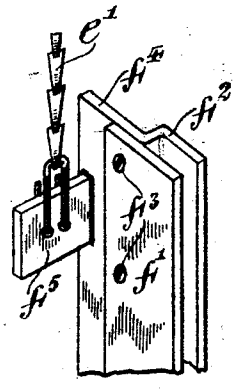


Fig. 3.



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UNITED STATES PATENT OFFICE.

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METAL WINDOW.

Application filed September 16, 1921. Serial No. 501,059.

To all whom it may concern:

Be it known that I, BERNARD HAUSMAN, a citizen of the United States, residing in the borough of Manhattan of the city of New York, in the State of New York, have invented certain new and useful Improvements in Metal Windows, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

This invention relates to the construction of metal windows and is concerned particularly with the vertical sections or sides of the frames and the counterbalancing of the sashes. It is generally considered desirable that the vertical axis of each counterbalancing weight be in the plane of the sash to which it is connected. Window sashes of wood or of hollow metal construction are usually of considerable thickness and the sides of the frames are correspondingly of so much thickness that there is generally enough room to hang readily the ordinary counterbalancing weights, approximately square in cross section, with their vertical axes in the planes of the respective sashes. When, however, the sashes are made of solid metal, they are frequently so thin that the sash weights, sufficiently heavy to counterbalance the sashes, cannot be placed with their axes in the planes of the sashes. In one type of construction it has been proposed to let the two sash weights at each side have a cross section other than square, and place the weight with its longest diameter substantially in the plane of the corresponding sash, but this requires frequently special weights and special construction of the window frames, with an undue depth, which latter tends to reduce the light area of the window. In another construction it has been proposed to place the sash pulley with its axis oblique to the plane of the sash, which in practical operation will prove objectionable for many reasons. One object of the invention is to provide means whereby these difficulties can be overcome and in accordance therewith one of the sashes (upper or lower), or, if necessary, each of the sashes, is provided at each side with an arm which projects from the plane of the sash toward and beyond the plane of the vertical axes of the two corresponding sash weights, so that the sash chain can be connected to the sash in the plane of vertical axes of the sash weights. The axis of rotation of the sash pulley is at right angles to the plane of the sash and to the plane of the vertical axes of the sash weights and there is consequently no twisting and no friction in the movement of the chain of the sash, which could impede its free travel. A further purpose of the invention is to provide for the complete enclosure of the sash chain, so that no part of it shall be visible. Still another object of the invention is to provide for the side frame a staff and stop bead, independent of the frame, which can be made of heavy metal and therefore be relied upon to stiffen the frame without requiring like heavy metal to be used in the construction of the frame and can also be made of galvanized stock, to prevent rust, while the frame can be made of black iron or steel. The invention will be explained more fully hereinafter with reference to the accompanying drawing in which it is illustrated and in which—

Figure 1 is a view in elevation of so much of a window frame and sash as is necessary to enable the invention to be understood, the sash weight, chain and pulley being indicated in dotted lines.

Figure 2 is a view in horizontal section on the plane indicated by the broken line 2—2 of Figure 1.

Figure 3 is a detail view in perspective illustrating the connection between the chain and the sash.

In the embodiment of the invention illustrated in the drawing, each of the two hollow vertical frames (only one of which is necessary to be shown) is formed of two sheets of metal *a* and *b*. Sheet *a* is a flat sheet and forms that portion of the vertical frame which is adjacent to the building wall. The two sheets *a* and *b* are united in any suitable manner, as indicated at *a'*. The sheet *b* preferably forms three sides of the vertical frame and is imperforate or so formed, in conjunction with other parts to be mentioned, as to avoid vertical openings through the metal. For this purpose it is formed, on

the side adjacent the sashes, with a recess b' for co-operation with the upper sash as hereinafter described, and with a recess b^2 for co-operation with the lower sash. As the sheet b is imperforate, that is, is not slotted vertically for co-operation with either of the sashes, comparatively light metal can be used in its construction, especially if its stiffness at the exposed outer edge is increased by the combined staff and stop bead c of L-shape which may be made of heavier metal and secured to the sheet b by any suitable means, as by screws, one of which is indicated at c'. The outer portion c^2, which is turned back upon itself as indicated, forms a stiff staff bead, while the inner edge c^3 overlaps the recess b' formed in the sheet b and forms a guide c^4 for the co-operating portion of the upper sash. This combined staff and stop bead, which is exposed to the weather, can also be made of galvanized or other anti-rusting stock, to resist rust, while the frame can be made of black iron or steel. At its inner edge the vertical frame b, also stiffened by the hollow stop bead d, which may be secured to the sheet b by any suitable means, as by screws d', being seated in the recess b^2. This stop bead forms a guideway d^2 for co-operation with the lower sash and it also forms a complete enclosure for the sash chain, which is thus desirably concealed from view and yet will also admit ready recess in case of breakage of chain, etc.

The vertical frame b receives the sash weights e, e for each sash both of which may be of the usual form, being substantially square in cross section, while provision is made, as now described, whereby each sash chain e' is connected to the corresponding sash in the plane of the two sash weights on opposite sides of the window, parallel with the sash itself and the axis of the sash pulley e^2 remains at right angles to the plane of the window. Each of the sashes f may be formed as usual in windows of the character indicated, having an inner plate f' and an outer plate f^2. These two plates receive the glass g between them and are secured together by screws or rivets f^3, while the edge of one of the plates, as the plate f^2, is extended toward the frame, as at f^4, to enter the guideway c^4 or d^2 and guide the sash in its up and down movements. To such extended edge of the sash is secured, as by slotting and welding, an arm f^5 which is extended laterally from the member f^2, f^4, across the plane of the vertical axes of the two sash weights which are to be connected to the corresponding sash. The relative lengths and positions of the arms f^5 of the two sashes will be determined by the cross section of the side frame and the relations of the sashes to the side frame. In the arrangement shown, the arm f^5 of the upper sash is preferably turned outwardly and is quite short. It moves in the recess b' formed therefor and it and the chain are protected by the overlapping edge of the combined staff and stop bead c. The arm f^5 of the lower sash, in the arrangement shown, is longer and is turned inwardly, moving within the hollow stop bead d. By this arrangement both sash weights e, at both sides of the window, are of the usual form, which might be either approximately square in cross section and each is connected to the corresponding sash at a point which is in the plane of the vertical axes of the two sash weights at opposite sides of the corresponding sash, while the axis of rotation of the sash pulley is at right angles to the plane of the sash. It will be understood that an opening or pocket is provided for on the inner part of each vertical member of the window frame, directly back of the inner stop bead and thus covered by it, for the insertion of the weights into the window box and for their ready access, when required.

It will be understood that details of construction and arrangement can be varied to suit different conditions of use and that the invention, except as pointed out in the claims, is not limited to the precise construction shown and described herein.

I claim as my invention:

1. In a metal window, the combination of a hollow vertical frame member having its side adjacent to the sash imperforate and formed with a recess and a combined staff and stop bead secured to the frame and overlapping the recess to form a guideway for the sash and a channel for the sash chain.

2. In a metal window, the combination of a hollow metal vertical frame member having its side adjacent to the sash imperforate and recessed and a hollow metal stop bead secured to said frame member in said recess to form a guideway for the sash and a channel for the sash chain.

3. In a metal window, the combination of a hollow vertical frame member, a sash having an extended portion to co-operate with said frame member in the movement of the sash, a sash pulley having its axis at right angles to the plane of the window, a sash weight and chain the weight being thicker than the sash and having its axis offset from the plane of the sash, and an arm extended from the extended portion of the sash in a direction at right angles to the plane of the sash to the plane of the vertical axis of the sash weight, parallel with the sash in a vertical plane and having the sash chain connected thereto.

4. In a metal window, the combination of a hollow metal vertical frame member having its side adjacent the sash, imperforate and formed with a vertical recess, a sash having a portion extended into such recess

to co-operate therewith in the movements of the sash, a sash weight and chain and an arm extended from the extended portion of the sash in a direction at right angles to the plane of the sash to the plane of the vertical axis of the sash weight parallel with the sash and having the sash chain connected thereto, and a stop bead secured to said frame member in operative relation with the recess and forming therewith a guide for the sash and a channel for the laterally projecting arm and the chain.

This specification signed this 14th day of Sept. A. D. 1921.

BERNARD HAUSMAN.