E. M. MATTHEWS.

WINDOW SASH.

APPLICATION FILED MAR. 2, 1910.

962,647.

Patented June 28, 1910.

3 SHEETS—SHEET 1.

Fig. 2.

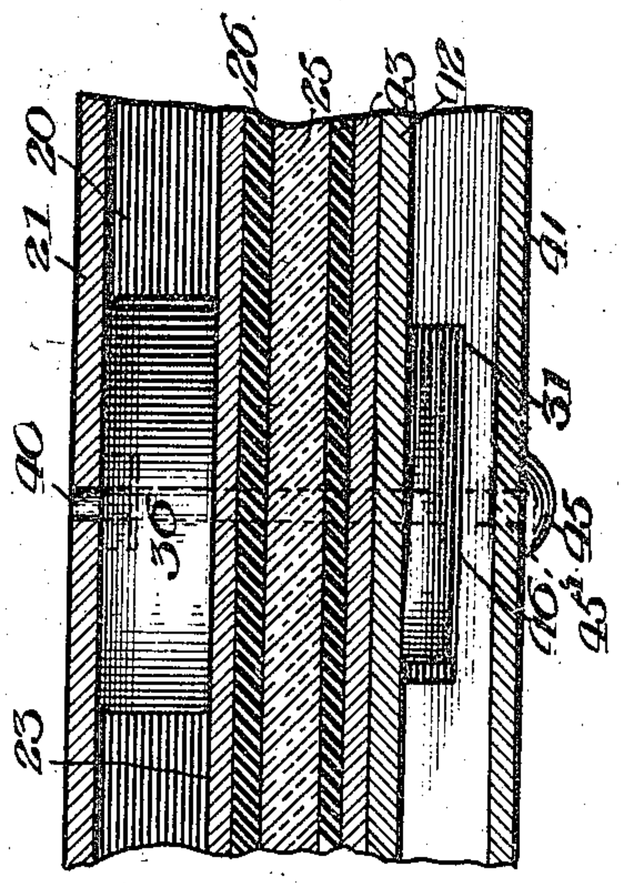
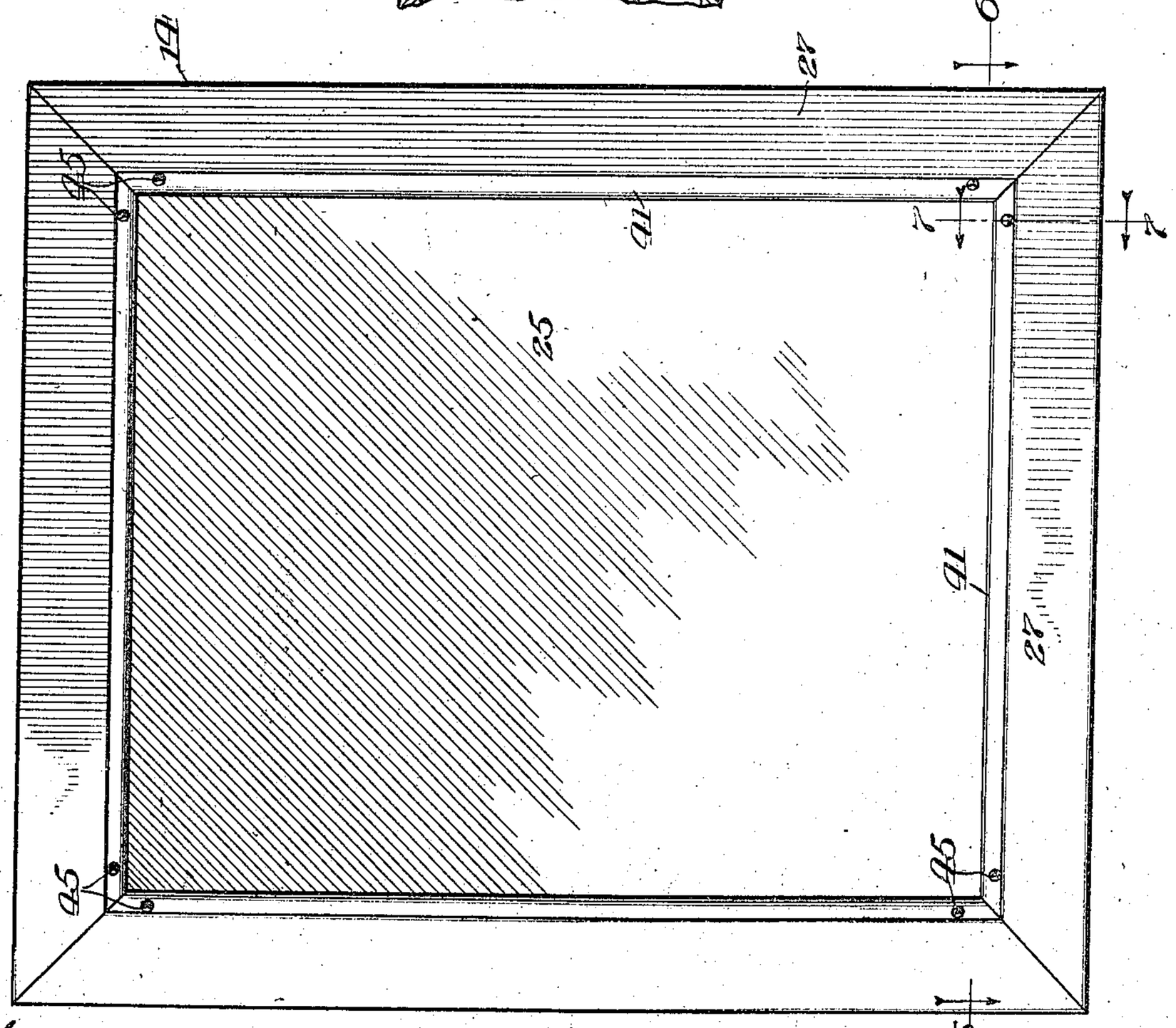


Fig. 1.



Witnesses.
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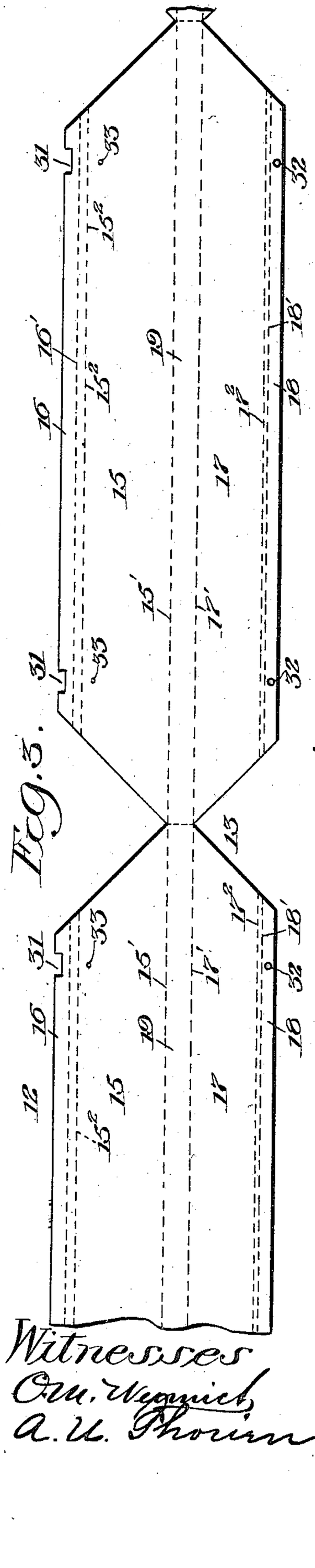


Fig. 3.

Fig. 4.

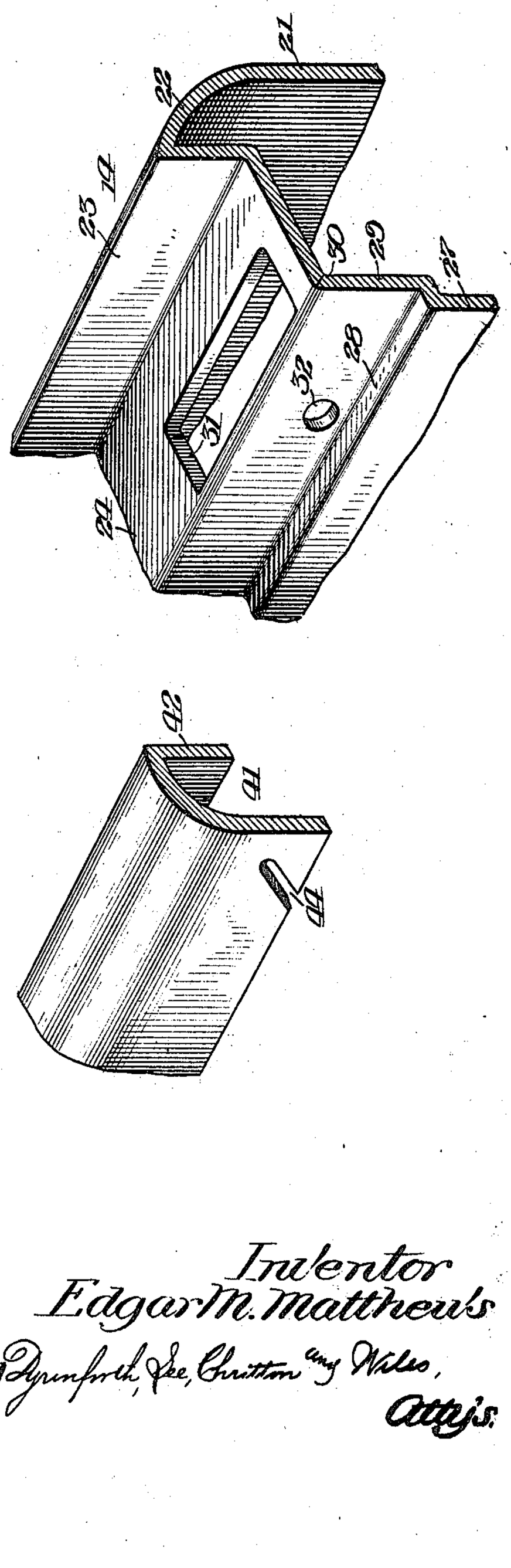
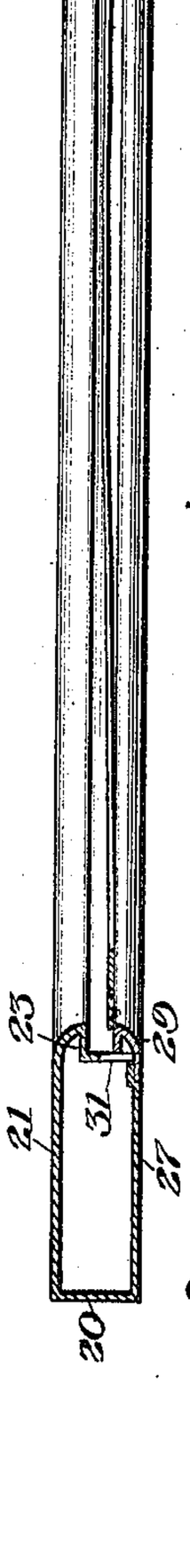


Fig. 5.

Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 8.

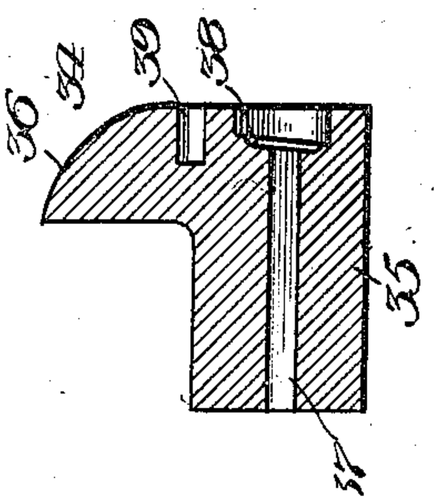


Fig. 10.

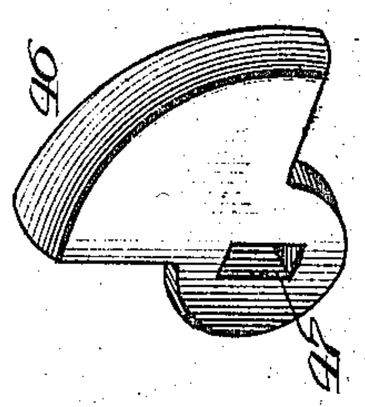


Fig. 9.

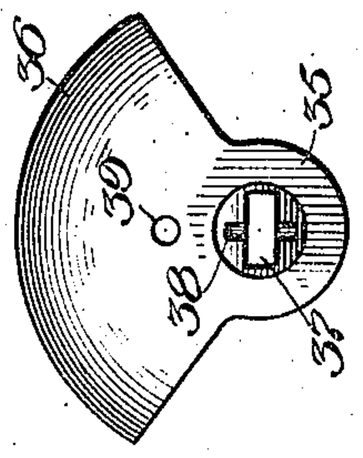
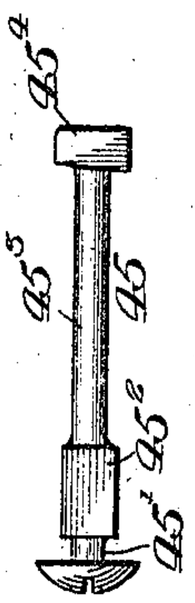


Fig. 11.



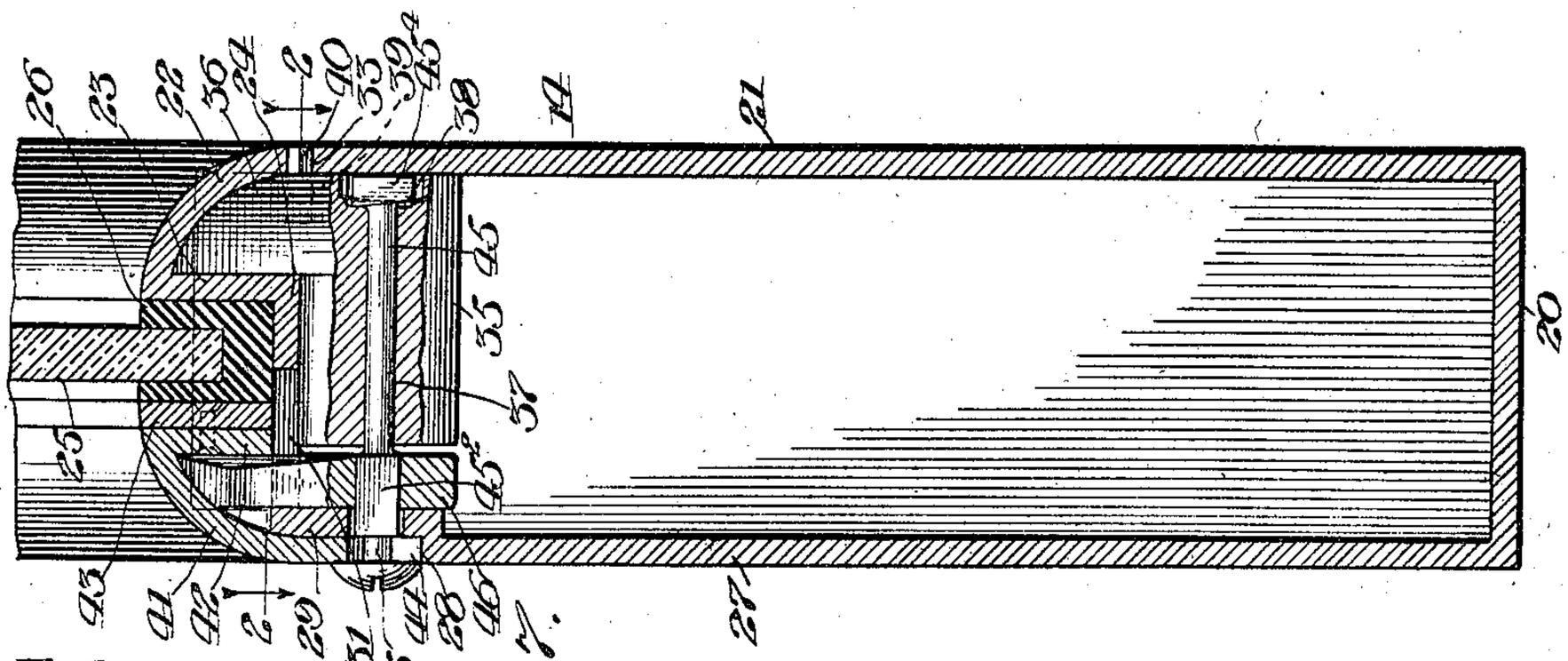


Fig. 7.

Witnesses

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UNITED STATES PATENT OFFICE.

EDGAR M. MATTHEWS, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO W. E. ROTHERMEL, OF CHICAGO, ILLINOIS.

WINDOW-SASH.

962,647. Specification of Letters Patent. Patented June 28, 1910.

Application filed March 2, 1910. Serial No. 546,883.

To all whom it may concern:

Be it known that I, EDGAR M. MATTHEWS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Window-Sash, of which the following is a specification.

The primary object of my invention is to provide a construction of window-sash whereby the pane of glass which it is designed to hold may be readily introduced into and secured in it, and a broken pane may be removed from it, without requiring the sash to be removed from the window.

While my invention may be used in window-sash generally, I have devised it more especially for sheet-metal sash and particularly for use in the windows of railway cars, which is the form thereof illustrated in the accompanying drawings, in which—

Figure 1 shows my improved sash by a view in front elevation; Fig. 2 is an enlarged section on the irregular line 2—2, Fig. 7; Fig. 3 is a broken plan view of the sheet-metal blank from which the sash-frame is formed; Fig. 4 is an enlarged broken perspective view of a section of one of the sash-rails formed out of the blank; Fig. 5 is a similar view of a section of one of the removable sheet-metal beads which coöperate with the sash-rails for holding the pane in place; Fig. 6 is an enlarged section on line 6—6, Fig. 1; Fig. 7 is an enlarged section on line 7—7, Fig. 1; Fig. 8 is a view in sectional elevation of a headed clamping-block detail, and Fig. 9 is a face view of the same; Fig. 10 is a perspective view of a clamping-cam detail, and Fig. 11 is a view in side elevation of the bolt-like key for separably fastening together the parts which clamp the pane in the sash-frame.

The blank 12 (Fig. 3) is a continuous sheet-metal strip of generally-rectangular cross-section with coincident V-shaped notches, one pair of which is shown at 13 in its opposite edges, and the ends being similarly beveled. These notches define the blank-sections, all of which are alike for an equilateral rectangular sash such as that shown in Fig. 1, but may otherwise vary in length. To form the four rails of a sash 14 the blank-sections are bent at their junctions between the notches to extend at right-angles to each other and, preliminary thereto, are each bent along the broken lines shown on the blank. Thus the relatively wider and narrower sides 15 and 17 are bent along the lines 15^1 and 17^1 to extend parallel with each other and form of the part 19 between the bending-lines the marginal face 20 (Fig. 7) or base of the rail. Each side 15, which forms the outer face 21 of the respective rail, is then curved along the line 15^2 to form the crown 22 and the part 16 of the blank-section is bent inwardly to extend parallel with the face 21 and form the inner wall 23 of the crown, and again at right-angles to the wall 23 to form a seat 24 for the window-pane 25 in its trough-like cushion 26 of soft-rubber or other suitable material for cushioning the glass against fracture from shock, jar and the like.

The bending of the blank-sections first-described as forming of each the face 20, produces of the part 17 the inner face 27 of the respective sash-rail, which is bent along the line 17^2 on the blank to extend at a right-angle to the face 27 and form the shoulder 28, leaving the part 18 of each blank-section to form, by bending along the line 18^1, the offset wall 29, which is united along its edge, as by brazing or welding, to the opposing edge of the seat 24, the line of junction being indicated at 30 in Fig. 4; and the interfitting-corner-forming beveled ends of the rails should be united in the same way to complete the sash-frame. In the edge of the wider part 15 of each blank-section near its ends are formed similar recesses 31, and in direct alinement with each recess is provided in the part 17 of each blank-section a circular opening 32; and circular openings 33 are formed in the parts 15 of the blank-sections, in alinement with the recesses 31, to provide pin-holes (Fig. 7) for the purpose hereinafter explained.

Prior to uniting the edges of the rails along the line 30 a clamping-block 34 (Figs. 8 and 9) is introduced into place, one in each end of each rail. This block comprises a stem 35 provided on one end with a curved head 36 conforming to and fitting within the crown 22, the stem containing a longitudinal bore 37 of rectangular cross-section terminating at its outer end in a socket 38 having an inclined inner wall to exert the cam-function hereinafter described. In placing the blocks 34 in the respective rails, each is caused to register a pin-socket 39

provided in its back near the bore of the head 36 with a hole 33 to permit a pin 40 to be driven through the hole into the socket for permanently securing the block in position.

A sheet-metal bead 41, conforming in shape and dimensions to those of the curved and inner-wall portions of the crown 22, seats on the shoulder 28 against the wall 29 of each rail, with its vertical-wall portion 42 bearing against a leaf-spring 43 (which may be fastened to that wall) interposed between it and the adjacent side of the cushion 26; and this bead contains, near each end of its edge-portion, an inclined slot like that shown at 44 in Fig. 5. Before applying a bead to the sash, a key 45 is inserted through each opening 32 and the stem 35 of the clamping-block 34 registering therewith, and through a rectangular opening 47 in the hub of a cam 46 previously inserted into place for the purpose through a recess 31. The bolt or key, shown to be provided on one end with a slotted head like that of a screw, has its stem formed, adjacent to that head, with a narrow cylindrical section 45^1 of a diameter adapting a bead-slot 44 to straddle it, a wider section 45^2 of rectangular cross-section to fit the opening 47 in the cam 46, a cylindrical section 45^3 of the diameter of the section 45^1 and of that of the rectangular bore through the stem 35 of the clamping-head 34; and the key-stem terminates at its opposite end in a cam-head 45^4 of rectangular cross-section adapting it to be passed through the stem-bore 37 for introduction into the socket 38 to engage therein with the cam-faced wall of the latter. When a bead 41 is finally applied, it is placed over the respective cams 46 in a manner to cause its slots 44 to straddle the respective keys 45 at their sections 45^1.

The sash-frame being formed, with the beads and other parts in place, all as described, and a window-pane 25 in its cushion 26 seating against the parts 24 of the rails, by turning the keys 45, as through the medium of a screw-driver, in the direction to engage the cam-head 45^4 with the wall of the socket 38 and the cam 46 with the adjacent surface of the bead-wall 42, the resultant cam-action firmly clamps the parts together, compressing the springs 43 and cushions 26 and holding them and the window-pane tightly against rattling, besides rendering the sash air-tight and waterproof. To free the glass, as for removing it when broken to permit a new pane to be introduced into the sash, the keys 45 are turned in the opposite direction to disengage their heads 45^4 from the respective socket-walls, thereby freeing the beads sufficiently, (in which the recoil of the springs 43 assists) to permit withdrawing them from the keys, when the glass becomes accessible for removing it and the sash is in condition to permit the insertion of a new window-pane, and to have the parts again tightened by turning the keys as first-described.

As will be seen, my invention on a window-sash enables the operation of inserting a pane, or that of removing one that is broken and replacing it with a new one, to be performed without requiring the sash to be removed from the window-frame and with great facility, and also expeditiously since it enables a workman to perform the work in a few minutes because of the ready removal of which the heads are susceptible, requiring the use of a mere screw-driver as the only tool for the purpose and its application to the screw-heads of the keys, of which latter two are provided at each corner of the sash, as shown in Fig. 1.

What I claim as new and desire to secure by Letters Patent is—

1. In a window-sash, the combination of a frame comprising rails provided with window-pane seats, beads coöperating with said seats to confine the pane, and key-operated clamping-means coöperating with the beads to releasably secure them in place with the operating key extending for access through the face of the sash, for the purpose set forth.

2. In a window-sash, the combination of a frame comprising rails provided with window-pane seats, spring-pressed beads cooperating with said seats to confine the pane, and key-operated clamping-means coöperating with the beads to releasably secure them in place with the operating key extending for access through the face of the sash, for the purpose set forth.

3. In a window-sash, the combination of a frame comprising rails provided with window-pane seats, trough-shaped cushions on said seats for confining said pane about its edges, spring-pressed beads coöperating with said seats and cushions to confine the pane, and key-operated clamping-means coöperating with the beads to releasably secure them in place, for the purpose set forth.

4. In a window-sash, the combination of a frame comprising rails provided with window-pane seats, beads coöperating with said seats to confine the pane, cam-pressed clamping-means on the frame coöperating with the beads to confine the pane, and cam-headed keys engaging said clamping-means to releasably secure the beads in place and extending through the front face of the sash, for the purpose set forth.

5. In a window-sash, the combination of a frame comprising hollow rails provided with window-pane seats, hollow beads coöperating with said seats to confine the pane, clamping-blocks in the frame each having a key-bore in its stem, cams in the frame ex-

tending into and engaging the beads, and cam-headed keys extending through the beads, cam-heads and clamping-blocks to engage their heads with said blocks and to tighten said cams against the beads and thereby releasably secure the beads in place, for the purpose set forth.

6. In a window-sash, the combination of a frame comprising hollow rails provided with window-pane seats, hollow beads coöperating with said seats to confine the pane, clamping-blocks in the frame having heads engaging one side of said seats and stems containing longitudinal key-bores, cams in the frame extending into and engaging the beads to confine them against the opposite sides of said seats, and cam-headed keys having cylindrical sections with which the beads removably engage, angular sections engaging the cams, and sections extending through said bores, with the cam-heads thereon engaging the blocks at the ends of the bores therein, for the purpose set forth.

7. In a window-sash, the combination of a frame comprising hollow rails provided with window-pane seats, hollow beads cooperating with said seats to confine the pane, clamping-blocks in the frame having heads engaging one side of said seats and stems containing longitudinal key-bores of angular cross-section terminating in sockets, cams in the frame extending into and engaging the beads to confine them against the opposite sides of said seats, and keys having heads on one end, cylindrical sections with which the beads removably engage, angular sections carrying the cams and cylindrical sections extending through and rotatable in said bores with cam-heads on their ends working in said sockets, for the purpose set forth.

8. In a window-sash, the combination of a sheet-metal frame comprising hollow rails each formed with a recessed window-pane seat and a shouldered wall joined to said seat, hollow sheet-metal beads coöperating with said seats to confine the pane, and key-operated clamping-means in the rails and beads for releasably securing the beads in place, for the purpose set forth.

9. In a window-sash, the combination of a sheet-metal frame comprising hollow rails each formed with a crown on one side and a recessed window-pane seat adjacent thereto and a shouldered wall-section on its opposite side joined to said seat, crown-shaped hollow sheet-metal beads removably supported on said seats and provided with slots, clamping-blocks in the rails having crown-shaped heads fitting said crowns and stems containing longitudinal key-bores, cams in the rails extending through the seat-recesses into and engaging the beads to confine them against said seats, and cam-headed keys extending rotatably through said wall-sections and provided with cylindrical sections straddled by the bead-slots, angular sections carrying said cams and sections extending through said bores, with cam-heads on the key-ends engaging the blocks at the ends of said bores therein, for the purpose set forth.

EDGAR M. MATTHEWS.

In presence of—
A. U. THORIEN,
R. A. SCHAEFER.