

Nov. 2, 1943.

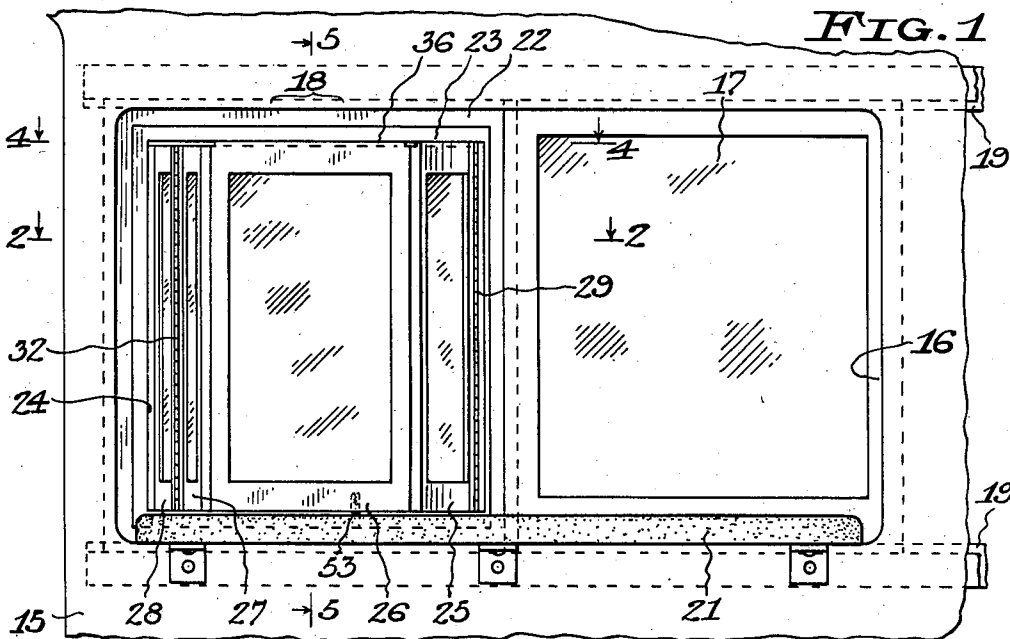
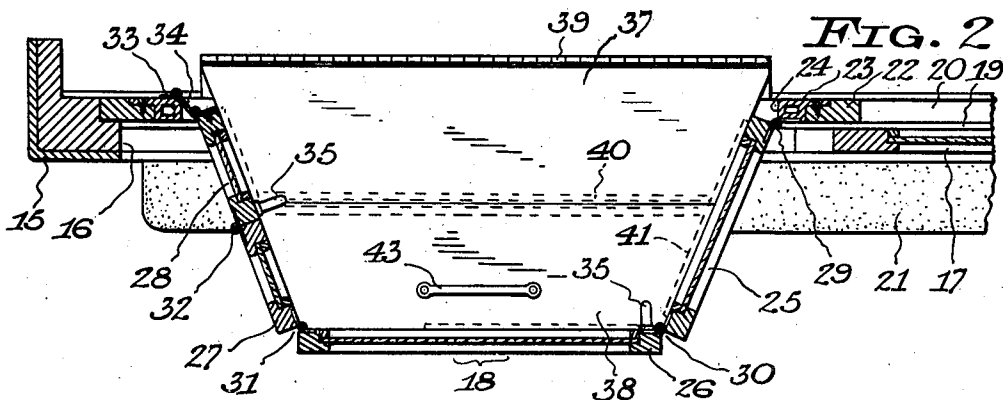
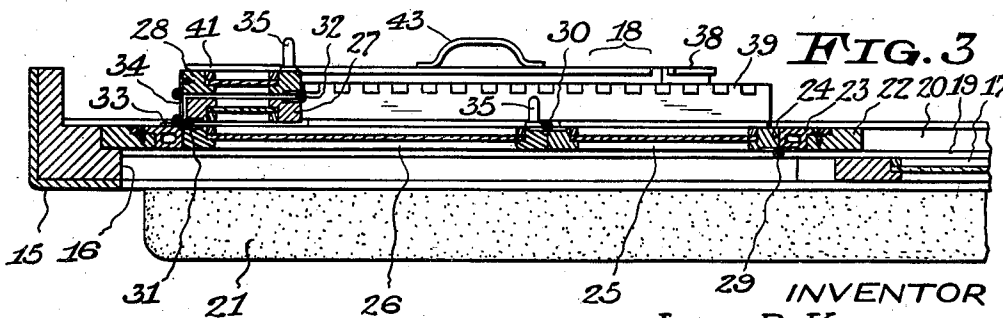
J. B. KAUFFMAN

2,333,574

LOCOMOTIVE WINDOW

Filed Dec. 18, 1942

3 Sheets-Sheet 1



INVENTOR
JOHN B. KAUFFMAN
BY *Christopher L. Waal*
ATTORNEY

Nov. 2, 1943.

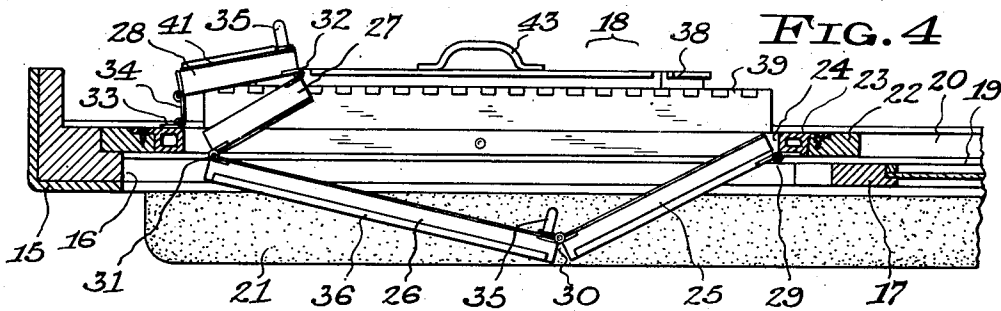
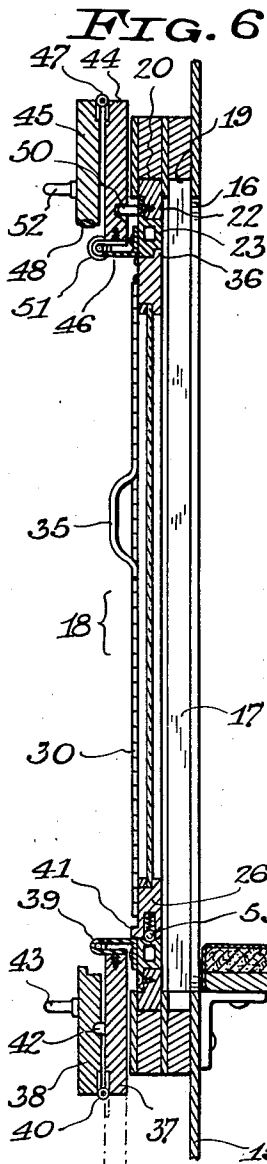
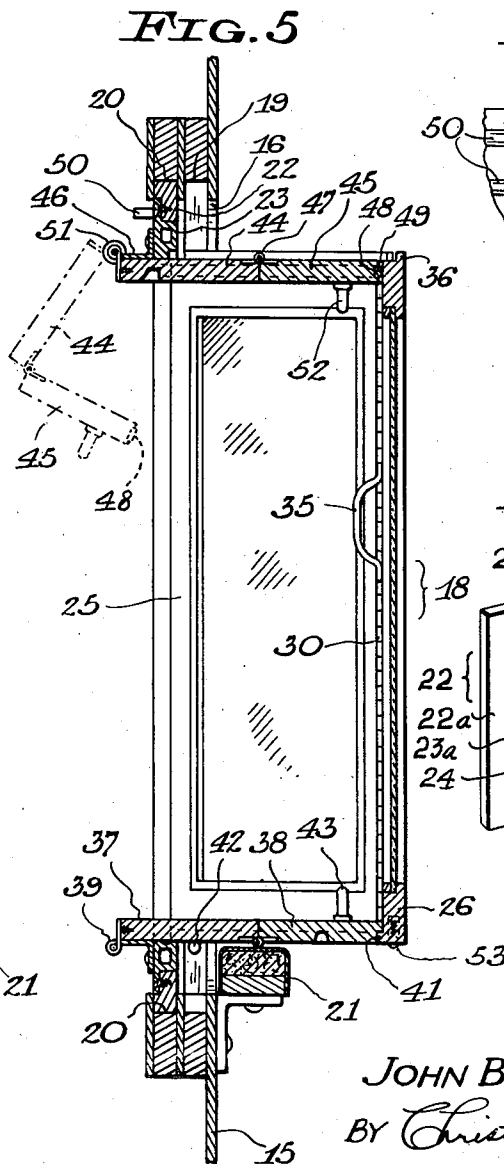
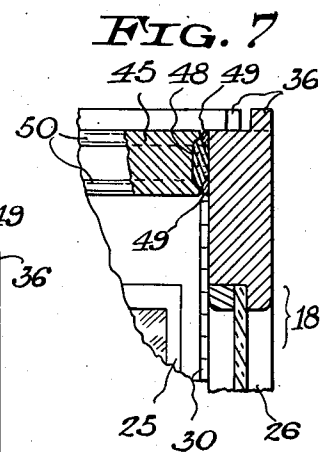
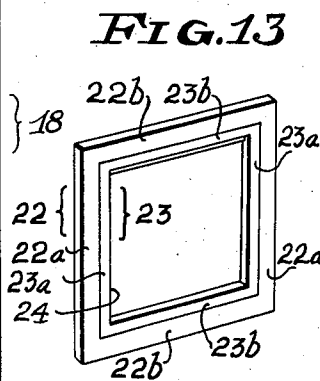
J. B. KAUFFMAN

2,333,574

LOCOMOTIVE WINDOW

Filed Dec. 18, 1942

3 Sheets-Sheet 2



INVENTOR
JOHN B. KAUFFMAN
BY Christopher L. Ward
ATTORNEY

Nov. 2, 1943.

J. B. KAUFFMAN

2,333,574

LOCOMOTIVE WINDOW

Filed Dec. 18, 1942

3 Sheets-Sheet 3

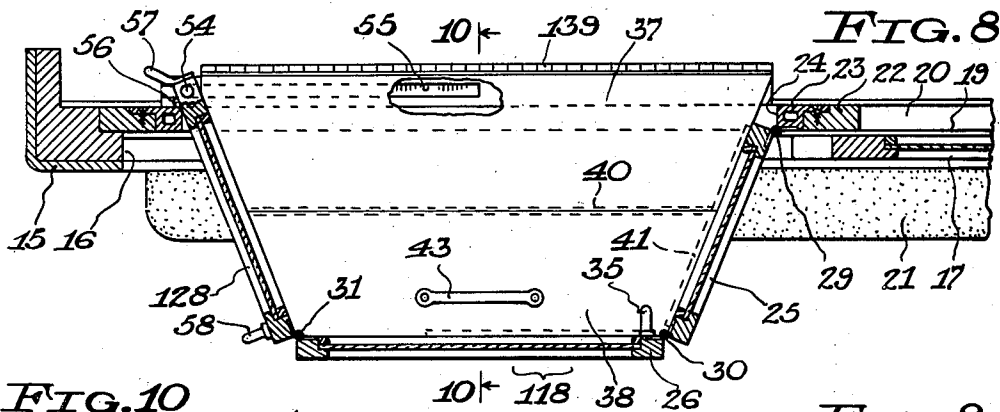


FIG. 10

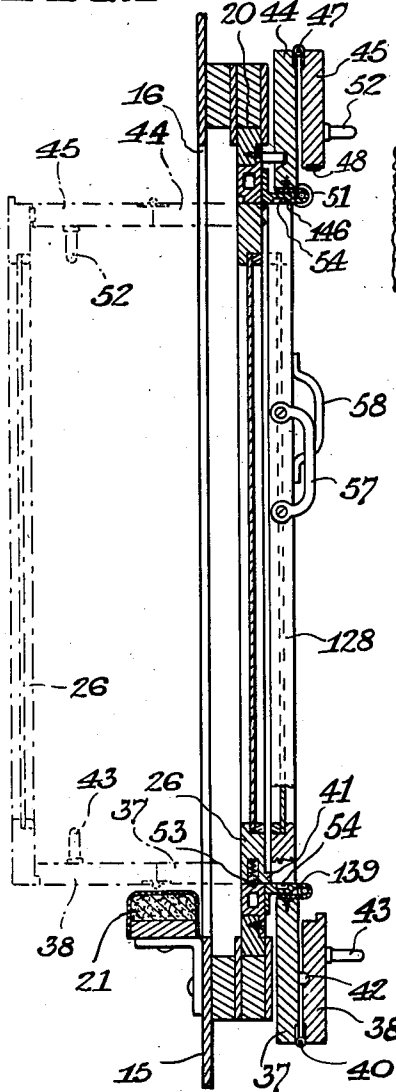
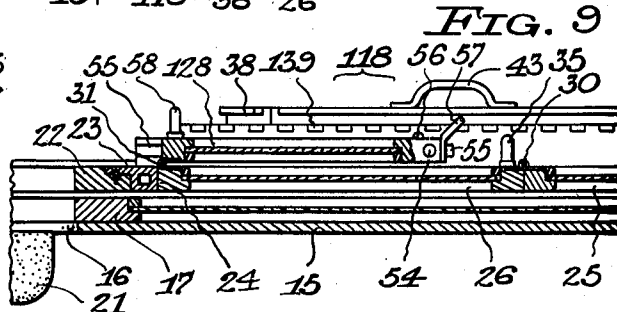


FIG. 9

FIG. 11

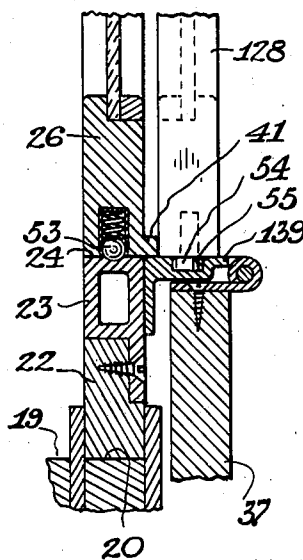
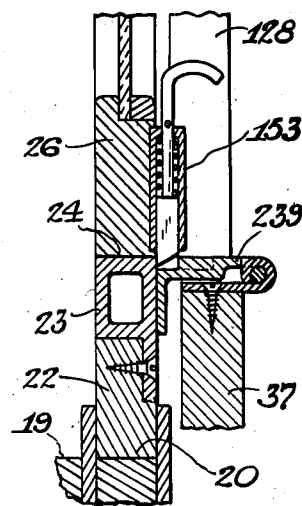


FIG. 12



INVENTOR
JOHN B. KAUFFMAN
By Christopher L. Waal
ATTORNEY

UNITED STATES PATENT OFFICE

2,333,574

LOCOMOTIVE WINDOW

John B. Kauffman, Janesville, Wis.

Application December 18, 1942, Serial No. 469,406

13 Claims. (Cl. 160—182)

The present invention relates to windows adapted for use on locomotive cabs and the like, and more particularly to windows of the laterally extensible type.

An object of the invention is to provide an improved folding window of simple and rugged construction adapted to be mounted on a locomotive cab and readily adjustable to form at the side of the cab a projecting shield or enclosure for protecting the engineer when he leans outward to obtain his view.

Another object of the invention is to provide a locomotive cab window of this character which is easily and quickly movable out of the way to avoid obstructions near the trackway and to permit the free use of the window opening of the cab as an emergency exit for the engineer.

A further object is to provide a folding window which can be readily applied to a locomotive cab in place of one of the conventional sliding sashes, and which when in folded condition is freely slidable along the sash guideways.

A still further object is to provide a cab window which is compactly foldable and which can be expeditiously manipulated to its folded and extended positions without danger of jamming or binding.

The invention further consists in the several features hereinafter described and claimed.

In the accompanying drawings, illustrating certain embodiments of the invention:

Fig. 1 is a side elevation of a window of the invention as it appears applied to a locomotive cab, the window being shown in its outwardly projecting position;

Fig. 2 is a sectional view taken generally along the line 2—2 of Fig. 1;

Fig. 3 is a sectional view similar to Fig. 2, but showing the window in its folded or retracted position;

Fig. 4 is a sectional view taken generally along the line 4—4 of Fig. 1, but showing the window in an intermediate passing position;

Fig. 5 is a sectional elevation taken generally along the line 5—5 of Fig. 1, the window being in its outwardly projected position;

Fig. 6 is a sectional elevation similar to Fig. 5, but showing the window in the folded or retracted position indicated in Fig. 3;

Fig. 7 is a detail sectional elevation of the upper portion of the window in its projected position;

Fig. 8 is a sectional view similar to Fig. 2, but showing a modified form of window;

Fig. 9 is a sectional view of the window of Fig.

8 in its folded or retracted condition and moved along its trackways to a position exposing the window opening of the cab;

Fig. 10 is a sectional elevation similar to Fig. 6 and showing the window of Fig. 8 in its closed or retracted position, an extended position of the window being shown in broken lines;

Fig. 11 is a detail sectional elevation of the lower portion of Fig. 10;

Fig. 12 is a view similar to Fig. 11, but showing a modified form of retaining means for holding the window in its folded position, and

Fig. 13 is a detail perspective view of a slidable window frame.

In the form of the invention shown in Figs. 1 to 7 of the drawings, the numeral 15 designates a locomotive cab having the usual window opening 16 in its side wall. The opening is adapted to be closed by one or more slidable windows, two being shown in the present instance and being designated generally by the numerals 17 and 18. The window 17 is of conventional type, while the window 18 is constructed in accordance with the present invention, as hereinafter more fully described. The windows 17 and 18 are slidably mounted in the usual horizontal outer and inner channel guideways 19 and 20, respectively, arranged at the inner side of the cab side wall, these guideways extending in parallel relation adjacent to the upper and lower edges of the window opening. In the closed position of the windows, the rear edge of the front window overlaps the front edge of the rear window, as seen in Figs. 2 and 3. The windows are movable forwardly along their guideways to expose the window opening so that the engineer may lean out of the opening to view the track and to observe signals. The cab is provided with the usual outwardly projecting padded arm rest 21 extending along the bottom edge of the window opening.

The cab window opening 16 is made rather large, not only to provide good visibility but also to form an emergency exit for the engine crew, so that they may quickly escape from the cab in case of necessity. For example, the cab of a steam locomotive may become filled with live steam, as by the breaking of a gage glass. If the windows 17 and 18 happen to be in closed position during such accident they can be slid quickly to their open position.

In a cab window structure of conventional type the inner slidable window is like the outer window 17. These windows are closed in severe weather, but because of poor visibility it is usually necessary to open them at intervals to per-

mit the engineer to project his head outwardly through the window opening and thus improve his view. Such exposure, however, may cause considerable physical discomfort and pain.

In accordance with the present invention, the conventional plain inner window is replaced by the window 18, which is extensible from the side of the cab and which will permit the engineer to project his head outwardly beyond the plane of the cab wall so as to have an unobstructed view, the window forming a shield or protector for the engineer. This window is further arranged to permit quick and easy retraction for avoiding damage by obstacles near the track and for allowing the window to be slid quickly to open position, so as not to interfere with the use of the window opening as an emergency exit.

The window 18 of the present invention includes a rectangular frame which is slidable in the guideways 20 and is here shown to consist of an outer frame member 22 and an inner frame member 23 detachably secured together, the inner frame member defining an opening 24 between its side uprights or stiles. The frame may be constructed of wood or metal, or both of these materials, and in many instances the outer frame member may be of wood so as to permit easy trimming to fit the cab guideways 20, especially in cases where it is desired to apply the window to an existing locomotive. As shown in detail in Fig. 13, the outer frame member 22 of the rectangular frame has side rails or uprights 22a and top and bottom rails 22b, and the inner frame member 23 has side rails or uprights 23a and top and bottom rails 23b.

An articulated multiple section sash assembly, comprising a series of pivotally connected glazed sash members or panels 25, 26, 27 and 28, is arranged to close the opening 24 in the frame member 23. The end sash member 25 is secured at its front edge to the front upright of the inner frame member 23 by a vertical hinge 29, and at its rear edge is secured to the front edge of the intermediate or side sash member 26 by a vertical hinge 30. The rear edge of the intermediate sash member 26 is secured to the adjacent edge of the rear sash member 27 by a vertical hinge 31, and the two rear sash members 27 and 28 are connected by a vertical hinge 32. The rear edge of the end sash member 28 is connected to the rear upright of the frame member 23 by a vertical hinge 33 which is preferably a double hinge having an intermediate leaf 34. The intermediate or side sash member 26 is here shown to be considerably wider than the front sash member 25, and the two connected rear sash members 27 and 28, which are relatively narrow, have a combined width about equal to the width of the front sash member. Suitable handles 35 are secured to the inner side of some of the sash members to facilitate the folding and unfolding of these members. These handles are here shown to be secured to the front uprights of the sash members 26 and 28. The combined width of the sash members 25 and 26 is about equal to the width of the frame opening 24, and in the closed position of the foldable window, shown in Figs. 3 and 6, the connected sash members 25 and 26 are in alignment in the plane of the frame 22, 23, and close the frame opening 24, permitting the frame to slide along the guideways 20 in the manner of a conventional plain window, so as to expose the window opening 16 in the cab side wall. In the folded position of the articulated sash assembly, the narrow rear sash members 27 and 28 lie at

the inner side of the rear portion of the sash member 26 in parallel relation to the latter sash member, these three sash members being folded together in pleated or accordian fashion, as seen in Fig. 3. The top edges of the sash members 25 and 26 have stop flanges 36 engageable with the frame member 23 to limit the inward movement of these sash members.

The articulated sash assembly is shiftable outwardly to the projected position shown in Figs. 2 and 5, a passing position of the sash assembly being shown in Fig. 4. In the projected position of the sash assembly the sash member 26 extends approximately parallel to the plane of the cab wall and is spaced outwardly beyond the arm rest 21, and the front sash member 25 and the rear sash members 27 and 28 extend in angular outwardly converging positions, the two rear sash members 27 and 28 being aligned with each other.

A bottom panel of trapezoidal shape forming an auxiliary arm rest or shelf, and preferably consisting of two hingedly connected sections 37 and 38, is adapted to extend within the lower portion of the outwardly projected sash assembly, as seen in Figs. 2 and 5. The inner panel section 37 is pivotally secured to the horizontal bottom rail of the window frame member 23 by a hinge 39 having an L-shaped hinge leaf attached to this frame member, the hinge axis extending parallel to this rail and being spaced inwardly from the inner face of the frame member. The two sections of the bottom panel are connected by a hinge 40 extending parallel to the mounting hinge 39. In its shelf-forming position the articulated bottom panel is suitably supported by the lower edge portions of one or more of the sash members 25, 26, and 28, as by inner ledge-forming ribs 41 on these sash members. When the bottom panel is in its shelf-forming position, the articulated sash assembly is held in its extended position, forming a bay window, as seen in Fig. 2, and cannot collapse. In the retracted position of the bottom panel, seen in Fig. 6, the panel section 37 hangs below the hinge 39 and the panel section 38 is folded upwardly adjacent to its companion section and is suitably held in place as by a friction catch 42. If desired, the panel section 38 may merely hang below the section 37, as shown by dotted lines in Fig. 6. A suitable handle 43 is secured to the panel section 38 to facilitate the manipulation of the bottom panel.

An articulated top panel 44, 45, generally similar to the bottom panel, forms a cover or roof for the outwardly projected sash assembly, the inner panel section 44 being pivotally secured to the horizontal top rail of the window frame member 23 by a mounting hinge 46 similar to the bottom panel mounting hinge 39, and the two panel sections 44 and 45 being connected by a hinge 47. The front, outer and rear edges of the top panel are provided with sealing strips 48 of rubber or other suitable resilient material having a frictional sealing engagement with the inner side walls of the several sash members. These sealing strips serve to exclude the weather and also hold the top panel in its extended position. Preferably, spaced ribs or beads 49 are secured along the inner walls of one or more of the sash members near their upper edges to form a shallow channel or seat for receiving the sealing strips. In some instances, the sealing strips may be secured to the sash members instead of to the top panel.

In the retracted position of the top panel, seen

in Fig. 6, the panel section 44 extends vertically above the hinge 46 and the panel section 45 is folded downwardly adjacent to its companion section. The panel section 44 is suitably held in place as by a friction catch 50. In some instances, the hinge 45 may have a coiled torsion spring 51 urging the panel section 43 to its inner position. A handle 52 is secured to the panel section 45 to facilitate manipulation of the top panel. A passing position of the articulated top panel 44, 45 is shown by dotted lines in Fig. 5.

The articulated sash assembly is releasably retained in the closed position of Figs. 3 and 6 in any suitable manner, as by frictional engagement with the frame member 23. If desired, latch or catch means, such as a friction ball catch 53, may be provided to hold the sash assembly in its closed or retracted position.

The window 18 is readily mounted on the guideways 20 of the locomotive cab, either during the construction of the cab or as a replacement of an existing cab window of the plain sliding type. In the latter case, the outer frame member 22 of the window 18 has the same external dimensions as the plain window which is replaced.

In pleasant weather both of the windows 17 and 18 are slid forwardly along their guideways, exposing the cab wall opening 16, so that the engineer may lean out of the opening for clear unobstructed vision. With the articulated sash assembly in its closed or retracted position, the window 18 is freely slidable along its guideways without striking the window 17.

To close the cab wall opening 16, the windows 17 and 18 are slid rearwardly along their guideways to the position shown in Fig. 3, and in this position the sash members 25 and 26 permit a clear view laterally of the cab. When the window 18 is to be used as a projecting shield for the engineer, the articulated sash assembly is pushed outwardly to the position seen in Fig. 2, and the articulated top and bottom panels are then swung outwardly to the position seen in Figs. 2 and 5. Into the shield thus formed the engineer may extend his head, so as to have clear vision forwardly and rearwardly, as well as laterally, without exposing himself to inclement weather. In some instances, the projected sash assembly will have a sufficient shielding action without requiring the extension of the top panel to its roof-forming position.

In the event it becomes necessary for the engineer to use the cab window opening 16 as an emergency exit, as in the case of the cab becoming accidentally filled with live steam, the window 18 can be quickly moved out of the way without danger of jamming or binding. This is accomplished by swinging the articulated top and bottom panels of the window into the cab and pulling the articulated sash assembly inwardly to align the sash members 25 and 26 with the window frame, as shown in Fig. 3, whereupon the window 18, and also the window 17, can be slid forwardly along their guideways to fully expose the cab window opening. In the folded or retracted position of the window, the inner movable parts of the window extend only a short distance within the cab, thus avoiding interference with the engineer or the control mechanism in the cab.

The window, when in its projecting shield-forming position, comes within the usual clearance limits. However, the locomotive may be required to pass nearby structures, such as doorway frames of roundhouses and factories, with

very little clearance, and in such cases the hinged window parts can be quickly retracted to the temporary position shown in Fig. 4.

While the guideways 19 and 20 are here shown to be grooves or channels slidably receiving the edges of the window frames, it will be obvious that other conventional forms of guideways may be used. In some cases, the window of the present invention may be the only window for the cab wall opening.

The modified form of window shown in Figs. 8 to 11 is generally similar to that of Figs. 1 to 7, but the articulated sash assembly has a single rear sash member 128 instead of two rear sash members; the sash member 128 being pivotally and slidably connected to the frame member 23. The rear sash member 128 has an upright edge portion or stile pivotally connected to the intermediate sash member 26 by a hinge 31, and the opposite upright edge portion of the rear sash member is provided with vertically aligned upper and lower gudgeons or pivot pins 54 which are slidable in respective horizontal channel guideways 55 formed in the fixed L-shaped leaves of hinge members 146 and 139, corresponding to the hinge members 46 and 39 of the device of Figs. 1 to 7. The guideways 55 extend approximately parallel to the horizontal upper and lower rails of the window frame member 23. The top and bottom panels of the window are like those of the device of Figs. 1 to 7.

In the extended position of the sash assembly, seen in Fig. 8, the gudgeoned end of the rear sash member 128 bears against the rear upright of the frame member 23, the sash assembly being retained in extended position by the extended bottom panel 37, 38. In some instances a vertical rib 56 may be secured along the rear upright of the sash member 128 to form an abutment member engageable with the inner face of the rear upright of the frame member 23 to form a seal and also to relieve the pressure on the gudgeon pins 54. The rear sash member is here shown to be provided with handles 57 and 58 to facilitate manipulation.

In the folded or retracted position of the window of Fig. 8, the connected sash members 25 and 26 are in alignment in the plane of the frame 22, 23, as seen in Fig. 9, and close the frame opening 24, permitting the frame to slide along the guideways 20, as in the device of Figs. 1 to 7. In the folded position of the articulated sash assembly, the rear sash member 128 lies at the inner side of the rear portion of the sash member 26 and parallel to the latter sash member, as seen in Fig. 9. The articulated top and bottom panels are foldable as in the device of Figs. 1 to 7.

When the window of Figs. 8 to 11 is to be used as a projecting shield for the engineer, the articulated sash assembly is pushed outwardly to the position shown in Fig. 8, the gudgeoned end of the rear sash member 128 being slid rearwardly along the guideways 55. The articulated top and bottom panels are then swung outwardly to their extended positions. When the window is to be folded, the top and bottom panels are swung into the cab and the gudgeoned end of the rear sash member is slid forwardly along the guideways 55, whereupon the sash members 25 and 26 are pulled inwardly to a position into alignment with the window frame. The sash members 25 and 26 are retained in their inner position by their frictional engagement with the frame member 23, or by the spring friction catch 53.

Instead of using a friction catch, a manually

releasable spring latch 153 may be provided, as seen in Fig. 12, to more positively retain the sash members in their closed or retracted position. The mounting hinge 239 for the bottom panel is suitably recessed to admit the bolt of the latch. The latch 153 may be used on either form of window.

Certain specific embodiments of the invention have been shown and described, but it will be understood that changes and modifications may be made therein within the spirit of the invention.

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

1. In combination, a window frame having an opening, a sash assembly for said opening comprising a plurality of sections pivotally connected together in serial relation and having parallel pivotal axes, the opposite end portions of said sash assembly being pivotally connected to said frame on axes substantially parallel to said first-named axes, said sash assembly being projectable outwardly from said frame to a bay-window formation, and means for releasably retaining said sash assembly in its projected position, said sash assembly when retracted having a portion of its length closing said opening and the rest of said sash assembly being folded at the inner side of said first-named portion in substantially parallel relation to said frame.

2. For mounting on a wall having a window opening therein and guideways adjacent to the upper end lower edges of said opening, the combination of a frame adapted for movement along said guideways and having an opening, a sash assembly for said frame opening comprising a plurality of sections pivotally connected together in serial relation and having parallel pivotal axes, the opposite end portions of said sash assembly being pivotally connected to said frame on axes substantially parallel to said first-named axes, said sash assembly being projectable outwardly from said frame to a bay-window formation, and means for releasably retaining said sash assembly in its projected position, said sash assembly when retracted having a portion of its length closing said frame opening and the rest of said sash assembly being folded at the inner side of said first-named portion in substantially parallel relation to said frame, said frame being movable along said guideways to close and expose said wall opening.

3. In combination, a frame having an opening, a multiple section sash movably mounted on said frame and extending across said opening, said sash being extensible outwardly from said frame to a bay-window formation, and means for releasably retaining said sash in its extended position, said sash when retracted having some of its sections in alignment for closing said opening and the rest of the sash being folded at the inner side of said aligned sections in substantially parallel relation to said frame.

4. In combination, a frame having an opening, a sash assembly for said opening comprising four sections pivotally connected together in serial relation and having parallel pivotal axes, the terminal sections being pivotally connected to the opposite side portions of said frame on axes substantially parallel to said first-named pivotal axes, said sash assembly being projectable outwardly from said frame to a bay-window formation, and means for releasably retaining said sash assembly in its projected position, said sash assembly when in retracted position having one of the end sections and the adjacent intermediate section sub-

stantially in alignment to close said opening, and the other two sections being movable to a folded position at the inner side of said intermediate section.

5. In combination, a frame having an opening, a sash assembly for said opening comprising a plurality of sections pivotally connected together in serial relation and having parallel pivotal axes, one terminal section being pivotally connected to one side of said frame, and the other terminal section having a pivotal and slidable connection with said frame and movable along said frame, said sash assembly being projectable outwardly from said frame to bay-window formation, and means for releasably retaining said sash assembly in its projected position, said sash assembly when in retracted position having said first-named end section and the adjacent intermediate section substantially in alignment to close said opening, and the other terminal section being at the inner side of and substantially parallel to said intermediate section.

6. In combination, a frame having an opening, a sash assembly for said opening comprising three sections pivotally connected together in serial relation and having parallel pivotal axes, one terminal section being pivotally connected to said frame on a substantially vertical axis parallel to said first-named pivotal axes, said frame having a substantially horizontal guideway extending therealong and the other terminal sash section being pivotally mounted on said frame and slidable along said guideway, said sash assembly being projectable outwardly from said frame to form a bay window, and means for releasably retaining said sash assembly in its projected position, said first-named terminal sash section and the intermediate section adjacent thereto having a combined width approximately equal to the width of said frame opening and being movable inwardly from their projected position substantially into the plane of said frame to close said opening, and the slidably mounted terminal sash section being movable to a folded position at the inner side of said intermediate sash member.

7. For mounting on a wall having a window opening and having substantially horizontal sash guideways at the inner side of said wall, the combination of a frame adapted to slide along said guideways and having an opening, a multiple section sash pivotally connected to said slidable frame and extensible outwardly through said wall opening to a bay-window formation, and means for releasably retaining said sash in its extended position, said sash being foldable to a retracted position with some of the sections thereof closing said frame opening and the rest of the sections at the inner side of said last-named sections.

8. In combination, a frame having an opening, a sash assembly for said opening comprising four sections pivotally connected together in serial relation and having parallel pivotal axes, the terminal sections being pivotally connected to said frame and having pivotal axes parallel to said first-named axes, one of said terminal sections and the adjacent intermediate section being movable into alignment to close said opening and having a combined width substantially equal to the width of said opening, the other terminal section and the section adjacent thereto having a combined width approximately equal to the width of said first-named terminal section and being foldable on themselves at the inner side of said intermediate section, said sash assembly

being extensible outwardly from said frame to a bay-window formation, and means for releasably holding said frame assembly in its extended position.

9. In combination, a frame having a window opening, a multiple-section sash for said opening comprising a plurality of pivotally connected sections, one terminal sash section being pivotally connected to one side portion of the frame and the other terminal section having a double hinge connection with the other side portion of the frame, said sash being extensible outwardly to a bay-window formation, and means for releasably retaining said sash in its extended position, said sash when retracted having said first-named terminal sash section and the adjacent intermediate section in alignment to close said opening, and the other terminal section and the section adjacent thereto being folded on themselves at the inner side of said intermediate section in substantially parallel relation to said frame and with said adjacent section interposed between said intermediate section and said last-named terminal section.

10. In combination, a frame having an opening, an articulated multiple section sash for said opening having its opposite end portions pivotally connected to said frame, said sash being extensible outwardly to a bay-window formation, and means for releasably retaining said sash in its extended position, said sash when in retracted position closing said opening and having a portion folded at the inner side of said opening in substantially parallel relation to said frame.

11. In combination, a frame having an opening, a folding multiple-section sash assembly for said opening movably connected to said frame and extensible outwardly from said frame to bay-window formation, a top panel pivotally supported at the inner side of said frame and swingable outwardly through said opening into the extended sash assembly, and means for frictionally retaining said panel in its extended position.

12. In combination, a frame having an opening, a folding multiple-section sash assembly for said opening movably connected to said frame and extensible outwardly from said frame to bay-window formation, a top panel pivotally supported at the inner side of said frame and swingable outwardly through said opening into the extended sash assembly, and resilient sealing means for frictionally retaining said panel in its extended position.

13. For mounting on a wall having a window opening and guideways at the inner side of said wall, the combination of a frame adapted to slide along said guideways and having an opening, an articulated foldable sash assembly movably mounted on said frame and extensible outwardly to a bay-window formation, and a bottom panel for releasably holding said sash assembly in its extended position and having a pivotal connection with the lower portion of said frame, said bottom panel being swingable through said frame opening and when in its inner position being pivotally suspended at the inner side of said frame.

JOHN B. KAUFFMAN.