

June 30, 1936.

E. F. GAINES ET AL

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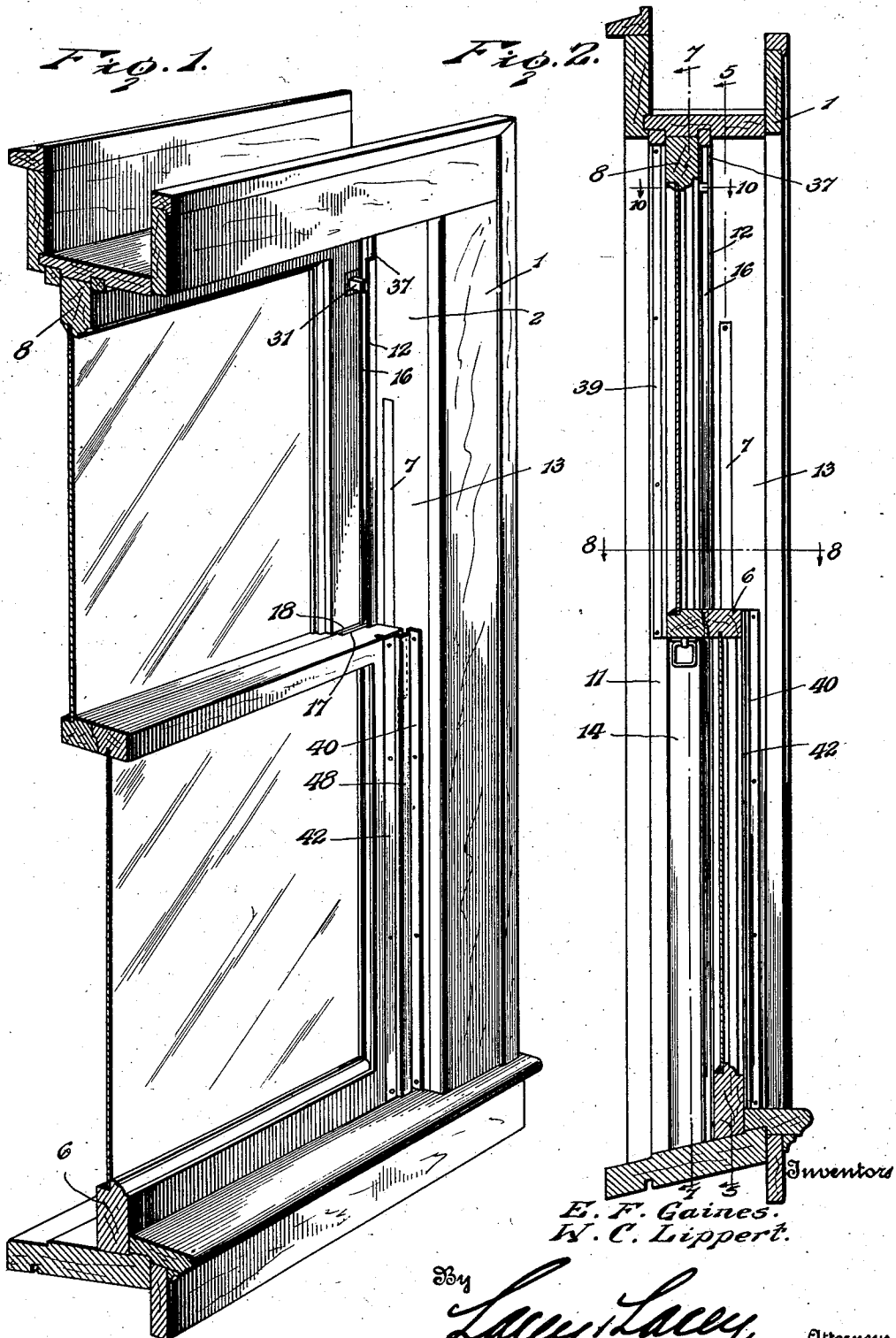
WINDOW

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5 Sheets-Sheet 1

Fig. 1.

Fig. 2.



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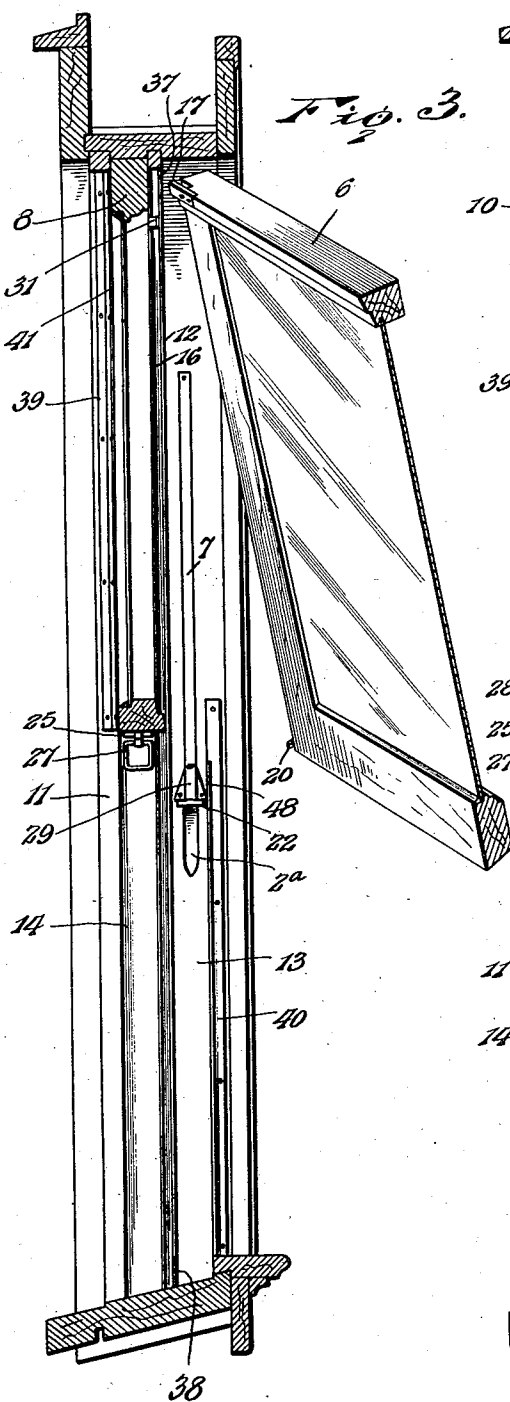
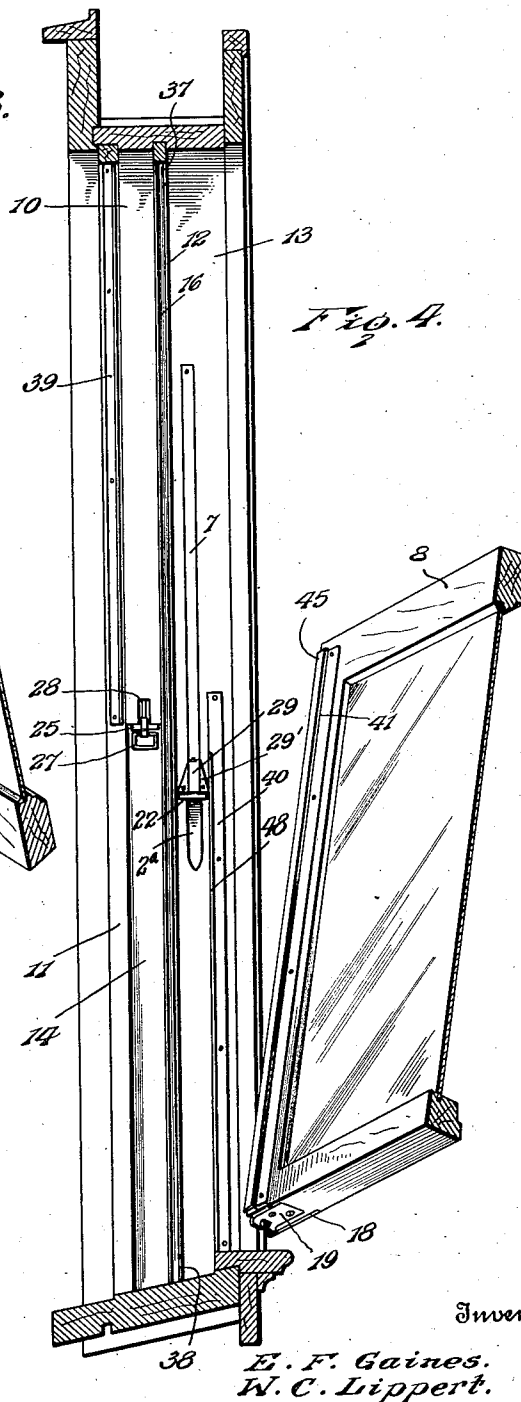
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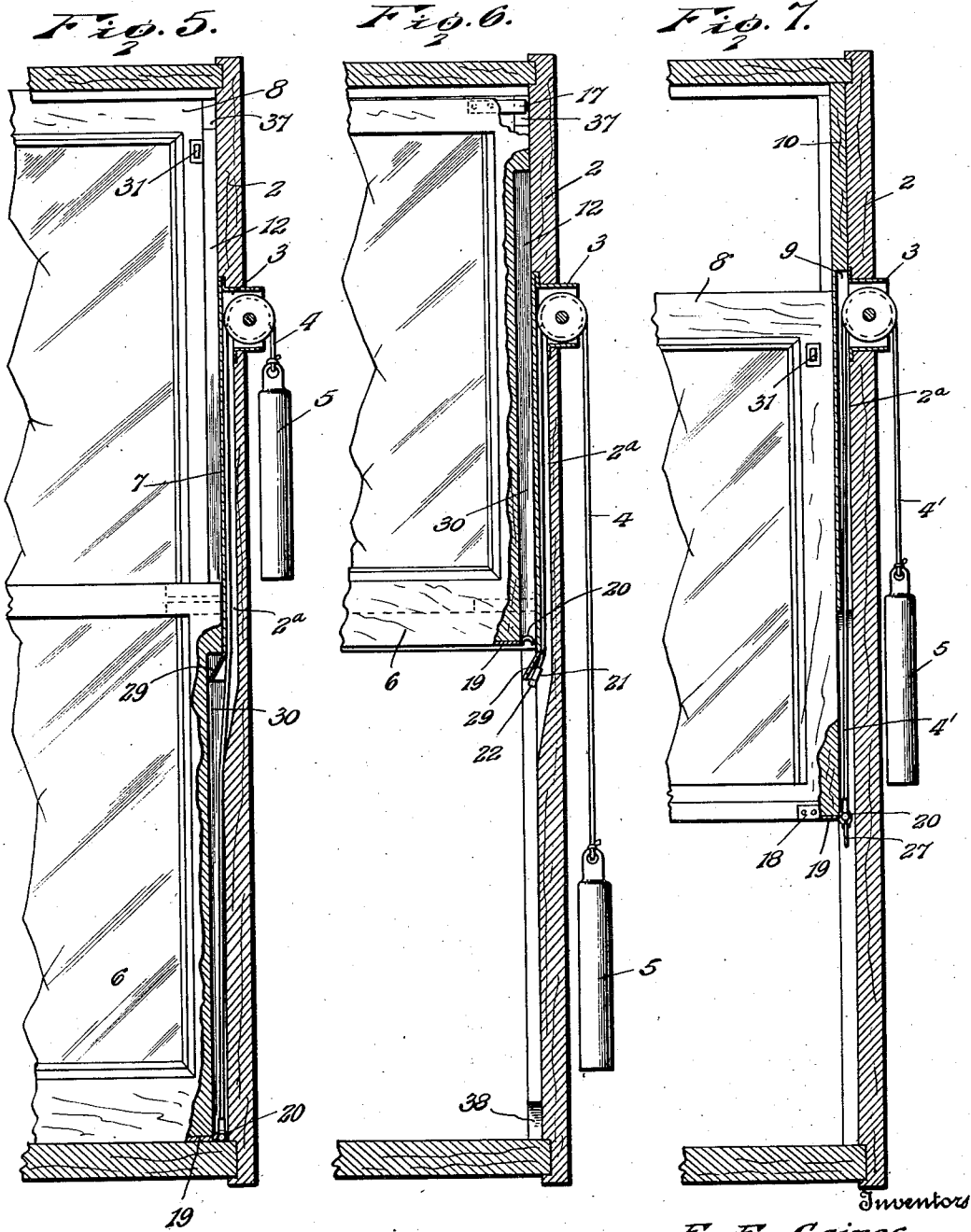
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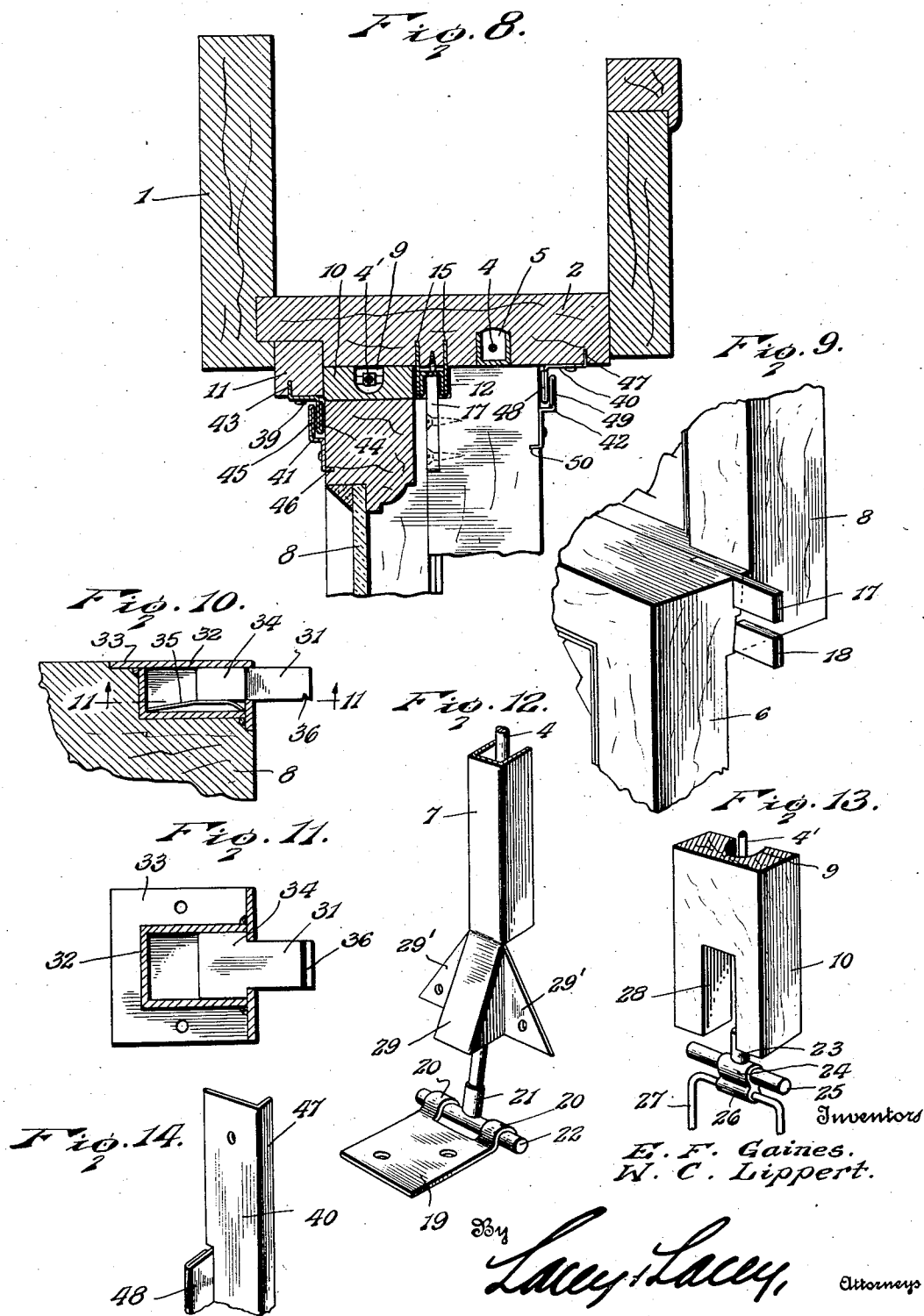
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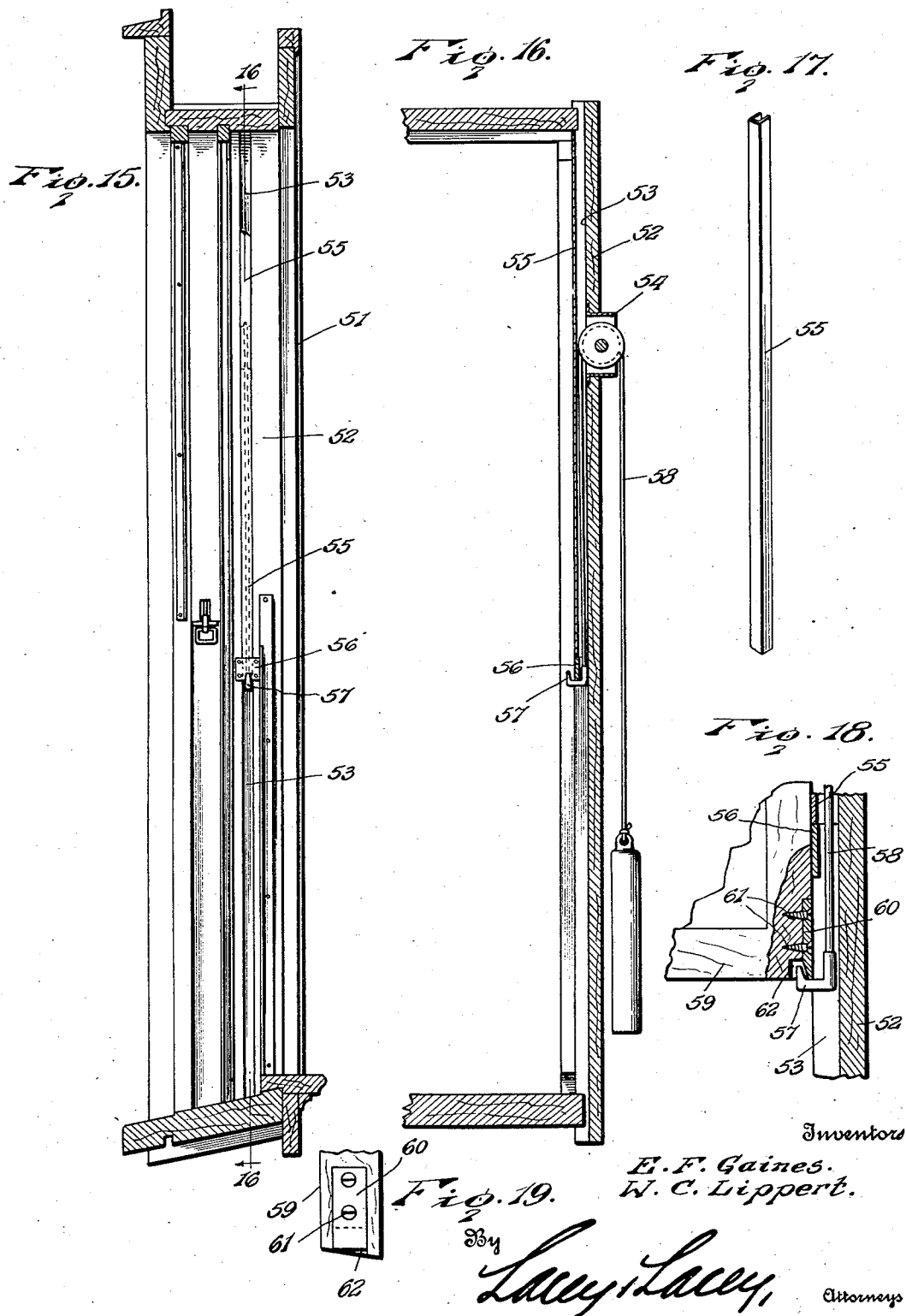
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WINDOW

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UNITED STATES PATENT OFFICE

2,046,259

WINDOW

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Application April 25, 1935, Serial No. 18,230

8 Claims. (Cl. 20—52.2)

This invention relates to an improved window construction, and more particularly to the manner in which sashes are slidably and removably mounted in a window frame.

One object of the invention is to so construct the window frame and the sashes that the sashes may be very easily released from the weight cords and removed from the frame without the use of a screw driver, hammer, or other tool, and thus permit the sashes to be removed by a person who is not familiar with the use of tools.

Another object of the invention is to not only permit the sashes to be removed without the use of tools but, consequently, eliminate damage to paint upon the frame or sashes and effect a saving in time and labor and also eliminate the necessity of retouching the sash or window frame after the sashes have been removed and replaced.

Another object of the invention is to so mount the sashes that they may be withdrawn from the frame into a room when cleaning and thus permit the inner and outer surfaces of window panes to be very easily and thoroughly washed and, in addition, eliminate danger of a person falling out of a window by sitting or standing upon a window sill in order to wash the outer surface of the window pane.

Another object of the invention is to so mount the sashes in the frame that they may be very easily slid vertically in the frame to opened and closed positions without binding and, in addition, to eliminate the necessity of installing expensive weather stripping in order to exclude air and dust from a building.

Another object of the invention is to provide a window of such construction that the sash cords and pulleys about which they are engaged will be hidden from view and thus add to the appearance of the window by eliminating the unsightly sash cords which are exposed when a lower sash of a window of a conventional construction is moved downwardly to a closed position.

Another object of the invention is to provide improved means for connecting the sash cords with the window sashes and permit the cords to be very easily detached from the sashes when the sashes are to be removed and then reconnected with the sashes when the sashes are replaced in the window frame.

Another object of the invention is to provide sashes which may be moved inwardly into a room when they are detached from the frame and thus allow blinds or screens to be very easily set in place and prevent any danger of the sashes being subjected to the action of strong wind and slip out

of a person's hands, as would be the case if the sashes were moved outwardly from the frame instead of inwardly.

The invention is illustrated in the accompanying drawings, wherein

Figure 1 is a perspective view of the improved window with a portion thereof shown in vertical section.

Figure 2 is a sectional view taken vertically through the improved window with the sashes closed.

Figure 3 is a view similar to Figure 2 illustrating the manner of removing the lower sash.

Figure 4 is a view similar to Figure 3 illustrating the manner of removing the upper sash.

Figure 5 is a sectional view taken vertically along the line 5—5 of Figure 2.

Figure 6 is a view similar to Figure 5 showing the lower sash raised and disposed in position for removal.

Figure 7 is a sectional view taken along the line 7—7 of Figure 2 with the upper sash partially lowered.

Figure 8 is an enlarged sectional view taken through a side portion of the frame along the line 8—8 of Figure 2.

Figure 9 is a fragmentary perspective view of the meeting end portions of the sashes.

Figure 10 is a fragmentary sectional view taken along the line 10—10 of Figure 2.

Figure 11 is a view taken along the line 11—11 of Figure 10.

Figure 12 is a perspective view illustrating the connection between the sash cord and the lower sash, together with the means for detaching the cord from the lower sash.

Figure 13 is a fragmentary perspective view showing the sash cord for the upper sash and the shield for the sash cord.

Figure 14 is a perspective view of the upper end portion of a metal strip secured in the lower portion of the frame and cooperating with a companion metal strip of the lower sash.

Figure 15 is a view similar to Figure 2 illustrating a modified construction.

Figure 16 is a sectional view taken along the line 16—16 of Figure 15.

Figure 17 is a perspective view of the sash cord shield.

Figure 18 is a fragmentary sectional view illustrating the manner in which the lower sash is connected with the sash cord.

Figure 19 is a fragmentary view of a lower corner portion of the lower sash.

The frame 1 may be formed of wood or metal

and of any height and width desired. The side stiles 2 are formed with the usual openings in which pulleys 3 are mounted for engagement by the chains or cords 4 to which the weights 5 are attached, and below the openings through which the pulleys are mounted, the side stiles are grooved, as shown at 2^a, to receive the portions of the sash cords externally of the frame. It should be noted that the pulleys are located in spaced relation to the upper ends of the side stiles and that the grooves 2^a in which the cords for the lower sash 6 move are closed by shields 7 formed of metal strips which are U-shaped in cross section, as shown clearly in Figure 12. The weight cords 4' of the upper sash 8 instead of being disposed in grooves corresponding to the grooves 2^a are received in grooves 9 formed in shields or strips 10 which are secured against the side stiles and are of sufficient thickness to project slightly beyond the outer beads 11 of the window frame and also slightly beyond or at least flush with a metal dividing strip 12 which extends vertically intermediate the width of each stile and divides the stile into inner and outer tracks 13 and 14 to receive the sashes 6 and 8. The dividers 12 are each formed from a metal strip folded longitudinally, as shown in Figure 8, to provide side arms or wings 15 embedded in grooves formed in the stiles and very firmly holding the dividing strips in place when securing screws are applied. It should also be noted that each dividing strip defines a channel 16 which extends vertically for the full height of the window frame and slidably receives guides 17 and 18 carried by the meeting ends of the sashes and projecting transversely from opposite sides thereof, as shown in Figure 9, for engagement in the channels of the two dividers, as shown in Figure 8. By this arrangement, the sashes will be guided in their sliding movement as they are shifted vertically in the window frame.

The sashes are to be securely but detachably connected with the sash cords and, therefore, each sash carries at its lower corners, plates 19 which are firmly secured by screws against under edge faces of the sashes and provided with hooks 20 which project outwardly from sides of the sashes into the tracks 13 and 14. The sash cords 4 have their outer ends anchored in sockets 21 of cross bars 22 which extend transversely of the tracks 13 for engagement by the hooks 20 of the lower sash and the sash cords 4' have their outer ends secured in sockets 23 carried by a sleeve 24 through which a cross bar 25 extends, and referring to Figure 13 it will be seen that each of the sleeves 24 has a lower extension or bearing 26 in which an eye 27 is swiveled. By having the sleeve 24 provided with the eye 27, the upper sash, when in a raised position, may have the sash cords detached from the hooks of its plates 19 by grasping the eyes 27 and exerting a downward pull to move ends of the cross bars out of contact with the hooks of the plates and then shifting the cross bars toward the stiles to a position in which they can bear against lower ends of the shields 10 when again allowed to move upwardly. The cross bars or attaching members carried by the weight cords will thus be out of contact with the hooks of the corner plates carried by the upper sash and the upper sash will be released from its weight cords and may be slid downwardly to a lowered position for removal. Lower ends of the shields 10 are slotted, as shown at 28, in order to make it easier to move the cross bars

25 into and out of engagement with the hooks of the corner plates carried by the upper sash. Each of the shields 7 is formed at its lower end with an extension 29 having side wings 29' through which screws are passed to secure it against the face of the track 13 and, by referring to Figure 12, it will be seen that each of these extensions or shoes 29 travels in a groove 30 formed longitudinally of the lower sash, as shown in Figure 5, and is disposed over the cross bar 22 so that when the lower sash is moved upwardly to its full extent, the shoes may engage the cross bars at opposite sides of the sockets 21 between the hooks 20 of the corner plates 19 of the lower sash and thus detach the sash cords from the lower sash, as shown in Figure 6.

Under normal conditions, the two sashes are not to be moved their full extent in the window frame and, therefore, the upper sash carries stops 31 in its upper corner portions which are slidably mounted in casings 32. A single stop may be used if so desired. The casings 32 are countersunk in the side edge faces and inner faces of the sash and secured by screws passed through bordering flanges 33, and in order to limit outward movement of the stops, each has been formed with an enlarged inner portion 34 which limits its outward movement. A spring strip 35 which extends longitudinally in each casing 32, bears against a side of the stop carried thereby to frictionally resist sliding movement of the stop, and in order to permit the stops to be easily drawn outwardly to an extended position after being pushed inwardly to a retracted position, each stop is formed with a groove 36 close to its outer end. It will thus be seen that under normal conditions the stops 31 will be disposed in extended positions where they will make contact with the upper edge of the lower sash and limit sliding movement of the sashes. When the sashes are to be removed, the stops will be shifted inwardly to a retracted position by pressure applied to their outer ends and the sashes may then be slid to their full extent in the window frame and the lower sash shifted upwardly to a fully raised position in which its guides 17 may be moved through the passages 37 near the upper ends of the dividers 12 and the upper sash shifted to a fully lowered position in which its guides 18 may be shifted through the passages 38 of the divider. It will thus be seen that when either sash is removed it will be shifted inwardly of the room instead of outwardly and will not be liable to be torn from a person's grip by strong wind or fall out of a window if it should accidentally slip with resulting likelihood of breaking the sash and injuring a person upon whom it might fall. The stop is so located with respect to the upper end of the upper sash that under normal conditions the lower sash cannot be moved upwardly to a position in which its guides 17 can pass through the cut outs or passages 37 and the upper sash cannot be moved downwardly to a position in which its guides 18 can be moved through the passages 38. Therefore, there is no danger of the sashes moving out of the tracks 13 and 14 unless it is intended to have them do so for purposes of removal.

In order to assist in retaining the sashes in the tracks 13 and 14 and not only guide their sliding movement but prevent wind and dust blowing inwardly into a room between the sashes and the frame, there has been provided metal strips 39 and 40 and companion strips 41 and 42, 75

The metal strip 39 is secured flat against the outer head 11 with a flange 43 of this strip embedded in the head and a doubled portion 44 of the strip engaged between the upper sash and the doubled portion or lip 45 of the strip 41 which is secured against the outer face of the upper sash with its flange 46 embedded in the sash. The strip 40, which is similar in construction to the strip 39, is secured against the stile 2 with its flange 47 embedded in the stile and its doubled lip 48 engaged between the lower sash 6 and the doubled lip 49 of the strip 42; the strip 42 being secured against the inner face of the lower sash with its flange 50 embedded in the sash. It will thus be seen that all of these strips will be very firmly secured, and the companion strips will have overlapped lips which will serve very effectively to guide sliding movement of the sashes and prevent wind and dust from blowing into a room between the sashes and the frame. Therefore, the strips serve as combined guides and weather strips. The lips or flanges 48 of the strips 40 terminate in spaced relation to the upper ends of these strips, as clearly shown in Figures 1 and 14, and also in Figures 3 and 4. Therefore, when the lower sash is shifted upwardly to a fully raised position for removal, the lower edge of the sash will be above the upper ends of the flanges 48 and the lower sash may be removed from the frame, as shown in Figure 3. When the stops 31 are in an extended position to limit upward movement of the lower sash, the lower end of the lower sash will be prevented from moving upwardly to a position above upper ends of the flanges 48 and these flanges will remain in position between the sash and the flanges 49 of the strips 42 and guide sliding movement of the lower sash.

In Figures 15 through 19 there has been illustrated a modified construction. In this embodiment of the invention, the frame 51 is quite similar in construction to the frame 1, but the stiles 52 are formed with grooves 53 which correspond to the grooves 5 and extend the full height of the frame instead of terminating at the openings in which the pulleys 54 are mounted. Shields 55, which are formed of metal and are U-shaped in cross section, extend from the upper end of the frame to a point substantially corresponding to the position of the lower ends of the shields 7, and below the lower ends of the shields 55, plates 56, which serve as detaching members for the hooks 57 carried by the weight cords 58, are secured to the stile in crossing relation to the grooves. The hooks 57 travel in the portions of the grooves 53 between the plates and lower end of the frame as the lower sash 59 is raised or lowered, and upon referring to Figure 18 it will be seen that the lower sash carries plates 60 which are secured in countersunk seats formed in side edge faces of the sash by screws 61. The seats in which the plates 60 are secured have their lower end portions deepened to form pockets 62 to receive the bills of the hooks 57, and it will be readily understood that when the lower sash is set in place and slid downwardly, the plate 60 will engage the hooks 57 to connect the weight cords with the sash. Under normal conditions, the sashes will be prevented from sliding the full height of the frame by the stop carried by the upper sash and, therefore, the lower sash may not become detached from the hooks of the weight cords but when the stops are retracted to permit the sash to be shifted upwardly to its full extent, the lower end of the sash will move upwardly above the lower edges of the plates 56, which will

then be engaged by the hooks 57, and thus cause the hooks to move out of engagement with the plates 60 when the sash is fully raised. The outer sash is mounted in the manner previously described and, therefore, has not been shown in place.

When this improved window is installed, it is built into a wall in the usual manner and when the sashes are in place and connected with the weight cords, they may be raised and lowered without becoming detached from the cords and will be guided in their sliding movement and be limited in this movement by engagement of stops 31 with the upper edge face of the lower sash. When it is desired to remove the sashes, in order to wash the window panes, apply blinds, or set screens in place, or make repairs, the stops 31 are pressed upon to move them to a retracted position. The lower sash is then slid upwardly to a fully raised position in which its lower edge will be disposed above upper ends of the flanges or lips 48 of the strips 40 and the guides 17 will be disposed at the passages 37. As the hooks of the corner plates 19 of the lower sash pass the lower end of the detachers 29, the cross bars 22 of the sash cords will be engaged by the detachers to stop upward movement of the cross bars and the hooks 20 will then move upwardly out of engagement with the cross bars and leave the cross bars bearing against the detachers. Therefore, the lower sash will be automatically detached from its sash cords and the lower portion of the lower sash may then be swung inwardly into a room over the flanges 48. The sash will then be firmly grasped and the guides 17 moved through the passages 37 out of the channel 16 of the divider 12. The same operation takes place in the form shown in Figures 15 through 19.

After the lower sash has been removed, the eyes or rings 27 of the weight cords for the upper sash will be grasped and pull exerted to move the cross bar 25 downwardly out of contact with the hooks of the corner plates of the upper sash, after which the cross bars will be shifted toward the stiles 2 to engage under lower ends of the strips or shields 10. The upper sash may then be slid downwardly to a fully lowered position in which its guides 13 will be disposed in position to pass through the passages 38 of the divider 12 and the lower sash may be swung inwardly from its upper end into the room, as shown in Figure 4. It will thus be seen that in both instances the sashes will be moved into a room as they are withdrawn from the frame and there will be no danger of the sashes falling out of a window. The window panes can then be very easily cleaned upon their outer, as well as inner faces, and the sashes repaired. This also permits the sashes to be easily removed if a window pane should be broken and a new pane set in place.

Having thus described the invention, what is claimed as new is:

1. In a window construction, a frame, upper and lower sashes slidable vertically in said frame, a divider between the sashes carried by the frame and defining tracks for the sashes, weight cords detachably engaged with said sashes, guides carried by said sashes and slidably engaged with said divider, the guides being movable out of engagement with the divider and the sashes being normally held against movement to a position in which the guides may be moved out of engagement with the divider, and cooperating strips carried by the frame and sashes for forming close

joints between the same, the strips of the sashes moving out of engagement with the strips of the frame when the sashes are in position for removal.

2. In a window construction, a frame, a divider 5 extending vertically in the frame at sides thereof and defining inner and outer tracks, upper and lower sashes slidable in said tracks and having guides engaging said divider and movable out of engagement therewith only when the sashes are 10 in predetermined vertically adjusted positions, and sash cords detachably engaged with said sashes and adapted to be disconnected from the sashes prior to movement of the sashes into position for movement of the guides out of engagement 15 with the divider when removing the sashes from the frame.

3. In a window construction, a frame, beads extending vertically in the frame at sides thereof and defining inner and outer tracks, said beads 20 being channeled and having inner walls of the channels formed with passages adjacent upper and lower ends of the beads, upper and lower sashes slidable in said tracks, guides extending from opposite sides of said sashes and slidably 25 engaged in the channels of said beads and movable through said passages to permit removal of the sashes from the frame, and abutments carried by one sash for engaging the other sash and normally preventing movement of the sashes into 30 position for movement of the guides through the passages, said abutments being shiftable out of position to limit sliding movement of the sashes.

4. In a window construction, a frame, dividers 35 extending vertically at sides of the frame and defining tracks, upper and lower sashes slidable in said tracks, strips for engaging inner and outer faces of said sashes extending vertically in said frame and terminating intermediate the depth of the frame, said sashes being movable to a position 40 for movement past the dividers and strips out of the frame, weight cords having attaching members at their ends, grapples carried by said sashes for detachably engaging the attaching members of said cords, and means carried by the sashes in 45 the tracks for engaging the attaching members of the cords when detached from the sashes.

5. In a window construction, a frame, dividers 50 extending vertically at sides of the frame and defining inner and outer tracks, upper and lower sashes slidable in said tracks, weight cords having attaching members at their ends, shields for said cords having means at their lower ends for en-

gagement by the attaching members when the said members are detached from the sashes, and means for guiding sliding movement of said sashes slidably engaging said dividers and movable 5 with the sashes into position for movement out of engagement with the dividers whereby the sashes may be withdrawn from the frame.

6. In a window construction, a frame, dividers extending vertically at sides of the frame and defining inner and outer tracks, upper and lower 10 sashes slidable in said tracks and having guides slidably engaging said dividers and movable with the sashes into position for movement out of engagement with the dividers whereby the sashes may be withdrawn from the frame, weight cords, 15 shields for said cords mounted in said tracks and defining passages for the cords, cross heads at ends of said cords engageable with lower ends of said guides when out of engagement with said sashes, and plates secured to corner portions of 20 said sashes and having hooks for engaging over the cross heads and detachably connecting the weight cords with the sashes.

7. In a window construction, a frame, dividers 25 extending vertically at sides of the frame and defining inner and outer tracks, sashes slidable in said tracks, side portions of the frame being grooved, sash cords movable through said grooves and having hooks at their ends, shields for said 30 cords seated in said grooves and terminating intermediate the height of the frame, plates secured in said tracks in crossed relation to the grooves under the shields for engagement by the hooks when detached from the sashes, and plates carried 35 by corner portions of the sashes for engaging the hooks and connecting them with the sashes.

8. In a window construction, a frame having vertically extending tracks at sides thereof and channels between the tracks, inner walls of the channels being formed with passages adjacent 40 their upper and lower ends, upper and lower sashes slidable in said tracks, guides extending from opposite sides of the sashes and slidably engaged in the channels and movable through the passages to permit removal of the sashes 45 from the frame, and means for normally preventing movement of the sashes into position for movement of the guides through the passages, said means being movable out of position to limit 50 sliding movement of the sashes.

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