May 5, 1936. J. KAHN ET AL 2,040,049

SOUND EXCLUDING WINDOW

Filed April 18, 1933 5 Sheets-Sheet 1

Fig. 1.

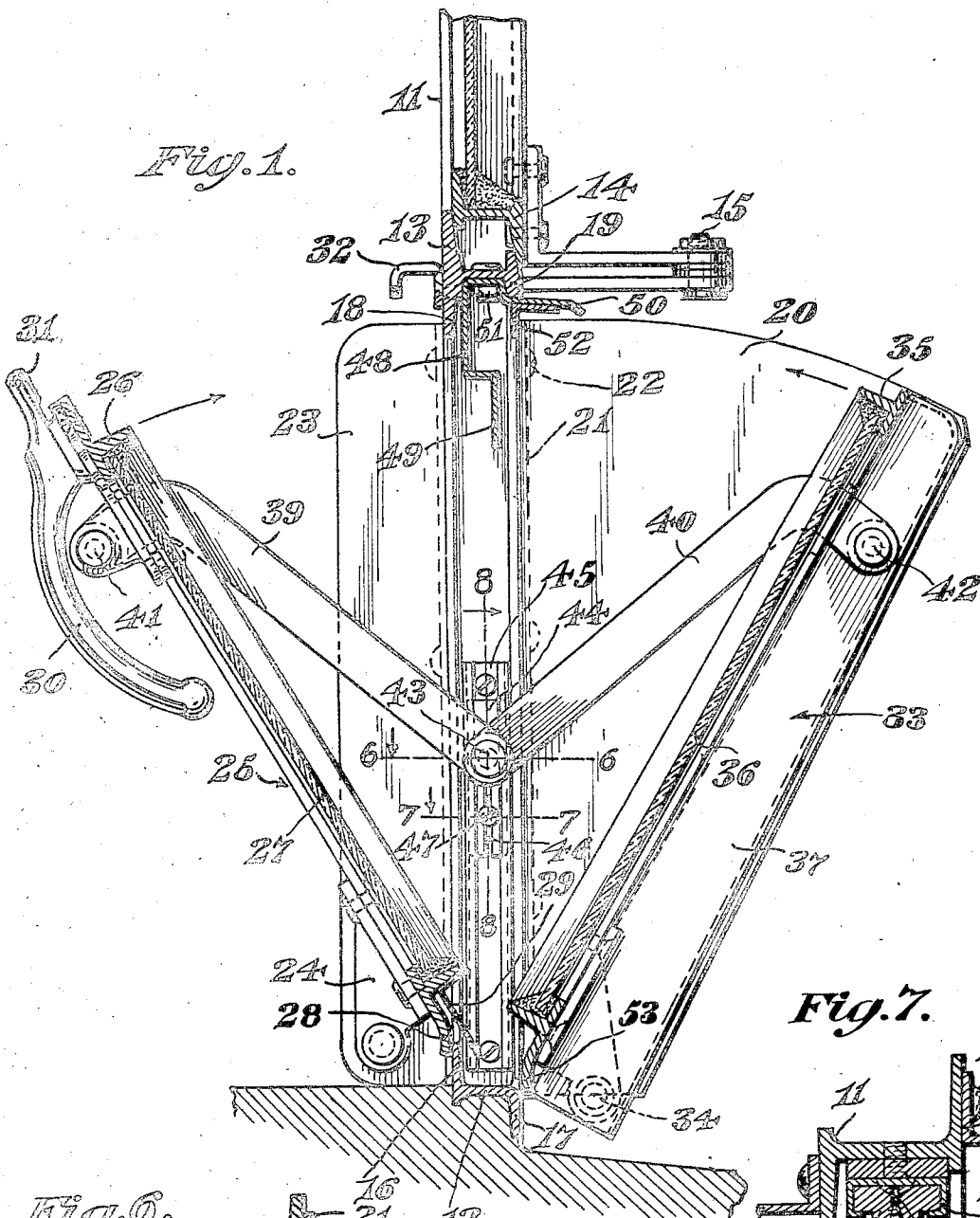
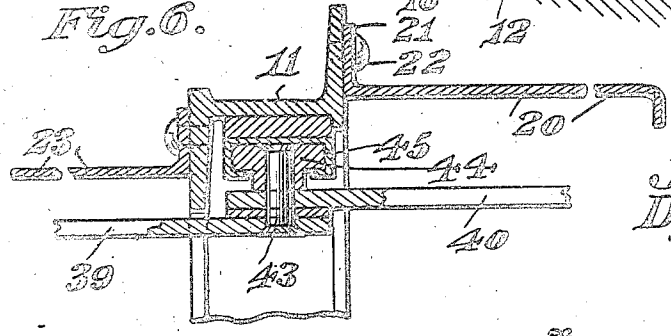


Fig. 7.

Fig. 6.



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SOUND EXCLUDING WINDOW

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Fig. 2.

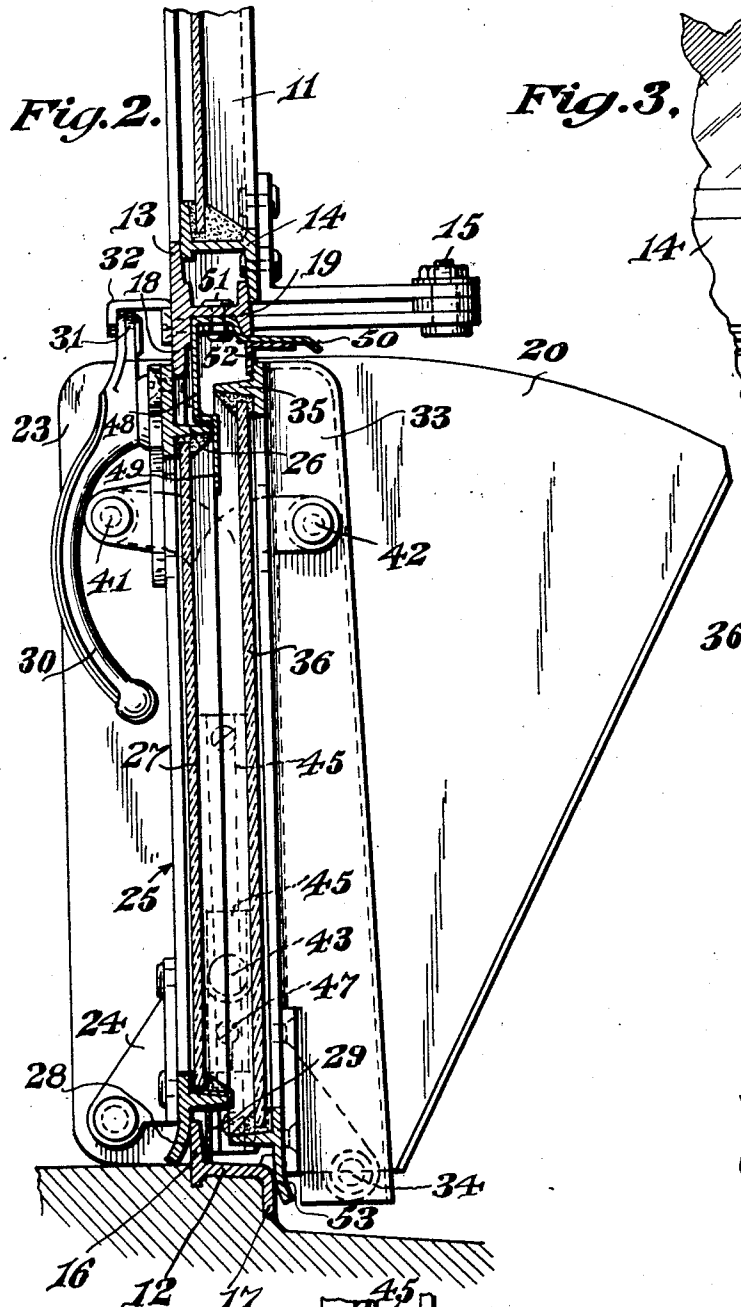


Fig. 3.

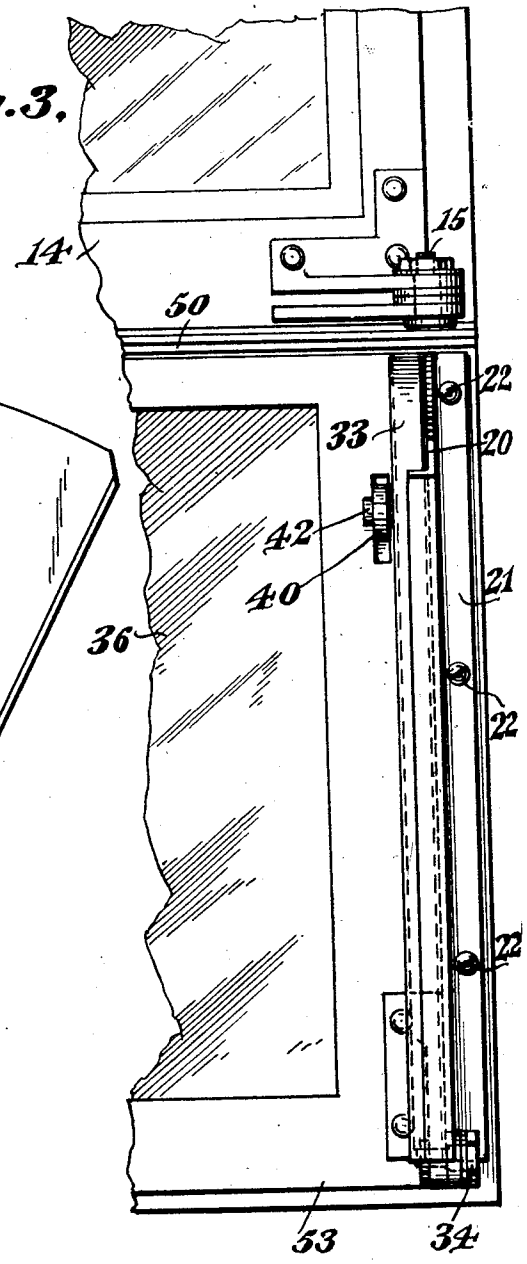
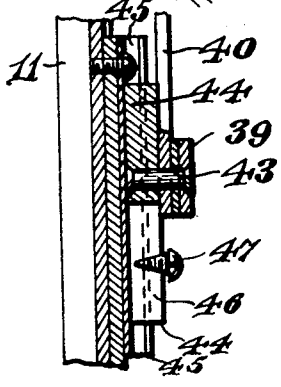


Fig. 8.



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SOUND EXCLUDING WINDOW

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Fig. 4.

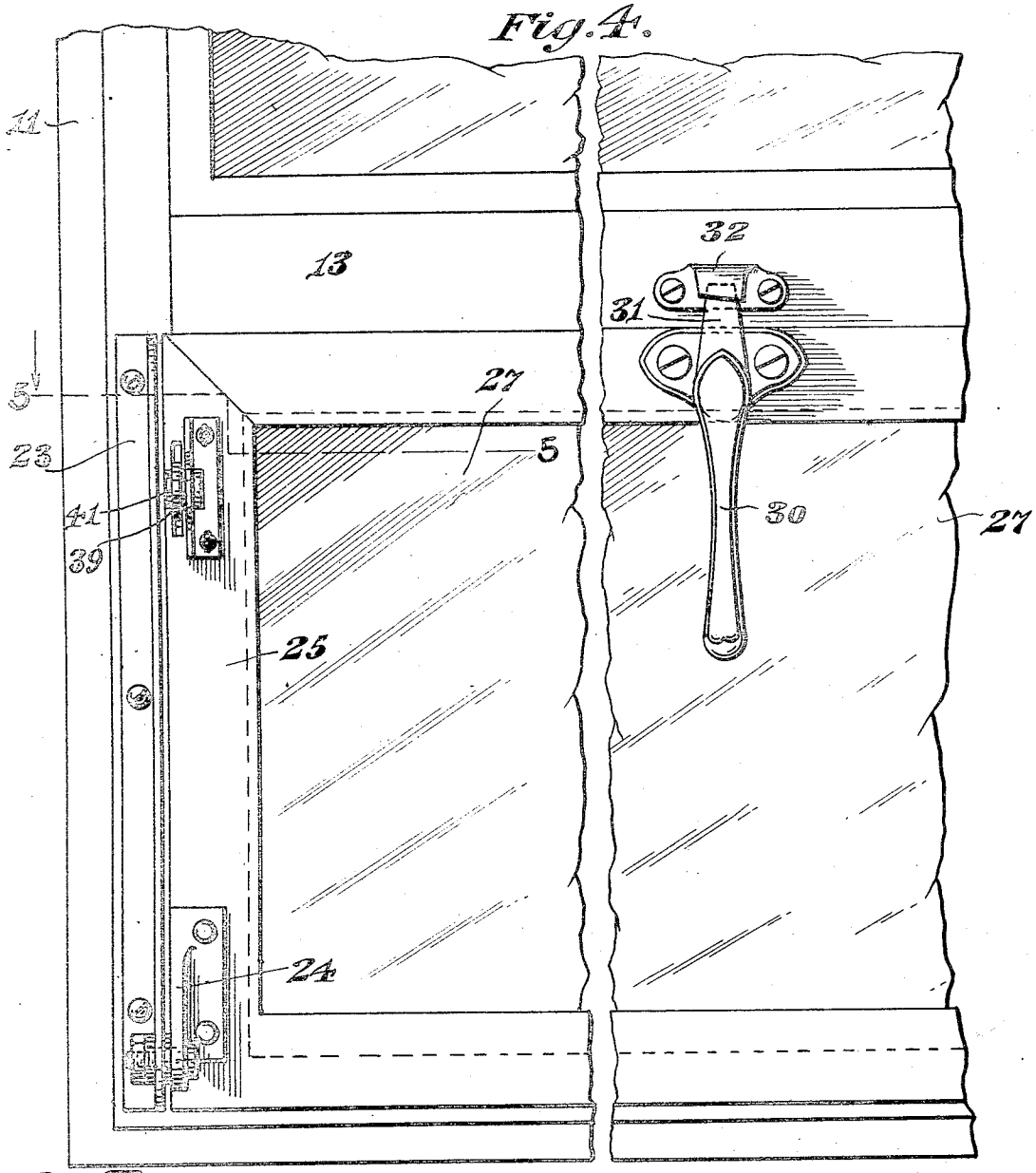
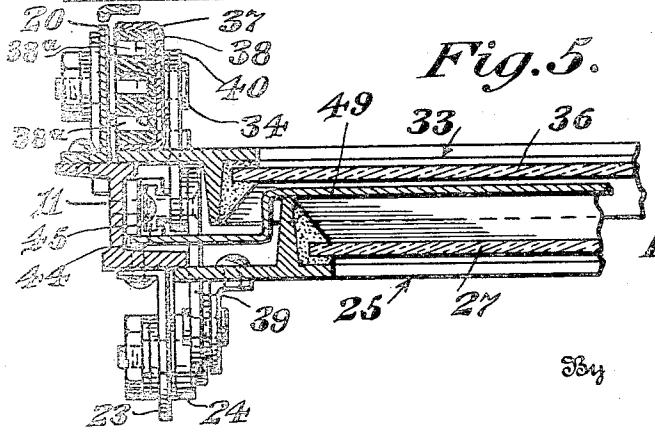


Fig. 5.



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Fig. 9.

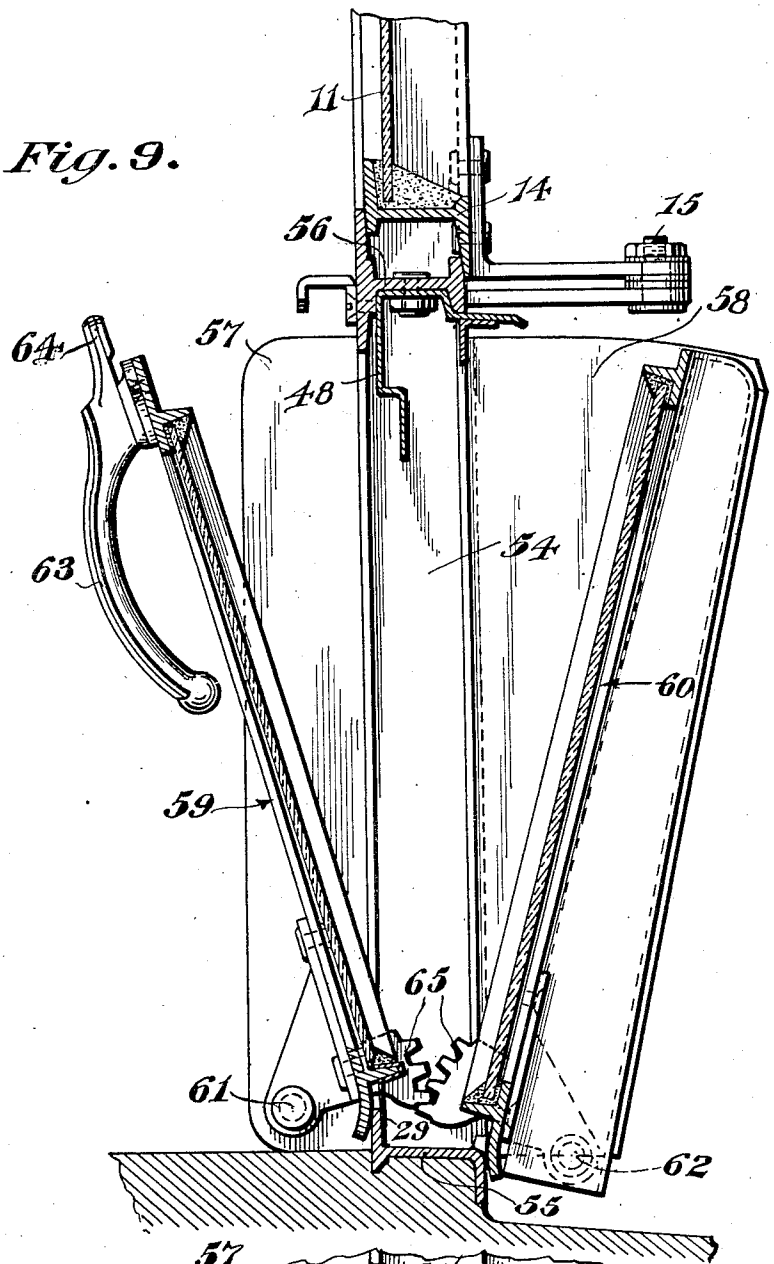
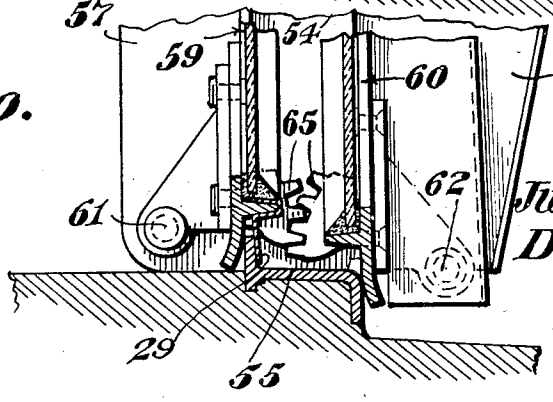


Fig. 10.



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Fig. 11.

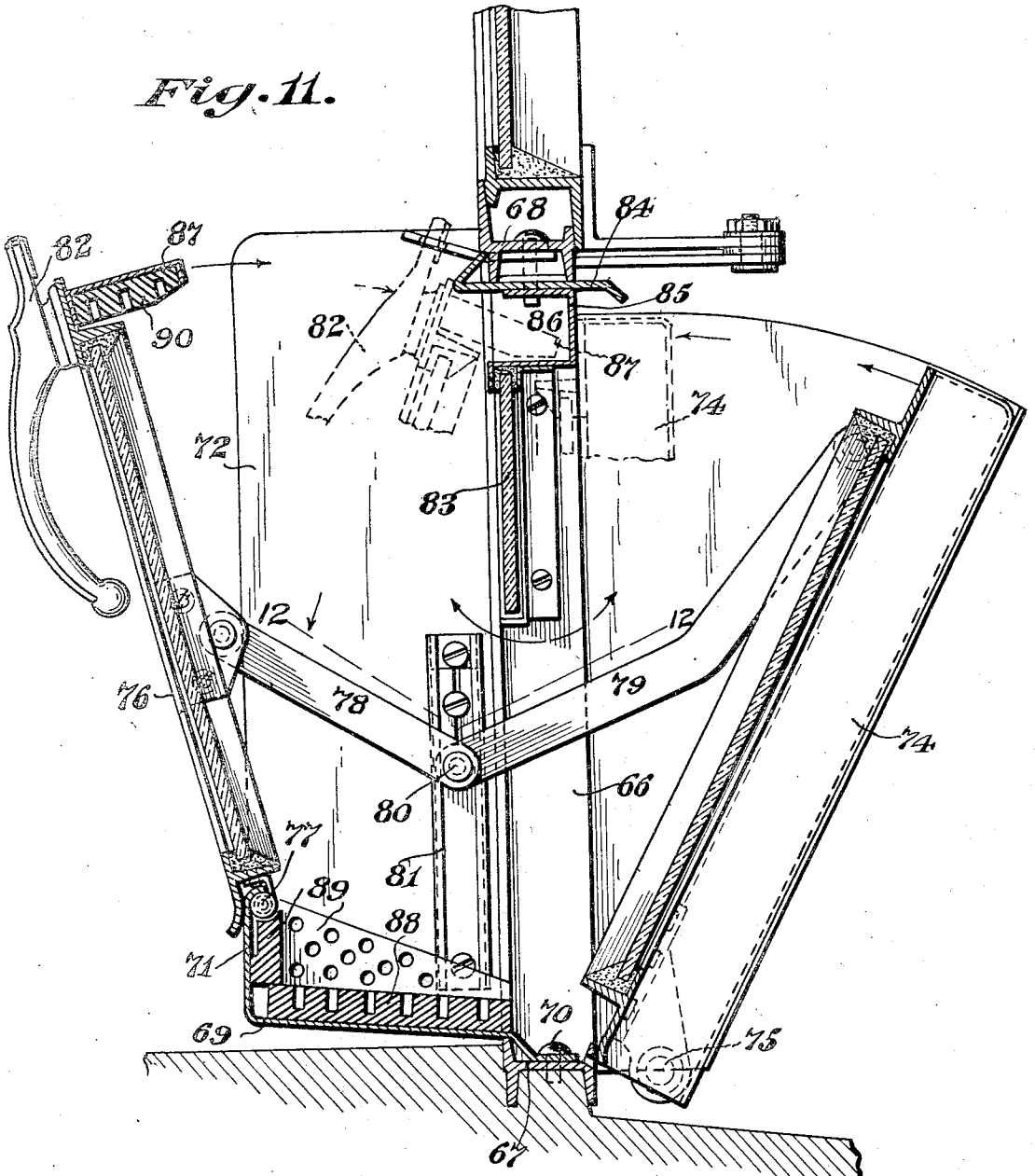
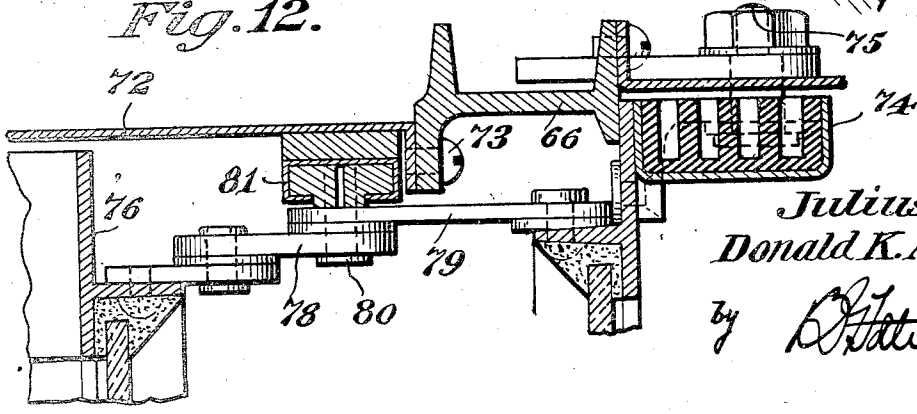


Fig. 12.



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Patented May 5, 1936 2,040,049

UNITED STATES PATENT OFFICE

2,040,049

SOUND EXCLUDING WINDOW

Julius Kahn and Donald K. Macleod, Youngstown, Ohio, assignors to Truscon Steel Company, Youngstown, Ohio, a corporation of Michigan

Application April 18, 1933, Serial No. 666,744

6 Claims. (Cl. 98—88)

It is well recognized that the opening of windows for the purpose of ventilation permits entrance of outside noises and where these windows face on busy city streets, particularly where there are street cars, the noise admitted is not only in itself objectionable, but greatly interferes with the activities being performed within.

It has been proposed to use air deflectors in the window openings, but these deflectors do not materially interfere with the entrance of sound. On the other hand they often augment the same.

It has been proposed to employ ventilators having sound deflecting or absorbing means, or both, located therein. These in great measure have been cumbersome in character, intricate in design, and therefore expensive to manufacture and install. More than that they occupy considerable room in the window openings or vents, both when in use and when closed.

One of the objects of the present invention is to provide a window structure with ventilating means of a sound excluding character made as a part of a window unit, the same being simple in structure, readily installed, easily operated, highly effective as a silencing device, while constituting an excellent ventilator, and one which occupies very little space both within and without the room when in its closed or inoperative condition. Certain of its features moreover are adaptable for employment in ventilator structures that can be attached or applied to windows already in use.

Two embodiments of the invention that are at present considered preferable, are illustrated in the accompanying drawings, wherein:—

Figure 1 is a vertical sectional view through the lower portion of the window structure, showing the sound muffling ventilator in place and in open or operative position.

Figure 2 is a similar view showing the device closed.

Figure 3 is an outside elevation of one end of the structure.

Figure 4 is an inside elevation of the same.

Figure 5 is a detail sectional view on the line 5—5 of Figure 4.

Figures 6 and 7 are detail sectional views taken respectively on the lines 6—6 and 7—7 of Figure 1.

Figure 8 is a vertical sectional view on the line 8—8 of Figure 1.

Figure 9 is a vertical sectional view through a slightly modified form of construction with the ventilator open.

Figure 10 is a similar view of the lower portion of the same with the ventilator closed.

Figure 11 is a vertical sectional view through another modification.

Figure 12 is a detail cross sectional view on the line 12—12 of Figure 11 and showing the baffle members in their closed position.

Referring first to the embodiment disclosed in Figures 1–8 inclusive, a portion of a window frame is shown which includes vertical side bars 11, a bottom cross bar 12, and an intermediate cross bar 13. The cross bar 13 may be said to constitute the bottom of the window vent opening. This opening in the present instance is closed by an outwardly swinging sash, a portion of which is shown at 14, the lower hinge thereof being illustrated at 15. The structure, however, being well-known and being open to wide modification, no further description thereof is believed to be necessary.

The space or opening between the cross bars 12 and 13 is employed for ventilating purposes, and in this connection it will be noted that the cross bar 12 has on its inner side an upstanding flange 16 and on its outer side has a depending flange 17. The cross bar 13 is provided on its inner side with a depending flange 18, and on its outer side with a depending flange 19 of less width than the flange 18. Secured to the outer sides of the vertical bars 11 between the cross bars 12 and 13, are outstanding wing plates 20. Preferably these wing plates have offset flanges 21 secured by screws 22 or other suitable fasteners. Likewise on the inner sides of the bars 11 and between the bars 12 and 13 are vertical wing plates 23. These wing plates 23 are preferably narrower than the wing plates 20 and said wing plates 20 taper toward their lower ends.

Pivoted to the lower ends of the wing plates 23 are brackets 24 which carry a swinging inwardly opening baffle member, designated generally by the reference numeral 25. The baffle member consists of an angular metal frame 26 in which is fitted a glass plate 27. The frame is provided along its lower bar with a depending curved flange 28 that rides along the inner flange 16 of the cross bar 12, and a resilient weather strip 29 preferably depends from the baffle member frame and bears against the outer side of the flange 16 when the baffle member 25 is in its vertical or closed position, as shown in Figure 2. In order to hold the baffle member 25 in said closed position a combined operating handle and latch 30 is pivoted upon the upper frame bar of the baffle member, the latch portion 31 engaging behind a keeper hook 32 projecting inwardly from the upper window frame bar 13.

An outwardly opening baffle member 33 is likewise pivoted at its lower end, as indicated at 34, to the lower end of the frame bar through the medium of the wings 20. This baffle member also consists of an angular frame 35 in which is set a glass plate 36. The frame 35 preferably has secured to its ends channel bars 37 (see Figure 5), which hold suitable sound absorbing material 38 that is spaced from the inner faces of the wing plates 20 and serves to prevent noise leakage past the same. It will be noted that the material 38 is spaced from the plates 20, thereby avoiding mechanical contact and rubbing and the hazard of freezing. Preferably the material 38 is of fibrous cellular character with pockets 38a opening through the outer sides.

Means are provided for causing the outer baffle member to swing outwardly or to open position when the inner member is swung inwardly or to open position. This means may take various forms. In the present structure the corresponding ends of the baffle members are connected by links 39 and 40, the link 39 being pivoted as shown at 41 to the upper portion of the inner baffle member 25, the link 40 being correspondingly pivoted, as illustrated at 42, to the upper portion of the outer baffle member. The links are pivoted at 43, and this pivotal connection is located at a point where it will move vertically or parallel to the side bars 11 of the window frame. To secure this vertical movement each of the connecting pivots 43 is pivoted to a slide block 44 that reciprocates in an overhung guideway 45 formed by a channel plate secured to the inner side of the adjacent frame bar 11. This block 44 not only acts as a guide, but it also constitutes a friction holding element. For that purpose its lower end portion is longitudinally bifurcated as shown at 46, and a taper screw 47 (see Figure 7), threaded into the legs of the bifurcated portion, acts to spread them apart and thus create any desired amount of friction between the sliding block and the guideway in which it slides.

Cooperatively related to the baffle members 25 and 33, is an intermediate acoustical baffle plate 48 that depends from the frame bar 19 to a point substantially below the tops of the baffle members 25 and 33 and has an offset portion 49 that receives the upper end of the inner baffle member 25 when the latter is closed, as shown in Figure 2. This plate 48 has a portion 50 outstanding beyond the outer side of the frame bar 13 (to which the strip is secured as indicated at 51), the outstanding portion having a downturned outer margin and being also provided with a depending flange 52 on its underside and behind the downturned outer margin. This part 52 constitutes an abutment against which the upper frame bar of the outer baffle member 33 abuts, and as shown in Figure 2 when in such abutting relation, the part 50 constitutes a shield or deflector for rain or water dripping downwardly from the window-sash above. It will also be noted that the lower cross bar of the outer member 33 has a depending outwardly curved flange 53 that rides against the outer flange 17 of the lower cross bar 12, thus overlapping the same and creating a tight joint against the entrance of the outside elements when closed, but is spaced to drain when open.

As will be clear by a comparison of Figures 1 and 2, when ventilation is desired within a room equipped with the above described structure, it is only necessary to unlatch the inner baffle member 25 and swing it inwardly as far as desired. When this is done, through the link structure 39—40, the outer baffle member 33 is correspondingly moved outwardly, thus providing an opening through the window below the sash. Because of the relation of the baffle members, while air can pass with relative freedom through the opening, sound is muffled by the baffle members including the depending weather strip 48. Sound therefore is to a great degree excluded from the room. The baffle members may assume various angles of inclination and will retain their different positions by reason of the frictional holding action of the slide blocks 44. When the device is closed, it will be noted that both baffle members are in substantially vertical position so that they occupy no more room than the window frame and by reason of their parallel relation, actually constitute a double window structure which admits light without material distortion.

That the structure may be modified will be evident by reference to Figures 9 and 10. Therein the vertical frame bars of the window are designated 54 with the lower cross bar 55 and the intermediate cross bar 56 that defines the top of the ventilating opening. Inner end wing walls 57 and outer end wing walls 58 are provided. Between them swing respectively the inwardly opening baffle member 59 and the outer baffle member 60, pivotally mounted at their lower ends, as shown at 61 and 62. The inner member is provided with an operating handle 63 and latch 64 instead of a link connection between the two. In this form of structure intermeshing gear segments 65 are employed that are mounted at the lower ends of the baffle members. The arrangement is such therefore that when the inner member is swung inwardly, the outer member is automatically swung outwardly and vice versa.

Another modification is illustrated in Figures 11 and 12. One of the vertical frame bars is shown at 66, the lower cross bar being designated 67, and the intermediate cross bar is illustrated at 68. In this structure an inwardly extending bottom wall 69 of sheet metal is secured by the fasteners 70 to the cross bar 67, and has along its inner edge, an upstanding flange 71. End walls or plates 72 are secured by the fasteners 73 to the vertical frame bars 66.

The outer baffle member, designated 74, is hinged, as illustrated at 75, at its lower end and swings outwardly to open position. The inner baffle member 76 is hinged, as shown at 77 to the upstanding flange 71 of the bottom wall 69 and swings inwardly to open position. The two baffle members 74 and 76 are connected by the link structure 78—79, the two links being connected by a pivot 80 having a head slidable in a guideway 81. The guideway, in this instance it will be noted by reference to Figure 12, is secured to the inner side of the end wall 72. It will of course be understood that this structure is duplicated on the other side. The usual latch and operating means is shown at 82. A fixed vertical baffle member 83 is located in the frame at the upper portion of the opening.

In order to provide a weather shield and joint strip, a plate 84 is secured to the underside of the cross rail 68 and has an outstanding portion, beneath which the outer baffle member is located when in closed position, as indicated in dotted lines in Figure 11. There is also provided a depending U-shaped member 85 that is interposed between the plate 84 and the fixed baffle member 83. This provides a channel or pocket 86 that re-

ceives a hood piece 87 carried by the upper free end of the inner baffle member 76.

As the baffle members in this structure are spaced apart a considerable distance, even when in closed relation, room is afforded by reason of the bottom wall 69 for the reception of sound deadening or absorbing material where desired. In the disclosure this material is shown in the form of a sheet 88 that rests upon the bottom 69 and may be surrounded with upstanding strips 89. While this material may be of any desired character, it is preferably formed of perforated cellular material such as that commercially known as "Acousti-Celotex". The hood 87 may be provided with a similar sheet 90 located in opposition to the sheet 88.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

What we claim is:

1. In a baffle structure, the combination with an angular frame, of inwardly and outwardly opening baffle members on opposite sides of the frame, and a common weather strip carried by the frame and interposed between the baffle members when in closed position, said strip having a portion that extends over the outer baffle member when in closed position to constitute a rain deflector.

2. In a baffle structure, the combination with an angular frame having upright side bars and guideways carried by the inner sides thereof, of outer and inner swinging baffle members pivoted to the lower portion of the frame and swinging to closed position against the same, links pivoted to the baffle members and to each other, the pivotal connection between them operating longitudinally of the guideways, friction shoes connected to the link pivots and operating in the guideways, and an operating handle and latch on the inner baffle member adapted to engage with the frame to lock both baffle members in closed positions.

3. In a baffle structure of the character set forth, the combination with a frame, of a bottom wall offset from the frame, a sound absorbing material on the upper side of the wall, a closure member hinged at the free edge of the wall and movable between an open and closed position with respect to the frame, and an inwardly extending sound absorbing plate carried by the free swinging end of the closure member and moving therewith.

4. In a baffle structure of the character set forth, the combination with a frame for placement in a window or other vent opening, of inset bottom and end walls carried by the frame, an inwardly opening baffle member pivoted to the bottom wall and operating between the end walls, an outwardly opening baffle member pivoted at its lower end to the frame, means for causing the two baffle members to open and close when one is operated, and sound deadening material mounted on the bottom wall.

5. In a sound excluding ventilator, the combination with a frame defining a ventilating opening, of a sound baffling member mounted on the frame and movable between a position to close the opening and a position to permit the passage of air through the opening, and a hood piece carried by the member and projecting beyond the same toward the ventilating opening, said hood piece including sound absorbing material located on the inner side of the projecting portion and facing longitudinally of the ventilating opening.

6. In a sound excluding ventilator, the combination with a frame defining a ventilating opening and including a bottom wall, of a sound baffling member hinged to the bottom wall and movable between a position to close the opening and a position to permit the passage of air through the opening, sound absorbing material on said bottom wall, a hood piece carried by the free upper portion of the sound baffling member and extending toward the frame over the bottom wall, and sound absorbing material on said hood piece located in opposition to and facing the sound absorbing material of the bottom wall.

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