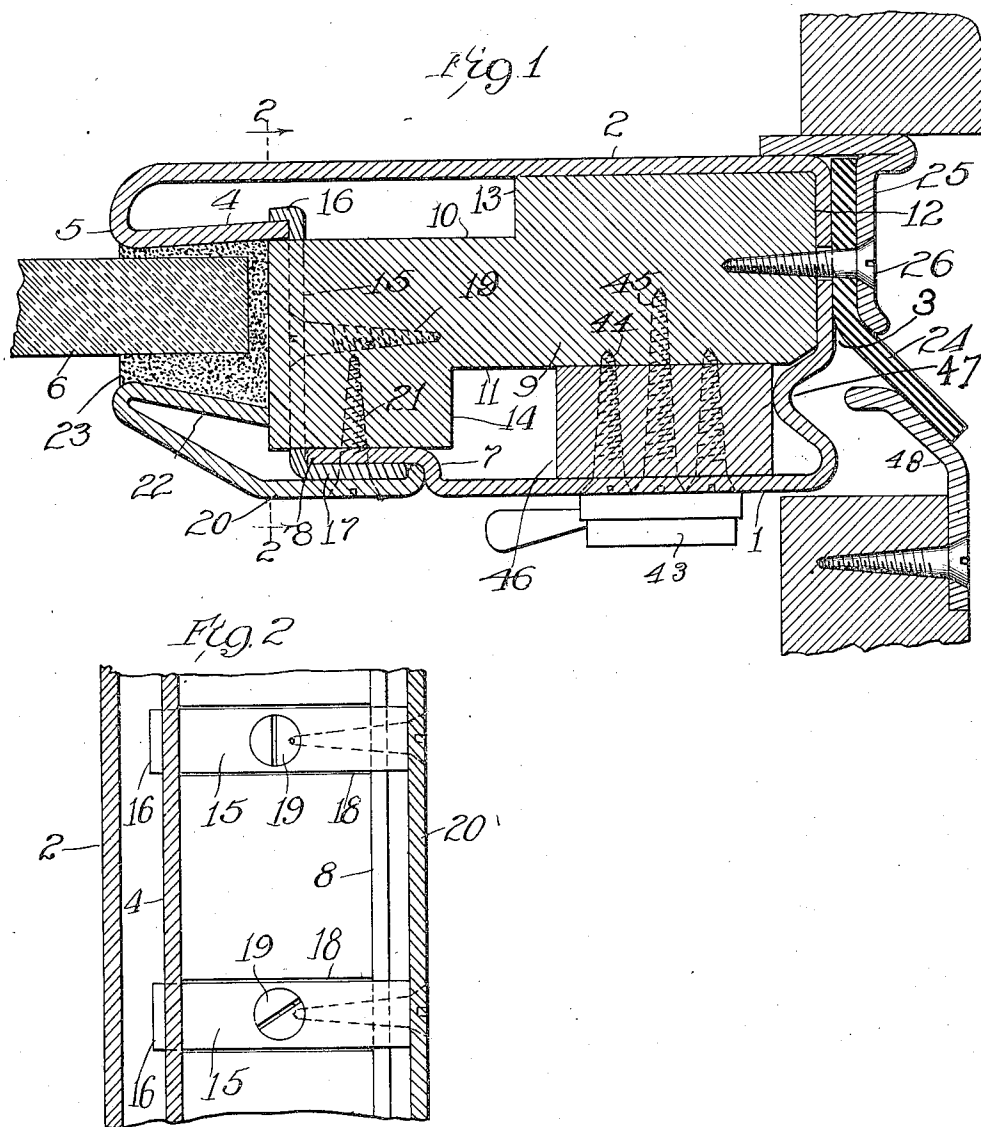


B. S. McCLELLAN.
METALLIC SASH.
APPLICATION FILED MAY 18, 1910.

1,045,580.

Patented Nov. 26, 1912.

2 SHEETS—SHEET 1.



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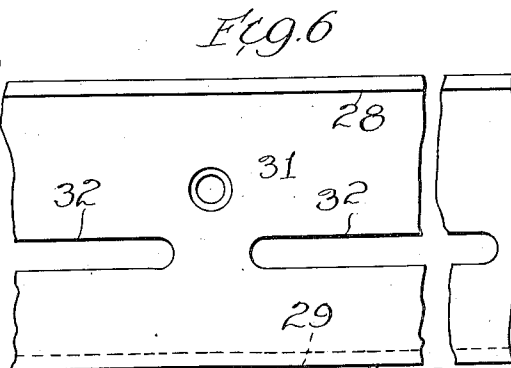
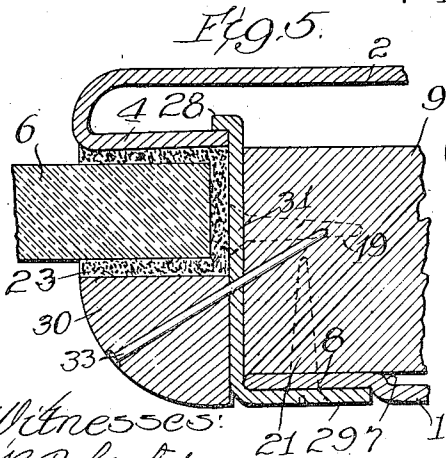
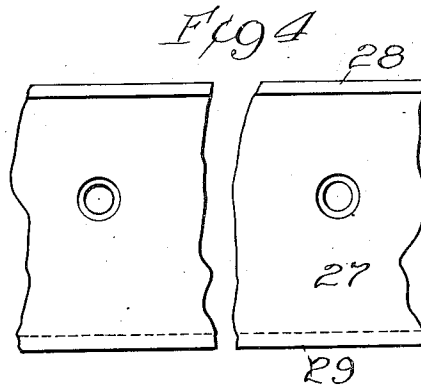
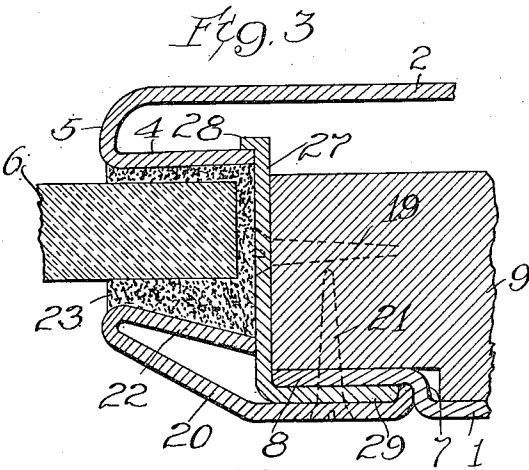
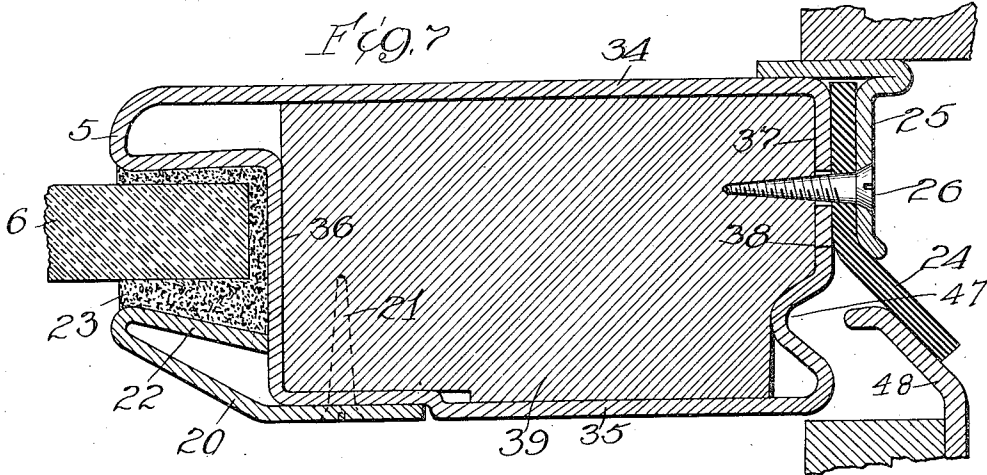
By W. W. Withenbury
Att'y.

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2 SHEETS-SHEET 2.



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UNITED STATES PATENT OFFICE.

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METALLIC SASH.

1,045,580.

Specification of Letters Patent.

Patented Nov. 26, 1912.

Application filed May 13, 1910. Serial No. 561,954.

To all whom it may concern:

Be it known that I, BENJAMIN S. MCLELLAN, a citizen of the United States, and residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Metallic Sash, of which the following is a complete specification.

The rails and stiles of metallic window sash as heretofore constructed have not afforded sufficient thermal resistance to prevent the rapid passage of heat and cold therethrough due to the difference in temperature between the inner and outer sides of the structure in which the sash is employed. This result is largely due to the fact that the metal of which the sash is constructed is usually of a light gage, and is a good heat conductor, and therefore in cold weather the cold readily passes through the walls of the sash rails and stiles and greatly affects the temperature of the compartment. Furthermore in metallic sash as heretofore constructed it has been customary to fasten the retaining beads for the glass by means of machine screws which pass into the inner edge of the rail or stile and engage in threaded apertures in metallic abutments secured within the sash for that purpose. With such constructions it often happens that the glass may vary in thickness, or the beads may not be exactly true, or the screw apertures in the abutments may be a little out of place, any of which inaccuracies will tend to throw the beads out of position and cause an uneven pressure on the glass, since the beads must assume the position caused by setting up or tightening the screws. It is this inability to adjust the beads to meet the individual requirements of the windows which is responsible for a large percentage of the breakage of glass where metallic sash are used.

The main objects of this invention are to provide a metallic sash with insulated rails and stiles adapted to retard the passage of heat and cold therethrough; to provide a metallic sash having stiles and rails filled with an insulating material capable of resisting the passage of heat and cold, and adapted to provide a solid foundation or abutment to which the side weather strips and the retaining beads may be secured or anchored in the desired position; to provide an insulated metallic sash so constructed

that the insulating material may be removed and replaced if desired without injury to the sash; and to provide a metallic sash with which either metal or wooden retaining beads for the glass may be employed.

Specific constructions of the invention are shown in the accompanying drawings, in which:

Figure 1 is an enlarged transverse section of one of the stiles of the sash, showing the insulator therein. Fig. 2 is a fragmentary section taken on line 2—2 of Fig. 1. Fig. 3 is a fragmentary section of the sash with the locking strip or plate extending the full length of the rail or stile. Fig. 4 is a fragmentary side elevation of the locking strip shown in Fig. 3. Fig. 5 is a fragmentary section of the sash with a wooden retaining bead for the glass. Fig. 6 is a fragmentary side elevation of the locking strip shown in Fig. 5. Fig. 7 is a horizontal section of a modified form of sash adapted to have the insulator inserted at the outer edge of the sash.

Referring first to Figs. 1 to 6, inclusive, one of the sash rails or stiles is shown which is constructed of a sheet of metal which is bent or folded longitudinally to form the integrally connected inner and outer side walls, and the outer edge wall, which are indicated respectively by 1, 2 and 3. The side walls 1 and 2 are approximately parallel with each other and are spaced a sufficient distance apart to give the desired thickness to the sash. The inner edge 4 of the wall 2 is bent inwardly toward the wall 1 and then rearwardly toward the wall 3 to provide the outer bead 5 which forms one side of the groove or channel for the glass 6. The side wall 1 is provided with an inwardly offset portion 7 near its inner edge, which forms a recess in the outer side of said wall intermediate the offset portion 7 and the edge. Said side wall 1 is of less width than the wall 2 and it terminates approximately even with the inturned edge 4 of the wall 2.

Within the recess or chamber formed by the walls 1, 2 and 3 is the insulator 9 of wood, fiber, or other suitable material. The insulator, as shown in Figs. 1, 3 and 5, is of a width to extend from near the edge of the glass 6 to the wall 3, and is provided in its outer and inner faces with grooves or recesses 10 and 11, the former of which is situ-

ated at the edge of the insulator adjacent to the glass and the latter of which is situated at the edge of the insulator adjacent to the wall 3. This construction permits the insulator to be inserted into the rail or stile or removed therefrom through the opening between said edges 4 and 8 since its thickness at either edge is no greater than the width of said opening. When inserting the insulator into the rail or stile, its edge 12 first enters the opening at the inner edge of the sash, and when the side 13 of the recess 10 has passed the edge 4 of the wall 2, the insulator is moved laterally to permit the side 14 of the recess 11 to pass the edge 8 of the wall 1. The recesses 10 and 11 also provide dead air spaces between the sides of the insulator and the walls 1 and 2.

The edges 4 and 8 of the side walls 1 and 2 may be secured together in any preferred manner, but as shown in Figs. 1 and 2, locking strips or plates 15 extend transversely of the inner edge of the insulator and each has flanges 16 and 17 which hook over the edges 4 and 8 respectively and prevent the side walls from spreading. Said strips, as shown, are countersunk in recesses 18 in the edge of the insulator and are secured thereto by wood screws 19 which extend through the strip and into the edge of the insulator.

A removable bead 20 is secured to the wall 1 and extends inwardly flush with the edge of the bead 5 to provide the other wall of the channel or recess for the glass. Said bead, as shown in Figs. 1 and 3, may be formed of a metal plate which has one edge seated on the flange 17 in the recess formed by the offset portion 7 in the wall 1, and wood screws 21 extend through said edge, and through the flange 17 and edge 8 of the wall 1, and into the insulator. The plate is bent slightly inwardly toward the bead 5, and the edge 22 is turned rearwardly toward the insulator and forms the other wall of the groove or channel for the glass. The positions of the edges 4 and 22 are such that the channel for the glass is somewhat wider at its back than at its front to prevent the putty 23 from working out past the glass, and when the bead is brought up to place by the screws 21 the edge 22 compresses the putty firmly against the glass but with an even pressure throughout the length of the bead.

The side weather strips 24 for the sash may be secured to the sash in the usual manner by means of an angle bar 25 and screws 26 which pass through one flange of the bar, the strip and the wall 3 and into the insulator. The insulator not only prevents the passage of heat and cold through the sash rails and stiles but it also provides a firm anchorage for the attaching screws for the beads and weather strips without necessitating placing the screws at predetermined

points as is necessary where machine screws are employed with abutments to receive the screws.

If preferred, one continuous locking plate 27 may be employed, as shown in Figs. 3 and 4, which plate extends the full length of the rail or stile and has oppositely directed flanges 28 and 29 thereon which engage the edges 4 and 8, as described with reference to the plate 15.

With either of the constructions shown in Figs. 1 and 3 a removable wooden retaining bead may be used instead of the removable metallic bead 20. When used with a continuous locking plate, as shown in Figs. 5 and 6, the plate 31 is provided with longitudinal slots or apertures 32 through which the nails 33 or other fastening means for the bead may enter the insulator.

If preferred, the sash rails and stiles may have their outer walls 34, inner walls 35, inner edge wall 36 and outer edge wall 37 formed from a single piece of sheet metal as shown in Fig. 7. In that case the edges of the metal meet to form the outer edge walls 37 of the sash and are welded together at 38. Before said edges of the sheet are turned in, however, the insulator 39 is inserted from the outer edge of the sash and then the edges of the metal are folded in and secured together, thus incasing the insulator within the rail or stile. Either metallic or wooden beads may be employed with this form of sash, and when wooden beads are employed the inner edge of the sash is apertured the same as the plate shown in Fig. 6.

As shown in Fig. 1 of the drawings, I have provided a sash lock 43 which is placed directly against the side wall 1 of the sash and is secured in place by means of screws 44 and 45, which extend through the said side wall 1 and through the wooden abutment block 46 and into the insulator. When a solid insulator is employed, as shown in Fig. 7, the abutment block 46 is omitted.

The walls 3 of the stiles preferably have a longitudinal groove 47 therein to prevent the sash contacting with the bearing plate 48 for the weather strip 24.

The operation of the device is as follows: When the insulators are inserted in the sash rails and stiles they not only retard the passage of heat and cold through the walls of the sash but also add greatly to the rigidity of the sash. Furthermore the insulators provide a firm anchorage for the attaching screws for the removable beads and the side weather strips and obviate the necessity for punching the screw apertures in the walls of the sash as accurately as is required when metallic abutment blocks are employed in which to secure the screws.

When the glass has been placed in the sash with its edges embedded in putty, the re-

movable beads, whether metallic or wooden, have their fastening means secured directly to the insulator, and the beads may be drawn up to place without causing undue stress on the glass.

It is immaterial whether the rails and stiles be so constructed that they open at their inner or outer edges. In either case the joint is effectually sealed and the side walls are held in close contact with the insulator.

Obviously a metallic sash constructed in accordance with this invention will effectually prevent the passage of heat or cold through its rails and stiles and will have all of the advantages of the ordinary wooden sash without being inflammable. Obviously also many details of the construction shown may be varied or omitted without departing from the spirit of the invention.

I claim:

1. A metallic sash, comprising hollow sash rails and stiles open at their inner edges, an insulator adapted to be inserted through said opening and incased in said rails and stiles, and locking plates adapted to engage the edges of the openings in the rails and stiles and hold the walls of the rails and stiles against the insulator.

2. A metallic sash, comprising hollow rails and stiles each open along the inner edge, an insulator in each rail and stile, adapted to be inserted and removed through said

opening and prevent the passage of heat and cold through the walls of the sash, and a locking plate extending the full length of each opening and adapted to be secured to the edges of the openings.

3. A metallic sash, comprising hollow sash rails and stiles open along one edge, an insulator incased in each rail and stile, a locking plate adapted to close the opening in each rail and stile and having slots therein, wooden retaining beads and fastening means therefor adapted to extend through said slots and into the insulator.

4. A metallic sash, comprising top, bottom and side members each having an inwardly offset portion in one side near its inner edge, members having one edge lying in said offset portions in the plane of said side and turned inwardly beyond the edges of said top, bottom and side members toward the opposite side of the sash, and insulators secured in said top, bottom and side members and affording an anchorage for the securing means for the members in the offset portions.

In witness whereof I have hereunto subscribed my name in the presence of two witnesses.

BENJAMIN S. McCLELLAN.

Witnesses:

W. W. WITHEBURY,
JOHN CORWIN.