

No. 887,470.

PATENTED MAY 12, 1908.

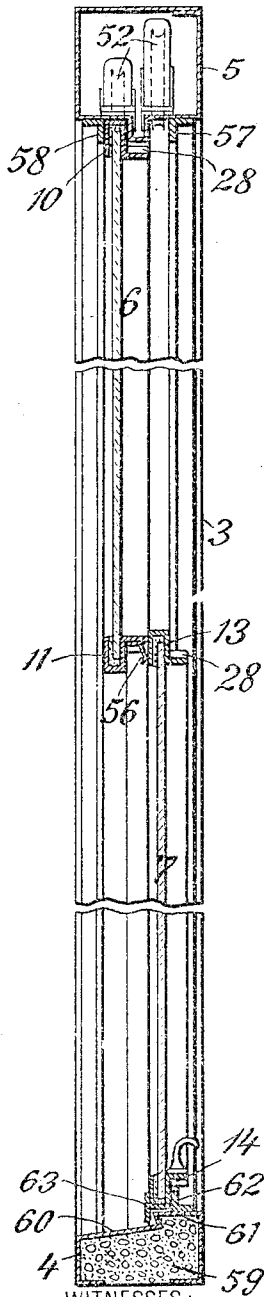
E. FLAGG.

METAL WINDOW SASH.

APPLICATION FILED FEB. 6, 1907. RENEWED APR. 10, 1908.

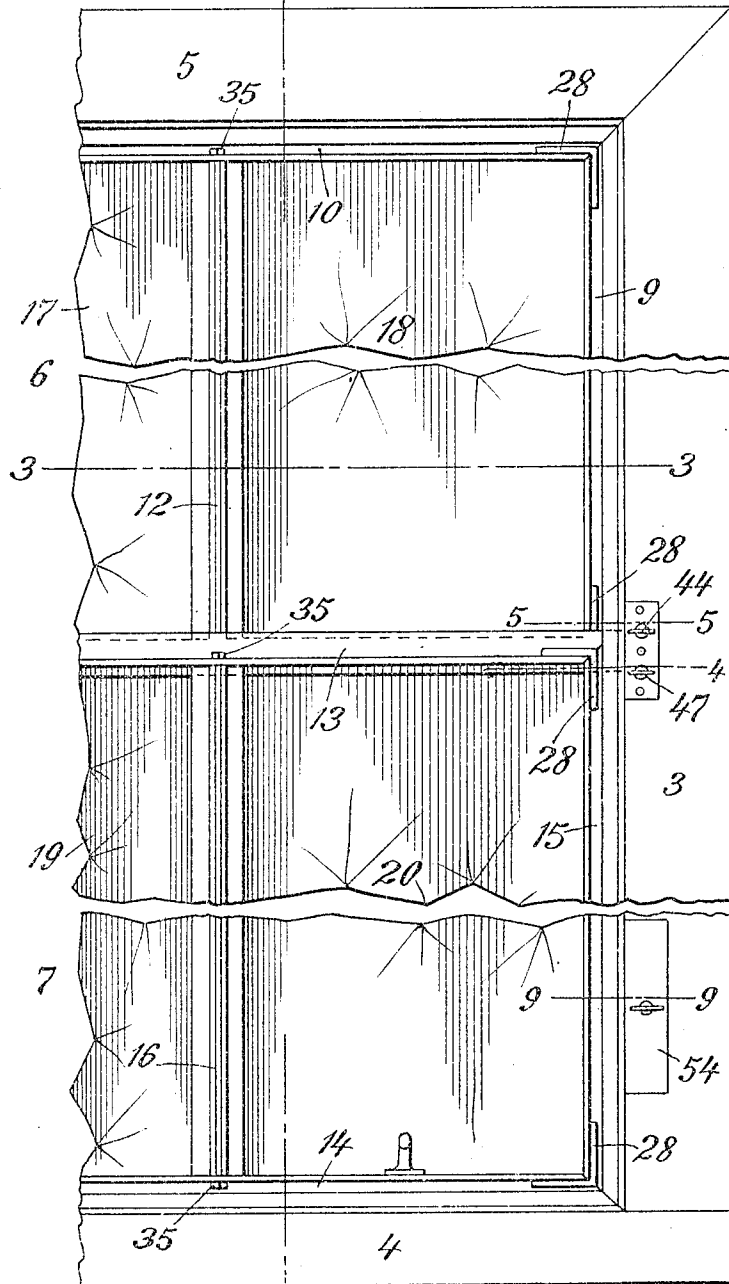
2 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:
Frederick A. Blount.
Frank Connor

FIG. 2.



INVENTOR

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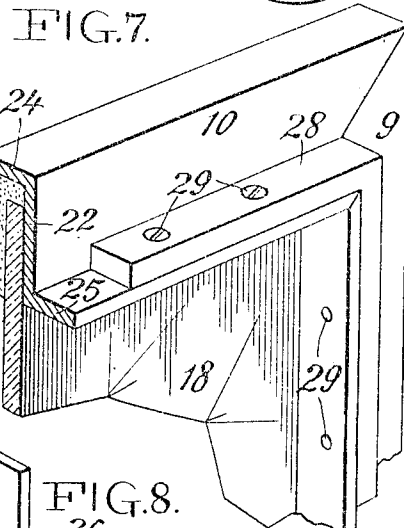
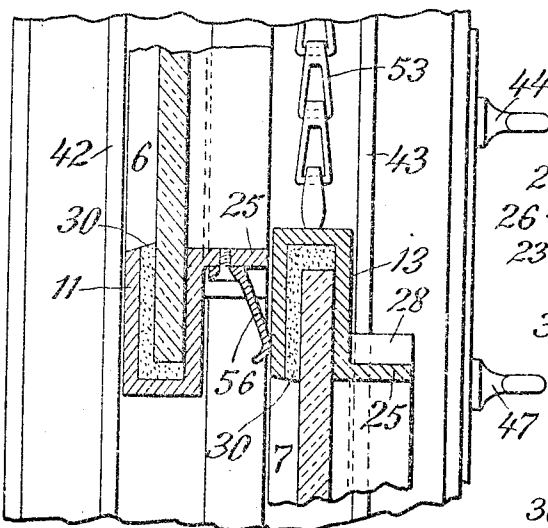
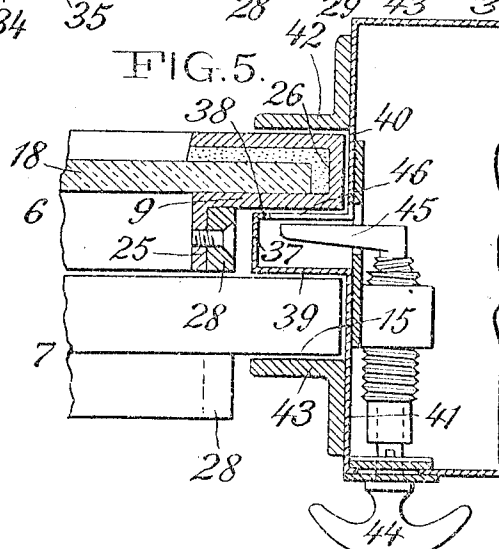
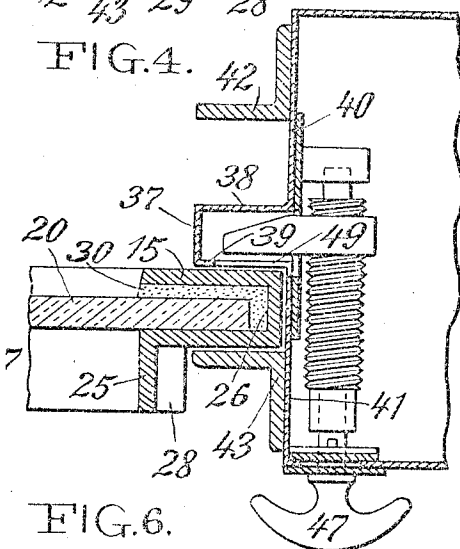
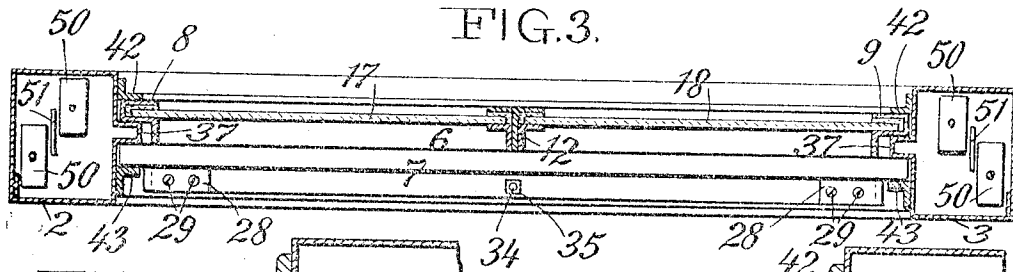
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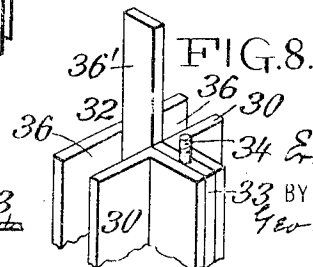
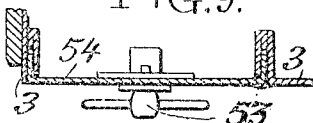
APPLICATION FILED FEB. 6, 1907. RENEWED APR. 10, 1908.

2 SHEETS—SHEET 2.



WITNESSES:
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FIG. 9.



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UNITED STATES PATENT OFFICE.

ERNEST FLAGG, OF NEW YORK, N. Y.

METAL WINDOW-SASH.

No. 887,470.

Specification of Letters Patent.

Patented May 12, 1908.

Application filed February 6, 1907, Serial No. 355,974. Renewed April 10, 1908. Serial No. 426,315.

To all whom it may concern:

Be it known that I, ERNEST FLAGG, a citizen of the United States, residing at New York city, county and State of New York, have invented certain new and useful Improvements in Metal Window-Sashes, of which the following is a specification.

This invention relates to window construction and particularly to window construction of the metallic type.

The object of the invention is to so shape, proportion, and combine the various elements of a window, comprising sash, frame, etc., that the structural qualities peculiar to bent metal will be employed advantageously, to minimize the amount of material necessary to such construction thereby making the window frame as a whole very much less in weight and easier to be moved.

In this general type of window it is customary to provide a sash and one or more panes seated thereon, so that a metal surface or part is on each side of the margin of the pane, the pane being held positively by the sash.

A further object of this invention is broadly to provide for a ready adjustment as an entirety or any of the rails of the sash, thereby making the removal of the glass very simple and easy of accomplishment.

A further object is to provide an efficient reinforcing means for the corners of the sash, which shall be readily accessible and may be easily and quickly detached.

Further objects are to provide an efficient metal muntin and bent metal sash rail; furthermore, to provide a sash comprising bent metal rails of the same cross-section; and also to provide a suitable metallic window frame which will cooperate with such a sash.

The end and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings forming part hereof, in which:—

Figure 1 is a sectional elevation taken through line 1—1 of Fig. 2; Fig. 2 is an interior elevation of the window, but with parts broken away; Fig. 3 is a horizontal section through line 3—3 of Fig. 2, but showing window complete; Fig. 4 is an enlarged detail section taken along line 4—4 of Fig. 2, showing the locking device for the lower sash; Fig. 5 is an enlarged detail section taken along line 5—5 of Fig. 2, showing the locking device for the upper sash; Fig. 6 is an

enlarged detail section showing the meeting ends of the upper and lower sashes; Fig. 7 is an isometric view of a portion of the top and side rails of the sash, and showing the reinforcing angle iron; Fig. 8 is an isometric view showing in detail the end of the muntin; and Fig. 9 is an enlarged detail section taken along the line 9—9 of Fig. 2, showing the closure for the opening in the jamb by which access may be had to the sash weights.

Referring now more in detail to the drawings;—1 designates the window frame, which comprises jambs 2 and 3, sill 4, and head 5. The upper and lower sash are designated by 6 and 7 respectively. Fig. 6 as shown, comprises stiles or vertical rails 8 and 9, top rail 10, bottom rail 11, and muntin 12. The top rail of sash 7 is designated by 13, the bottom rail by 14, the right hand stile by 15, and the muntin by 16.

Although one muntin 12 is illustrated separating panes 17 and 18 in sash 6, and one muntin 16 separating panes 19 and 20 in sash 7, it is understood that each sash may be provided with any number of vertical and horizontal muntins; or with none at all, as may be desired. In the latter case, each sash will contain but a single pane.

It is preferred that each sash rail be of the same uniform cross-section, and preferably that shown in the drawings. The cross-section of the sash rail is clearly shown in Figs. 4 to 7 inclusive. A single strip of sheet metal is bent on itself to form a rectangular molding 21, U-shape in cross-section, having parallel faces 22 and 23 substantially at right angles to face 24. The edge of the metal strip continuing from face 22 is bent out at right angles to form a border or marginal flange 25. By this construction, the inclosed portion of the molding constitutes a groove pane seat 26, while the exterior faces 22, 23, and 24 form the runner member for the vertical rails or stiles. This rail construction may be made in stock lengths, and then cut into proper lengths for the respective sash rails, each rail being preferably mitered at its ends.

Fig. 7 shows my preferred manner of connecting the abutting rails. A reinforcing angle iron 28, preferably of the same width as the marginal flange 25, is employed at each corner of the sash. The sash rail or stile 9 is abutted with its mitered end against the mitered end of rail 10, and the angle iron is placed with its legs extending upon the abutting marginal flanges. The legs of the angle

iron and the marginal flanges 25 are tapped to receive screws 29, which extend through the flanges and clamp the parts securely together. The angle irons thus constitute the fastening means for securing the sash rails together, and also form an efficient reinforcement for the corners. By removing the screws 29 from two adjacent corners, the corresponding rail may be detached and removed as an entirety, and it is evident that in like manner two or more of said sash rails may be detached. This feature permits a pane to be easily inserted or removed from the groove seats of the sash. Cement 30 may be used in seats 26, as shown. The reinforcing angle irons are upon the outside of the sash, where they are always readily accessible.

The sash bar or muntin, shown in detail in Fig. 8, comprises two angle irons or strips 30, and a T-iron or strip 32. The latter may be formed by suitably uniting two metal strips. The tongue 33 of the T-iron is of sufficient width to serve as a separating wall or partition, and to extend flush with the angle pieces 30 30. It is provided on either end with a screw 34, and an extension 36', corresponding in length with the groove pane seat 26. The several parts of the muntin may be secured together in any suitable manner; so as to form groove pane seats 36 on either side of the tongue of the T-iron, between the head of said iron and the projecting wings of the angle irons.

When a sash is built up from rail construction of the section shown, the ends of the muntin abut against the inner faces of the marginal flanges 25 of the top and bottom sash rails respectively, the extensions 36' fitting snugly in the pane seats 26, and the screws 34 projecting through the holes provided in the flanges 25. When the muntins are locked in position by threading nuts 35 upon the ends of the screws 34, the muntins provide intermediate groove seats for the panes, and constitute a rigid intermediate brace for the top and bottom sash panes.

Each jamb comprises a bent metal shell formed of a single strip of metal. The pulley face of each jamb is formed with an integral parting ridge 37, with vertical side edges 38 and 39, at right angles to the faces 40 and 41 of the jamb. The sash slide in the rabbets on opposite sides of this parting ridge, as shown. The outer portions of the stiles or vertical rails 8 9 slidably engage the vertical faces 38 and 39, and are retained in place by vertical guides, preferably angle strips 42 43, which are removably secured to jambs as shown.

Mounted in the jamb there may be provided clamping devices or sash fasts. In Fig. 5, such a fast is indicated at 44, having a jaw 45, which may be clamped against the rail 9, through the hole 46, provided in the vertical face 38. Another construction of a

sash fast is shown in Fig. 4, at 47, having a jaw which may be clamped against the rail 15, through the hole 49, provided in the vertical face 39.

Each jamb provides suitable runways for sash weights, indicated by 50. A separating strip 51 may be provided as shown.

52 indicates suitable pulleys over which the cords or chains 53 may run.

Removable sections may be provided in the jambs to give access to their interior, such a section being indicated by the closure 54. This closure, shown in enlarged detail section in Fig. 9, consists of a metal plate having inturned edges adapted to fit in grooves formed by the folded metal rims about the opening in the side 3 of the jamb, and it may be locked in position by a clamp or thumbpiece 55. In the embodiment of the invention illustrated, the parting ridges 37 separate the sash a distance slightly more than the width of the marginal flange 25. In order to prevent rattling, the lower rail of the upper sash is provided on the under side of the marginal flange 25 with a spring 56, as illustrated in Fig. 6. When the window is closed, the spring 56 engages the outer face of the top rail of the lower sash, in the manner shown, and prevents the rattling of either sash.

The head 5 is similar to the jambs 2 and 3, and is provided in the same manner with angle strips 57 58, to close against the outer face of the sash rails.

The sill 4 comprises a bent metal shell, open at the bottom, and preferably filled with concrete, indicated by 59. Its upper face has an exterior inclined portion or shed 60. A horizontal ledge 61 runs along its inner edge, and partly overlies the shed 60. An angle strip 62 is preferably secured to the ledge 61, to face against the lower rail of sash 7. A depending weather strip 63 may be secured to the outer face of the lower sash rail, which will pass below the ledge 61.

It is understood that this invention is not limited to the embodiment shown, and that many parts may be modified within the scope of this invention; and furthermore that many individual elements and combinations of elements would still be within the scope of the invention, when combined with widely varying window construction.

A window constructed as hereinbefore described will be water and fire proof and will have the maximum of strength and rigidity with a minimum of weight. My construction also provides a window which is practically wind and dust proof and thus dispenses with the additional weather strips or flanges heretofore found to be necessary.

This invention, comprises features which enable metallic window frames and sash to be constructed at a lower cost and with less material than heretofore; and great reduction

in the weight of the moving parts is effected without impairing the strength or durability, and further effects a great economy in the maintenance of the completed structure.

5 Having thus described my invention, I claim:

1. In window construction, a sash comprising metal pane seating rails, each having an inner marginal flange, and means for detachably securing said flanges together.

2. In window construction, a sash comprising metal pane seating rails, each having an inner marginal flange and reinforcing means for the corners of the sash detachably secured to the abutting ends of the flanges.

3. In window construction, a sash comprising metal pane seating rails, each having an inner marginal flange and reinforcing angle irons for the corners of the sash secured to the marginal flanges.

4. In window construction, a sash comprising top, bottom and side pane seating rails, and exterior reinforcements for each corner detachably secured to the abutting ends of the rails.

5. In window construction, a sash comprising top, bottom and side pane seating rails each having an inner marginal flange, and one or more intermediate muntins, and means for detachably securing said muntins to the flanges of the top and bottom rails.

6. In window construction, a sash comprising top, bottom and side pane seating rails each having an inner marginal flange, and one or more intermediate muntins, means for detachably securing the abutting ends of the marginal flanges, and means for detachably securing said muntins to the flanges of the top and bottom rails.

7. In window construction, a sash comprising metal pane seating rails, each consisting of a sheet of metal bent into a single open channel constituting the pane seat and a marginal flange projecting perpendicularly from the inner edge of one face.

8. In window construction, a sash comprising metal pane seating rails, each consisting of a sheet of metal bent into a single open channel constituting the pane seat and provided with an exterior strengthening rib.

9. In window construction, a sash comprising metal pane seating rails, each consisting of a sheet of metal bent into a single open channel constituting the pane seat and provided with an exterior strengthening rib, and means for detachably securing the abutting ends of the said ribs together.

10. In metal window construction, a sash comprising a plurality of bent metal rails, each of said rails having an interior pane seat, and an inner marginal flange constituting a strengthening rib.

11. In metallic window construction, a sash comprising a plurality of bent metal rails, each of said rails having an interior

pane seat and a marginal flange, and means for detachably securing the flanges together.

12. In metallic window construction, a sash comprising a plurality of bent metal rails, each of said rails having an interior pane seat and a marginal flange, and means for reinforcing the sash comprising angle pieces detachably secured to the abutting ends of the flanges.

13. In metallic window construction, a sash comprising top, bottom and side metal pane seating rails and one or more intermediate metallic muntins, means for detachably securing the top and bottom rails to said muntin or muntins, and means for securing the side rails to the top and bottom rails.

14. In metallic window construction, a sash comprising bent metal pane seating rails, and exteriorly located means for reinforcing the corners and detachably securing the rails together.

15. In metallic window construction, a sash comprising top, bottom and side pane seating rails of the same cross-section, said rails having a marginal stiffening flange projecting at right angles to the rails, and means for detachably securing the abutting ends of said flanges.

16. In metallic window construction, a sash comprising top, bottom and side pane seating rails of the same cross-section, said rails having a marginal stiffening flange projecting at right angles to the rails, and means for detachably securing the abutting ends of said flanges, said means constituting a reinforcement for the corners of the sash.

17. In metallic window construction, a sash comprising a plurality of integral bent metal rails, each of said rails comprising a U-shaped body portion providing an interior pane seat and an inner marginal flange perpendicular to the body portion.

18. In metallic window construction, a sash muntin comprising a T-shaped strip, and angle strips on either side of the tongue of said T-shaped strip and spaced from the head thereof to provide opposite pane seats.

19. In metallic window construction, a sash muntin comprising a T-shaped strip, and angle strips on either side of the tongue of said T-shaped strip, and spaced from the head thereof to provide opposite pane seats, and attaching means on either end of said muntin.

20. In metallic window construction, a bent metal sash provided with a groove pane seat for embracing the margin of a pane, a muntin for said sash comprising angle strips spaced to provide opposite pane seats, the tongue of one of said angle pieces constituting a central longitudinal abutment and having an extension beyond said strips and adapted to enter said groove pane seat of the sash.

21. The combination with the meeting rails of an upper and lower sash, each comprising bent metal strips having a projecting flange, of means secured to one rail for
5 yieldingly engaging the other rail.

22. The combination with the meeting rails of an upper and lower sash, each comprising bent metal strips having a projecting flange, of means secured to the flange of
10 one rail for yieldingly engaging the other rail.

23. The combination with the meeting rails of an upper and lower sash, each comprising bent metal strips having a projecting flange, of a spring secured to the under
15 side of the flange on the upper sash for engaging the face of the rail on the lower sash.

24. A window-frame having openings therein to afford access to the weight-boxes,

the edges of the openings being folded inwardly and returned to form grooves, and closures for said openings having inwardly
20 turned edges to fit into said grooves.

25. A window-frame having openings therein to afford access to the weight-boxes, the edges of the openings being folded inwardly and returned to form grooves, closures for said openings having inwardly
25 turned edges to fit into said grooves and means for locking the closures in position.

In testimony whereof, I affix my signature, 30
in the presence of two witnesses.

ERNEST FLAGG.

Witnesses:

FREDERICK A. BLOUNT,
FRANK O'CONNOR.