

No. 887,738.

E. FLAGG.
METAL WINDOW SASH.
APPLICATION FILED FEB. 9, 1907.

PATENTED MAY 12, 1908.

2 SHEETS—SHEET 1.

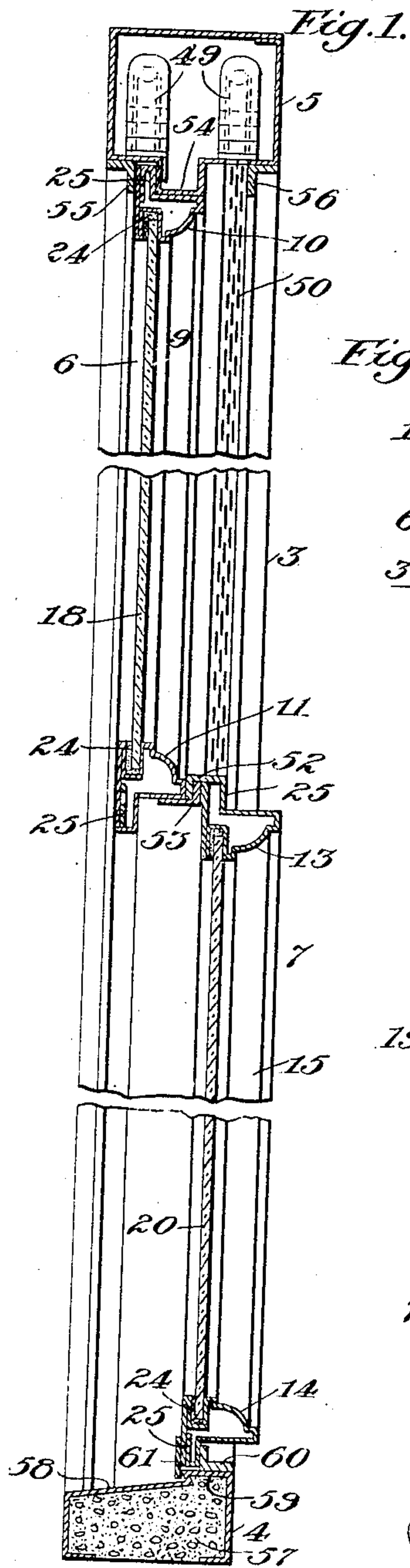
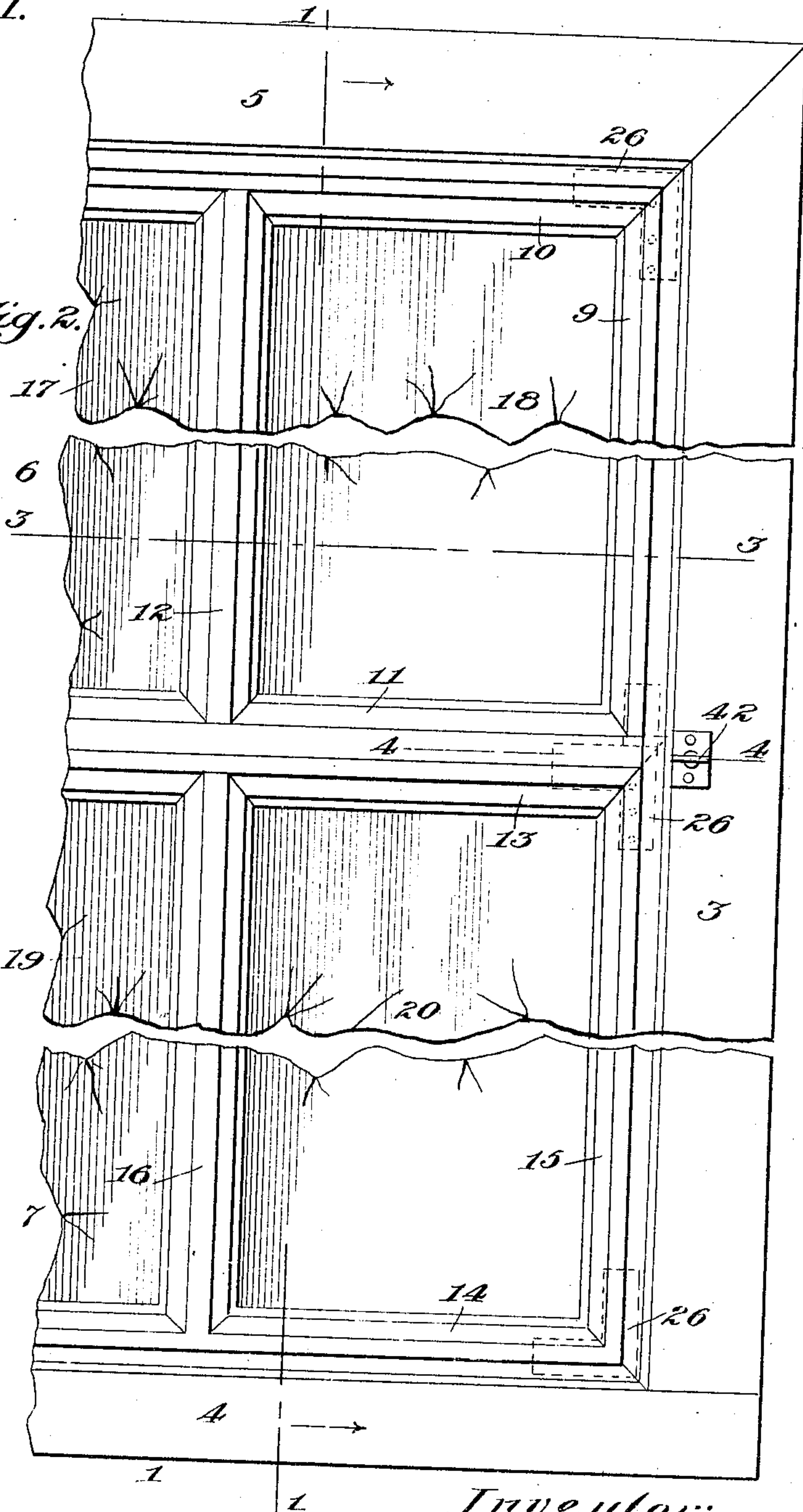


Fig. 2.



Witnesses:

Geo. E. Kuntz
Francis E. Alden

Inventor:

Ernest Flagg
Geo. H. Benjamin
Att'y.

No. 887,738.

PATENTED MAY 12, 1908.

E. FLAGG.
METAL WINDOW SASH.
APPLICATION FILED FEB. 9, 1907.

2 SHEETS—SHEET 2.

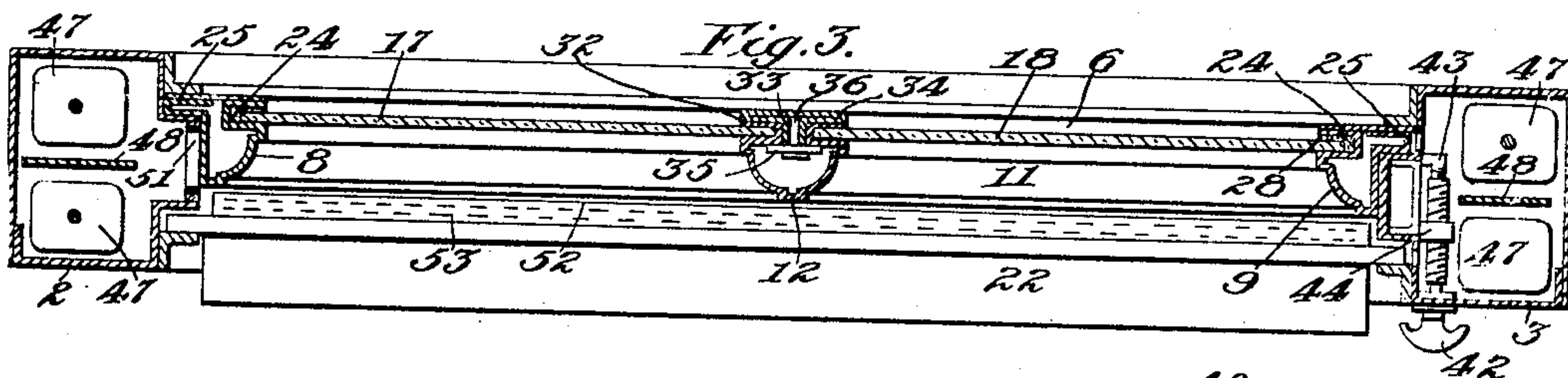


Fig. 5.

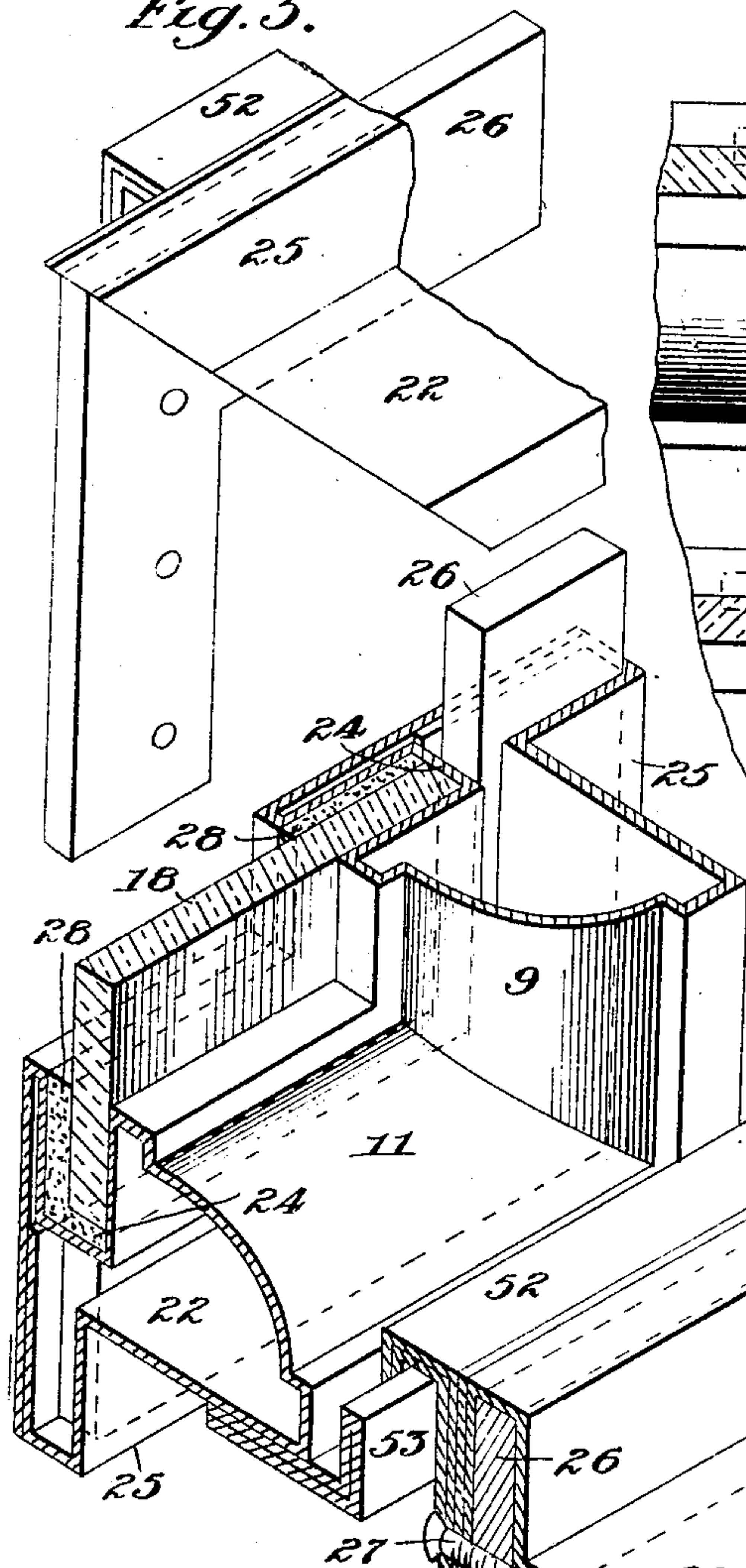


Fig. 4.

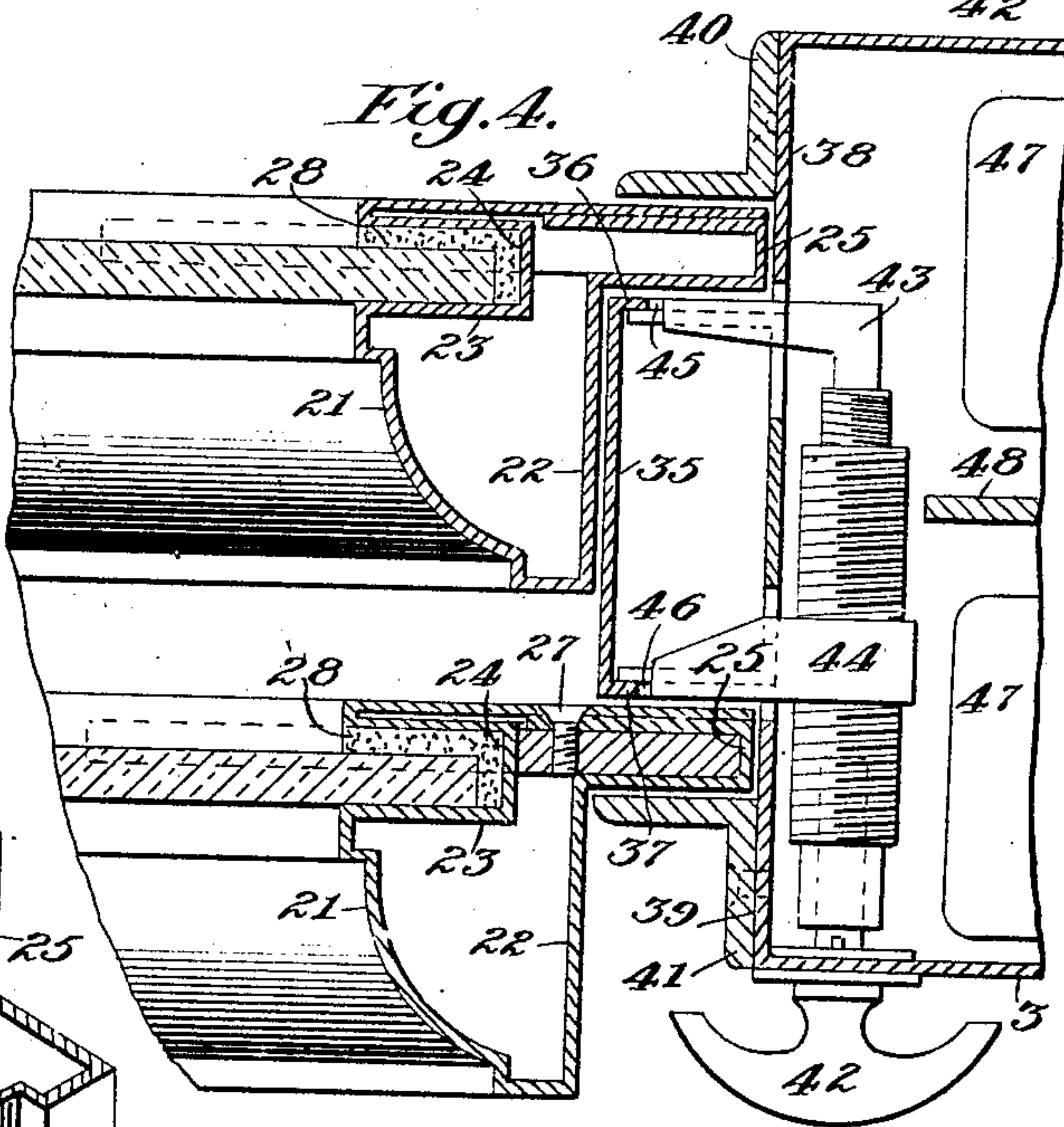


Fig. 6.

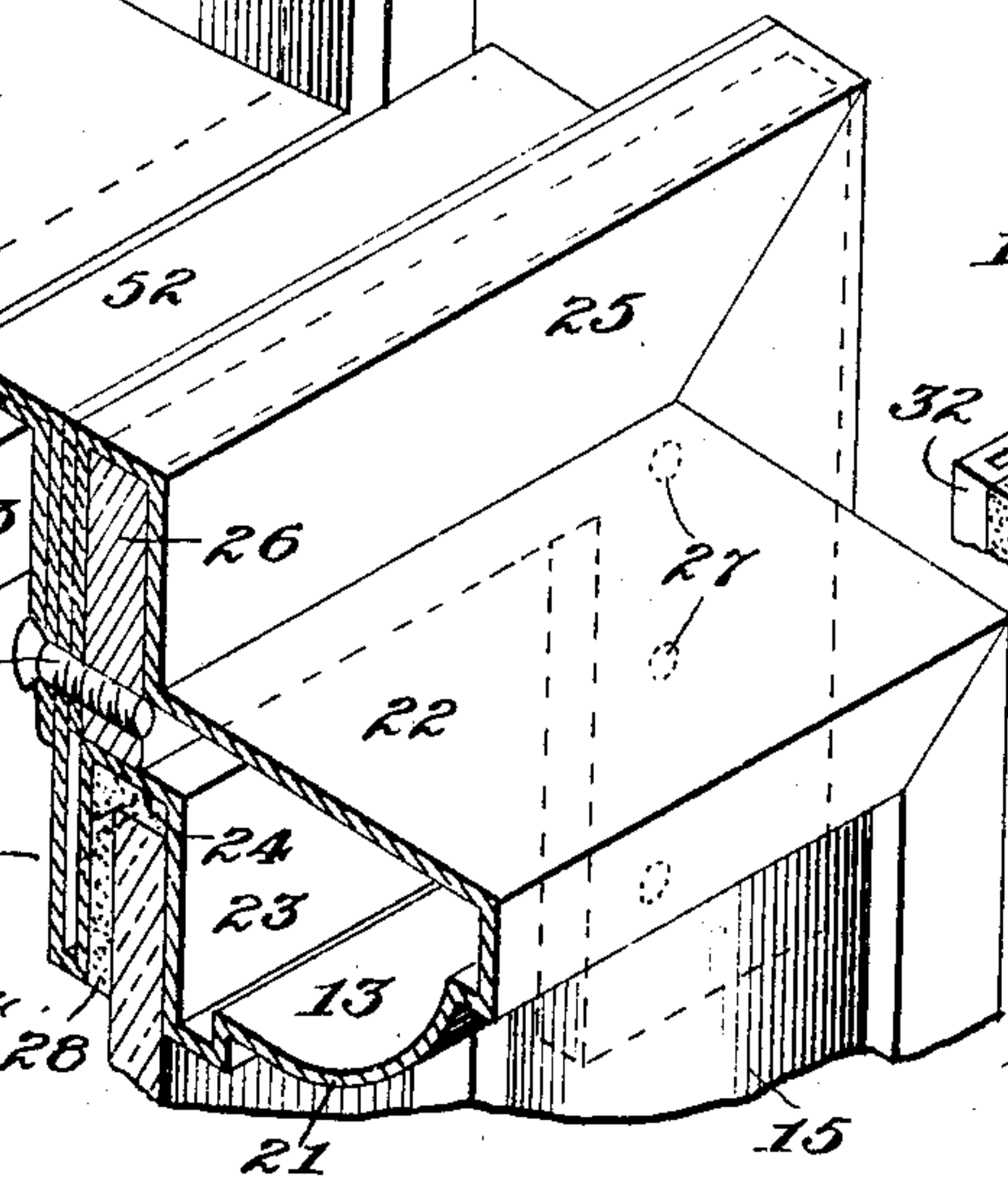
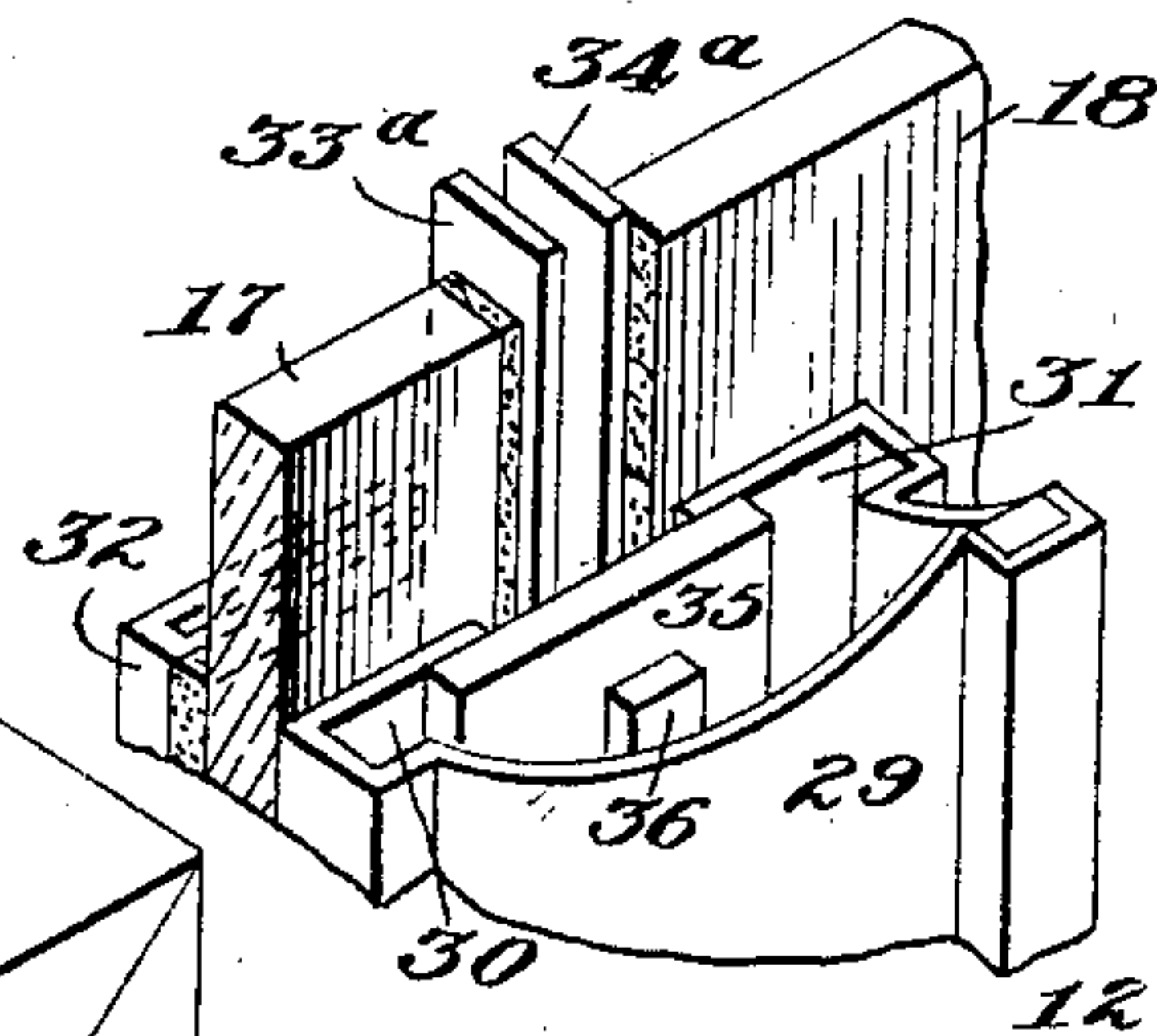


Fig. 7.



Witnesses:
J. E. Clavett
Francis S. Elden

Inventor:
Ernest Flagg
J. E. Clavett
Benjamin
Att'y.

UNITED STATES PATENT OFFICE

ERNEST FLAGG, OF NEW YORK, N. Y.

METAL WINDOW-SASH.

No. 887,738.

Specification of Letters Patent.

Patented May 12, 1908.

Original application filed October 20, 1906. Serial No. 339,783. Divided and this application filed February 9, 1907. Serial No. 356,553.

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-Sash, of which the following is a specification.

This invention relates to window construction of the metallic type and particularly to the sash construction disclosed in my copending application, Serial No. 339,783, filed October 20, 1906, of which this application is a division.

An 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 material and the labor necessary for the construction of a satisfactory fireproof bent metal window. In this general type of window it is customary to provide a sash and one or more panes seated therein, so that a metal surface or part is on each side of the margin of the pane, the pane, therefore, being held positively by the sash against lateral removal from either side somewhat as is the case with a door panel.

A further object of this invention is broadly to provide for the ready removal of a pane, thus held against lateral removal, by providing for the ready detachment as an entirety of one or more rails of the sash, preferably the top rail.

A further object is to provide efficient means for detachably connecting the removable rail to its abutting rails and also efficient means for securing said rail to a muntin, if a muntin is to be employed.

Further objects are to provide an efficient bent 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.

Still further objects are to combine and adapt various elements so as to cooperate in furthering the general object of this invention.

Reference should be had to the accompanying drawings forming part of this specification, illustrating an embodiment of the invention and in which:—

Figure 1 is a sectional elevation taken through line 1—1 of Fig. 2; Fig. 2 is an inter-

rior elevation of the window but with parts broken away; Fig. 3 is a horizontal section through line 3—3 of Fig. 2, but showing the window complete; Fig. 4 is an enlarged detail section taken along line 4—4 of Fig. 2, but with the top sash lowered and the bottom sash raised; Fig. 5 is an isometric view of the top rail of the lower sash and showing the corner angle iron; Fig. 6 is an isometric view showing the meeting rails of the top sash and the lower sash and the interlocking weather seal; and Fig. 7 is an isometric view showing in detail the end of a muntin in combination with two panes.

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. Sash 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 to be 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 case none were provided, each sash would 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 best shown in Figs. 4 and 6. A single strip of sheet metal is bent on itself along longitudinal lines to form the molding 21, which has a flat face 22 substantially at right angles to face 23. The edge of the metal strip continuing from face 22 is bent out at right angles to 22, then again at right angles to itself and then back at right angles to face 22, as shown to form part of flange 25. The edge continuing from face 23 is bent out at right angles, then parallel with face 23 and, on a line parallel with and flush with the outer edge of 23, it is doubled back upon itself. This bending forms a groove pane seat 24, which is approximately aligned with and substantially a counterpart of the flange 25 extending at right angles to face 22. This rail construction may be made in stock lengths; then cut into proper lengths for the

respective sash rails, each rail being preferably mitered at its ends.

Figs. 4 and 6 show a preferable manner of connecting abutting rails. Some reinforcement, such as an angle iron 26, has one leg inserted within the hollow flange 25 of a rail end. It is preferred that the width of each leg of 26 be sufficient to completely fill the space between the bottom face of pane seat 24 and the inner face of the outer edge of flange 25. In the upper part of Fig. 6 the abutting sash rail or stile 9 is abutted with its mitered end against the mitered end of rail 11 and with the other leg of angle iron 26 thrust into its flange 25. The rail ends are then secured one to another, if desired, by suitable means, such as soldering, brazing, or riveting, etc. In a similar manner each rail may be secured to the inclosed leg of the angle iron. It is, however, to be understood that the sash rails may be joined without the aid of the reinforcing angle iron 26. Nevertheless, it is preferred to employ the angle iron when joining the top rail of each sash to the abutting stiles. Such a joint is shown in Figs. 4, 5, and 6. In this case the legs of the angle irons 26 are tapped to receive screws 27, which extend through the side of the flange 25 to clamp the parts together. By removing the screws 27, the top rail may be readily detached and removed as an entirety. It may be replaced as readily. This feature permits a pane to be slid home in the groove seats 24 like a shutter, where it may be locked in place by the attaching of the top rail. Cement 28 may be used in the seats 24. Any number of sash rails may be joined to the abutting rails so as to be removable as an entirety, the same as has been described in connection with the top rails.

The sash bar or muntin, shown in detail in Figs. 3 and 7, comprises two bent metal strips and means to clamp them together. 29 is a molding strip with its two edges 30 and 31 bent inwardly as shown. The edges 30 and 31 engage the interior face of the panes as shown. A second metal strip 32 has each edge 33 and 34, doubled over on itself and then outwardly near the medial line of the strip as shown in Fig. 3. The outturned edges 33 and 34 form spacing abutments. A strip or series of washers 35 engage the edges 30 and 31 and by means of bolts 36 or their equivalent, which pass between the edges of the panes 17 and 18 and suitably engage the strip 32, the strip 32 is clamped towards the molding. The abutments 33 and 34 limit the clamping effect of bolts 36 upon the two strips which are preferably of such a depth that the space between the strip 32 and the edges 30 and 31 is the same as the width of the other pane seats 34. At each end of the muntin the molding 29 is cut off on a curve, so as to fit the molding of the sash rail, such as rail 10. The body por-

tion of strip 32 is preferably squared off, leaving projecting tongues 33^a and 34^a, being continuations of the abutments 33 and 34. These tongues are designed to fit snugly in a pane seat 24 of the sash rail and secure the muntin. If desired, they may be long enough to penetrate the bottom of the pane seat 24 or may merely engage the side walls of said seat and stop short of the bottom of the pane seat.

With a sash built up as described from rail construction of the section shown, there is provided a flange 25 on all edges of the sash and extending at right angles to a flat face 22. This flange forms the runner and weather flange for the sash, particularly that on the stiles.

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 35 with vertical stile edges 36 and 37 at right angles to the faces 38 and 39 of the jamb. The sash slide on opposite sides of these parting ridges, as shown. The sash flanges 25 slidingly engage the vertical faces 36 and 37 and are retained in place by vertical guides, preferably angle strips 40 and 41, which are removably secured to the jamb as shown. Mounted in the jamb there may be provided a clamping device or sash fast. Such a fast is indicated by 42. Its jaws 43 and 44 may be clamped against the flanges 25 through the holes 45 and 46 provided in the vertical faces 36 and 37. Each jamb provides suitable runways for sash weights indicated by 47. A separating strip 48 may be provided as shown. 49 indicates suitable pulleys over which the cords or chains, such as 50 may run. Removable sections may be provided in the jambs to give access to their interior. Such a section is indicated by 51.

In the embodiment of the invention illustrated the parting ridges 35 separate the sash a sufficient distance to permit of the provision of a suitable interlocking weather closure for the meeting rails 11 and 13 of the two sash. Secured to flange 25 of rail 13 is a bent metal hook-shaped strip 52, cooperating with a mating L-shaped bent metal strip 53 secured to the flat face 23 of rail 11. These strips when interlocked complete an S-shaped weather closure as shown.

The head 5 is similar to the jambs 2 and 3, but its parting ridge 54 is narrower than the ridges 25 so as to allow clearance for strip 52 of the lower sash, when said sash is raised. Angle strips 55 and 56 are preferably affixed to the head as shown, to close against the flanges 25 of the top rails when the sash is raised. The sill 4 comprises a bent metal shell open at the bottom and preferably filled with concrete indicated by 57. Its upper face has an exterior inclined portion or shed 58. An angle strip 60 is preferably

secured to ledge 59 to face against the flange 25 of the lower rail of sash 7. This flange may be provided with a depending weather strip 61 passing below ledge 59. The various members of the frame may be joined by any approved means, known to the art, as will be understood.

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

This invention comprises features which greatly cheapen window construction of the class described; work great economy in the maintenance of the completed structure; while, as well, the construction possesses the qualities of durability and efficiency.

Having thus described my invention, I claim:

1. In window construction, a sash comprising marginal pane seating rails; one or more of said rails being readily detachable and replaceable as an entirety.

2. In window construction, a sash comprising marginal pane seating rails and one or more intermediate muntins; one or more of said rails being readily detachable and replaceable as an entirety.

3. In window construction, a sash comprising top, bottom and side pane seating rails; said top rail being readily detachable and replaceable as an entirety.

4. In window construction, a sash comprising top, bottom and side pane seating rails and one or more intermediate muntins, said top rail being readily detachable and replaceable as an entirety.

5. In metallic window construction, a sash comprising bent metal pane seating rails; one or more of said rails being readily detachable and replaceable as an entirety.

6. In metallic window construction, a sash comprising bent metal pane seating rails and one or more intermediate metallic muntins; one or more of said rails being readily detachable and replaceable as an entirety.

7. In metallic window construction, a sash comprising bent metal pane seating rails; and means for detachably securing one of said rails to two adjacent rails.

8. In metallic window construction, a sash comprising hollow bent metal pane seating rails; and interiorly located means for detachably securing one of said rails to two adjacent rails.

9. In metallic window construction, a sash comprising hollow bent metal pane seating rails; and interiorly located means for detachably securing one of said rails to two adjacent rails, said means also serving as corner reinforcements for said sash.

10. In metallic window construction, a sash; said sash comprising a plurality of bent metal rails; each of said rails comprising an interior pane seat, a marginal weather flange and a molding shaped body portion.

11. In metallic window construction, a sash; said sash comprising a plurality of bent metal rails; each of said rails comprising an interior pane seat, a marginal weather flange and a molding shaped body portion; and reinforcing means located within said weather flange.

12. In metallic window construction, a sash; said sash comprising a plurality of bent metal rails; each of said rails comprising an interior pane seat, a marginal weather flange and a molding shaped body portion; and reinforcing means for the corners of said sash located within said weather flange.

13. In metallic window construction, a sash; said sash comprising a plurality of bent metal rails; each of said rails comprising an interior pane seat; a marginal weather flange and a molding shaped body portion; and reinforcing angle irons for the corners of said sash located within said weather flange.

14. In metallic window construction, a sash; said sash comprising a plurality of integral bent metal rails; each of said rails comprising an interior pane seat, a marginal weather flange and a molding shaped body portion.

15. In metallic window construction, a sash; said sash comprising a plurality of integral bent metal rails; each of said rails comprising an interior pane seat, a marginal weather flange and a molding shaped body portion; and reinforcing means located within said weather flange.

16. In metallic window construction, a sash; said sash comprising a plurality of integral bent metal rails; each of said rails comprising an interior pane seat, a marginal weather flange and a molding shaped body portion; and reinforcing means for the corners of said sash located within said weather flange.

17. In metallic window construction, a sash; said sash comprising a plurality of integral bent metal rails; each of said rails comprising an interior pane seat, a marginal weather flange and a molding shaped body portion; and reinforcing angle irons for the corners of said sash located within said weather flange.

18. In metallic window construction, a sash comprising bent metal rails, each rail being provided with a pane seat for embracing both faces of a pane; means for detachably securing one rail to the abutting rail, so that said rail may be readily removed as an entirety to permit the removal of the housing of a pane.

19. In metallic window construction, a

sash muntin comprising a bent metal molding with its edges intumed and alined, a longitudinal strip provided with medial spacing means projecting therefrom, and means engaging the intumed edges of said molding and securing said molding to said strip.

20. In metallic window construction, a sash muntin comprising a bent metal molding with its edges intumed and alined, and integral longitudinal metal strips with both edges bent on itself and then outwardly at right angles to form spacing means, and means engaging the intumed edges of said molding and securing said molding to said strip.

21. In metallic window construction, a bent metal sash provided with a grooved pane seat for embracing the margin of a pane; a muntin for said sash; said muntin comprising a bent molding with its edges intumed and leaving an opening therebetween, an exterior metallic strip provided with a

central longitudinal spacing abutment, and means engaging the intumed edges of said molding for securing said strip to said molding; said spacing abutment being extended longitudinally beyond the end of said strip and adapted to enter said groove pane seat of the sash and form securing means for said muntin.

22. In metallic window construction, a sash rail formed of a single strip of bent metal; said rail comprising a molding having a flat face, a flange projecting at a right angle at the edge of said flat face, and a groove pane seat substantially alined with and complementary to said flange.

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

ERNEST FLAGG.

Witnesses:

FREDERICK A. BLOUNT,
FRANK O'CONNOR.