

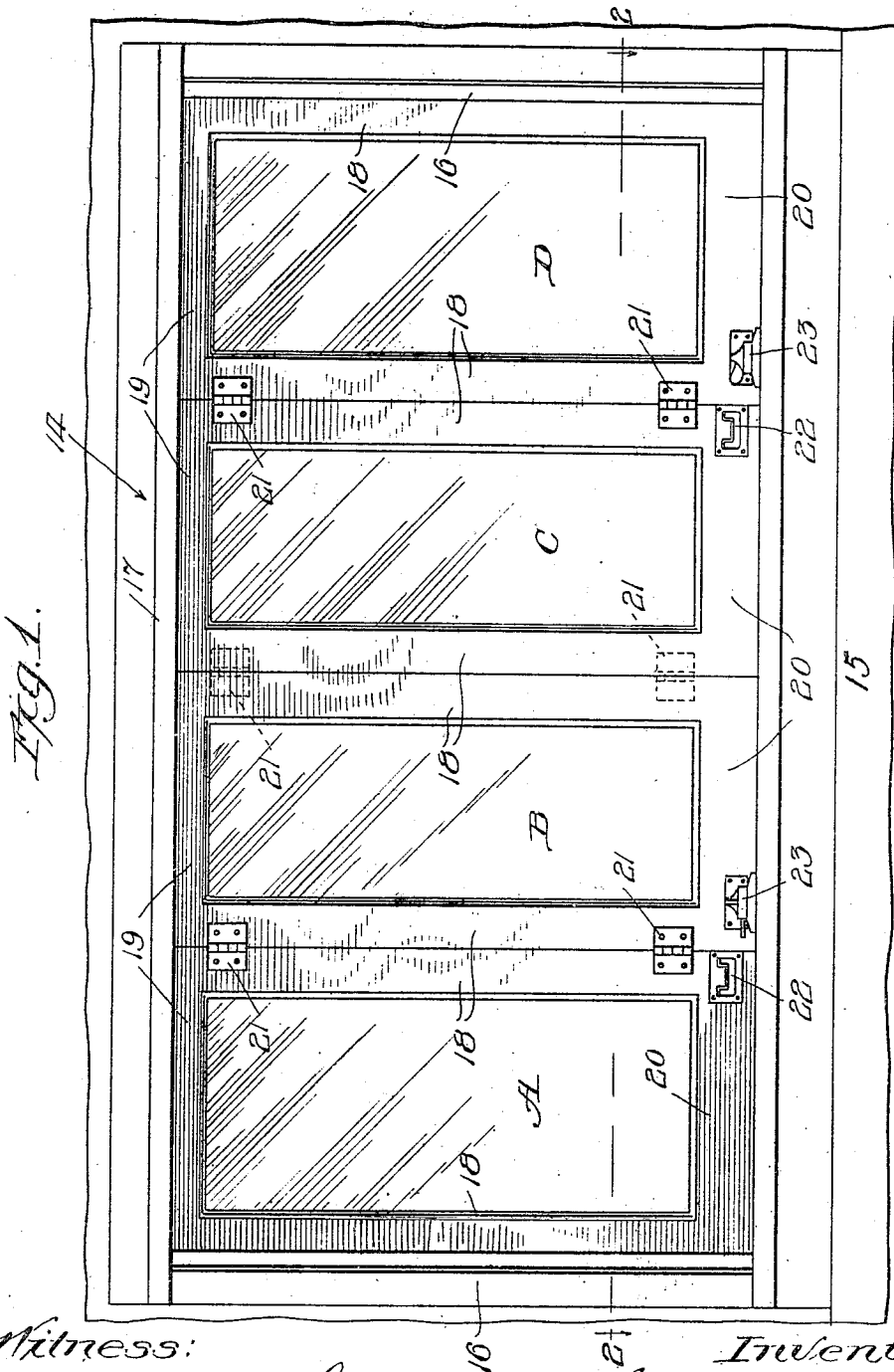
W. A. SCHOENING & J. PACHYNSKI,
WINDOW.

APPLICATION FILED AUG. 24, 1916.

1,245,042.

Patented Oct. 30, 1917.

5 SHEETS—SHEET 1.



Witness:

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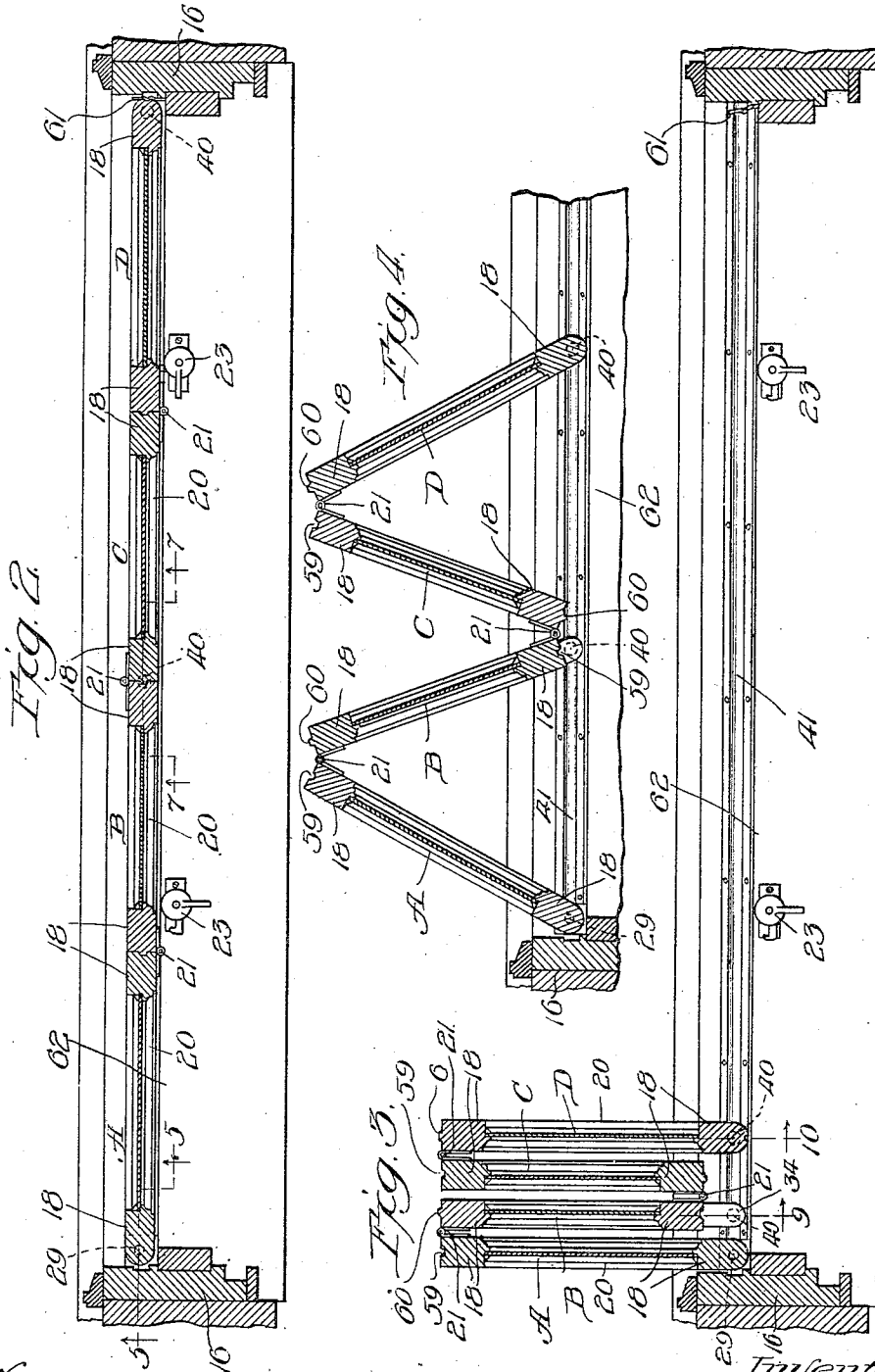
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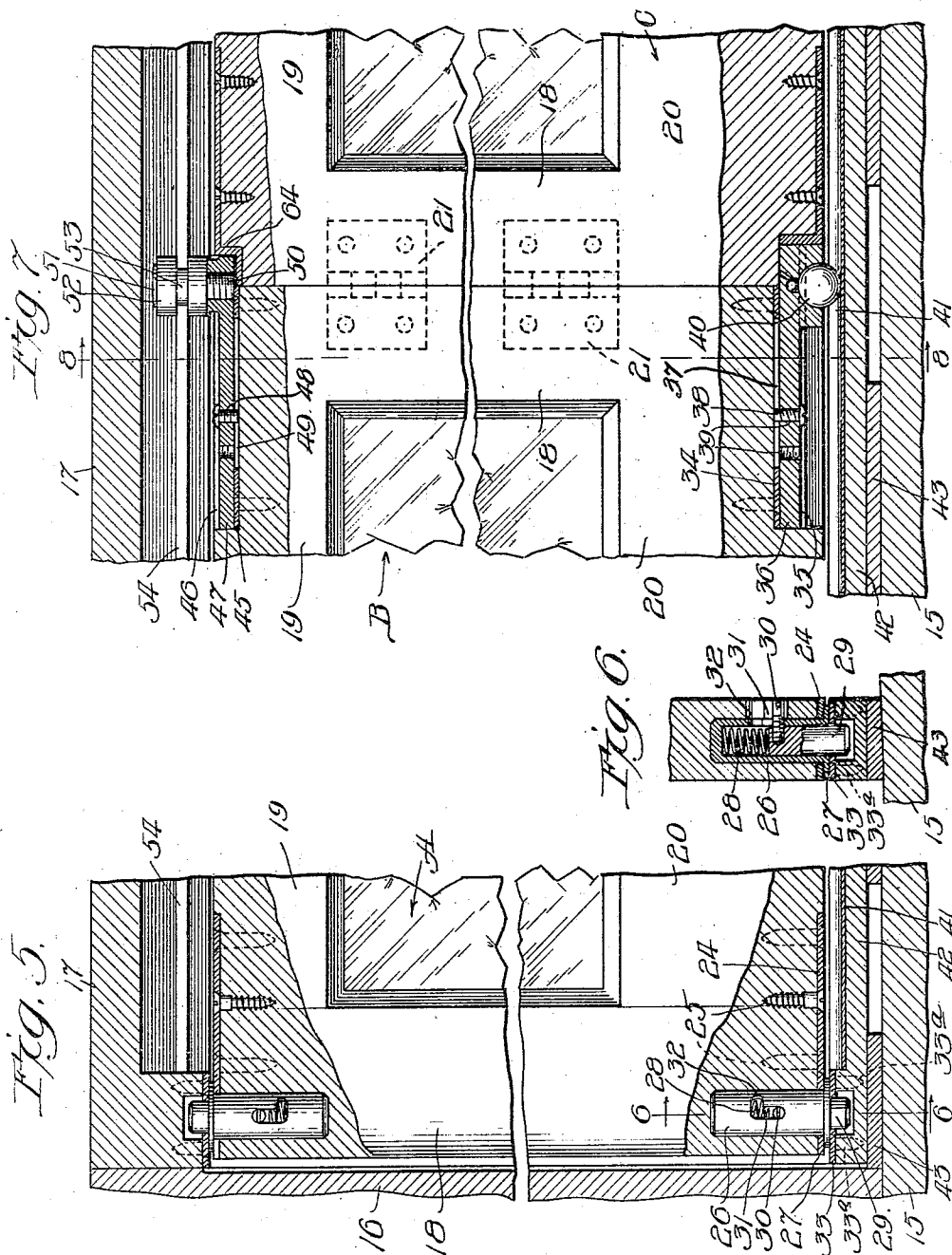
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5 SHEETS—SHEET 3.

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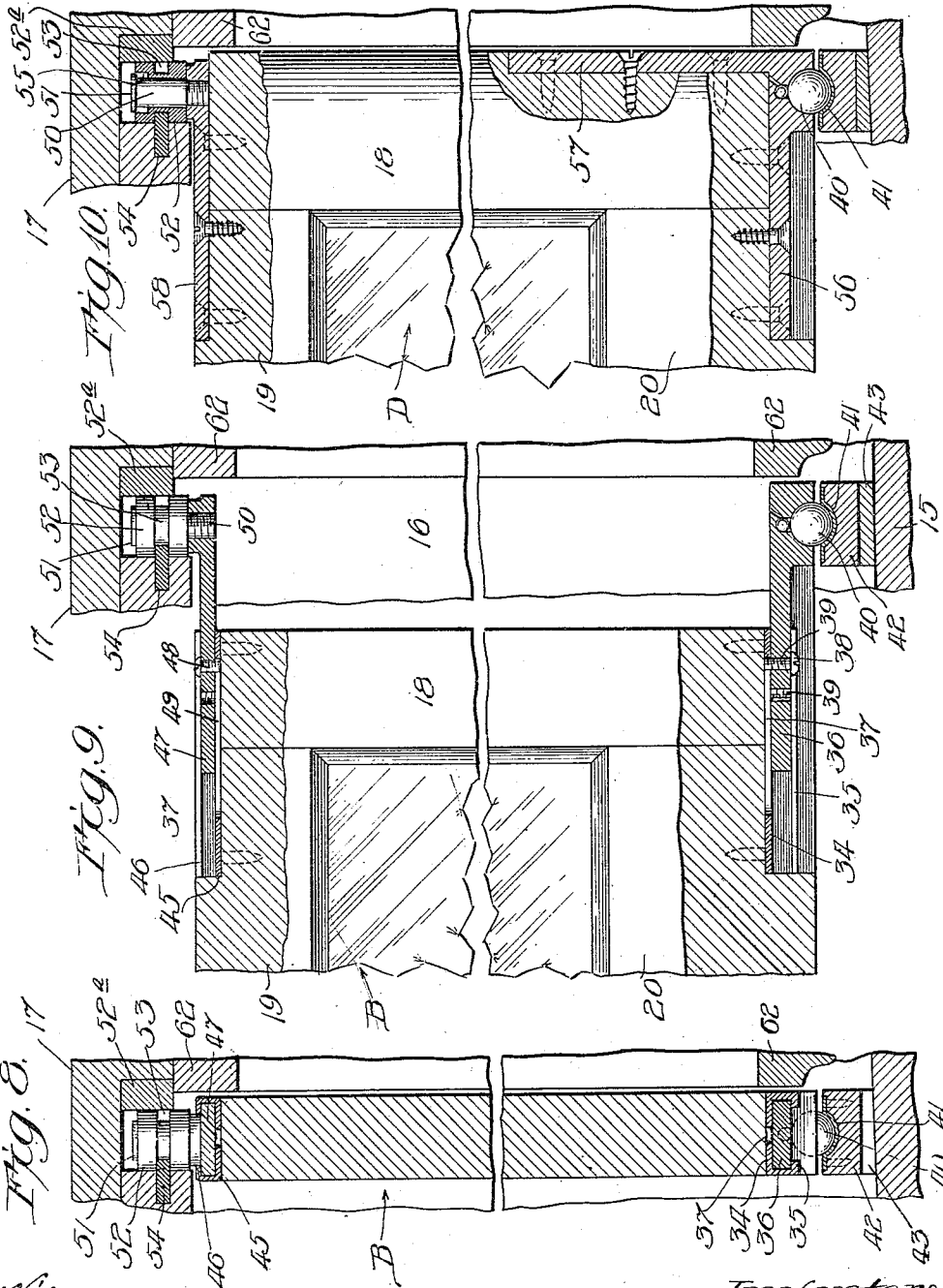
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5 SHEETS—SHEET 5.

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Fig. 11.

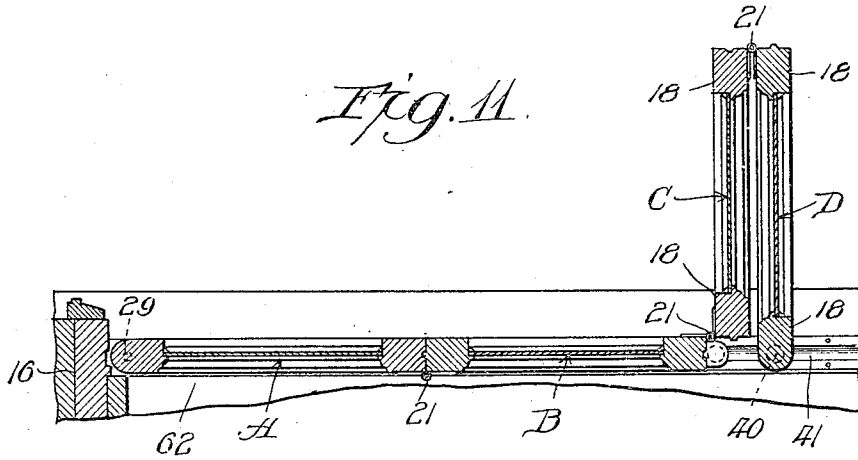


Fig. 12.

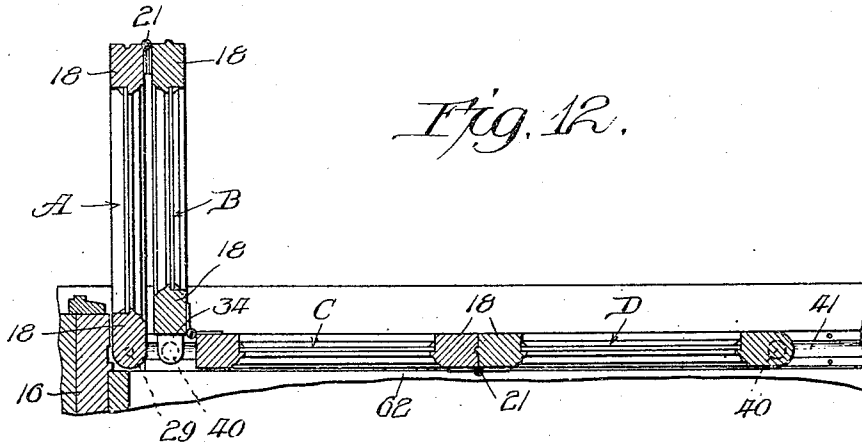
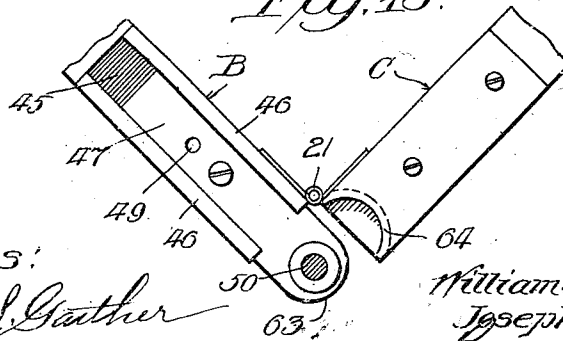


Fig. 13.



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UNITED STATES PATENT OFFICE.

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WINDOW.

1,245,042.

Specification of Letters Patent.

Patented Oct. 30, 1917.

Application filed August 24, 1916. Serial No. 116,614.

To all whom it may concern:

Be it known that we, WILLIAM A. SCHOENING and JOSEPH PACHYNSKI, both citizens of the United States, residing at Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Windows, of which the following is a specification.

This invention relates to a window or door of the multifold type, being particularly concerned with the mountings for the individual window or door sections, and the means by which such sections are guided in their movements.

It is to be noted that the present improvement is applicable to windows or doors composed of two or more sections arranged to be folded upon each other for the purpose of affording a wide passage. In explaining our invention reference will be made throughout the specification and drawings to a window construction only, although it should be borne in mind that substantially no modifications are required in order that the same invention may be adapted for use with folding doors.

The present window construction has for its objects numerous purposes; it is simple and inexpensive to build and install; it positively guides and securely holds the window sections against accidental displacement; it permits the window to be opened or closed without binding of the parts and without undue friction; it presents a wide clearance when opened, without projecting the window sections inwardly or outwardly to any considerable extent; and it provides a construction which is adaptable to two or more window sections, as may be required. These and other objects are attained by the present invention, as will more fully hereinafter appear from the specification and claims, and from the accompanying drawings, in which:—

Figure 1 is a view in elevation showing in closed position a multiple window consisting of four sashes;

Fig. 2 is a horizontal section taken on line 2—2 of Fig. 1;

Fig. 3 is a section similar to Fig. 2, showing the window in open position;

Fig. 4 is a view similar to Figs. 2 and 3, showing the window in partially open position;

Fig. 5 is a detail, partly in section, taken on line 5—5 of Fig. 2, showing the upper and lower mountings for the pivoted window sash;

Fig. 6 is a sectional detail of the lower window mounting, taken on line 6—6 of Fig. 5, looking in the direction of the arrows;

Fig. 7 is a detail, partly in section, taken on line 7—7 of Fig. 2;

Fig. 8 is a sectional detail of the upper and lower roller mountings for the window sashes, taken on line 8—8 of Fig. 7;

Fig. 9 is a sectional view, similar to Fig. 8, taken at right angles thereto;

Fig. 10 is a sectional view, similar to Fig. 9, of the roller mounting for the end window sash;

Fig. 11 is a horizontal section looking upon a portion of the window sill, and showing certain of the window sashes manipulated to partially open the window;

Fig. 12 is a view similar to Fig. 11, showing other of the sashes manipulated to partially open the window; and

Fig. 13 is a fragmentary plan view of two adjoining window sashes, showing the slide plate and bumper block.

The window of our invention is shown comprehensively in Fig. 1, and may consist of a plurality of sections or sashes, say four in number, which are designated as A, B, C, and D. These sashes are arranged within a suitable frame 14, having a sill 15, side jambs 16, and a head 17. Each of the window sashes is constructed substantially alike, with stiles 18 and top and bottom rails 19 and 20, respectively. Hinges 21 serve to connect together the window sashes and to permit the folding action which will presently be described. We have also shown handles 22 which preferably should be inset or countersunk so as not to project appreciably beyond the window sash to which they

are secured. Suitable locks 23 for holding the window sashes in place may also be secured to the sill 15 in position to engage with the window sashes, as best shown in Figs. 1, 2, and 3.

The window sash A is fixedly hinged to one side of the frame 14. For the purpose of enabling this sash to be swung either inwardly or outwardly and for economy in space, we prefer to use mountings at the upper and lower ends of the window which are secured to the head and sill respectively of the frame. As these mountings are substantially alike, a description of the base mounting will be sufficient. This mounting consists of a plate 24 countersunk and secured to the lower edge of the lower rail 20 as by means of screws 25. Through an opening near the end of this plate a sleeve 26 is extended and countersunk within the rail, a flange 27 on the end of the sleeve lying exteriorly upon the plate. Within the sleeve a spring 28 is placed and arranged to engage with a pivot pin 29. A locking pin 30 which may be threaded transversely into the pivot pin 29 extends through a slot 31 formed in the sleeve wall and in the sash as well, this slot being vertically disposed and having a horizontal extension 32 at its upper end. The locking pin may be seized to lift the pivot pin against the action of the spring 28 and be shifted laterally to the horizontal portion of the slot 31 to lock the pivot pin in inoperative position. By this operation the window sash A may be readily installed within, or removed from, its mounting in the frame. A plate 33 is secured to the sill by such means as screws 33^a, and is provided with an opening through which the projecting end of the pivot pin may pass. The flange 27 which lies exteriorly upon the plate 24 bears against the plate 33 to hold the window sash in spaced relation from the sill. The window sash is thus free to be swung either inwardly or outwardly with respect to the frame 14 with a minimum of friction. As has been previously noted, the pivotal mounting provided at the upper end of the sash A is similar to that which is used at its base, so that a detailed description of the upper mounting is unnecessary.

As appears clearly from Figs. 1 to 4 inclusive, the window sashes A, B, C, and D are hinged together so as to be capable of folding into compact relation at one end of the window frame. With the exception of sash A, none of the window sashes are fixedly pivoted within the window frame. In order, however, that the several window sashes may be properly supported, and that their movements may be properly guided, we have provided supports on the sashes B and D at their upper and lower ends which will now be described.

Referring particularly to Figs. 8 and 9, the top and bottom sliding supports for the section B are shown. The bottom support consists of a U-shaped guideway 34 secured to the lower rail of the window section and inset therein as shown, flanges 35 being provided to hold within the guideway a slide plate 36. The sliding limits of the plate 36 are determined by a slot 37 formed in the guideway within which is projected the end of a pin 38 threaded into an opening 39 in the plate 36. In the construction shown two such openings 39 are provided to permit of an adjustment, if desired, in the slide plate. The number of such openings is to be determined according to the number of adjustments desired. The end of the slide plate which is preferably rounded (see Figs. 3, 4, and 13) is shaped to retain a revolvable ball 40 arranged to travel within a grooved plate 41 secured upon a strip 42 which may, if preferred, be supported upon the window sill by blocks 43 spaced apart at intervals. The foregoing description should make it clear that the ball 40 can travel only in a straight line within the grooved plate 41, in consequence of which the plate 36 will be caused to slide within the guideway whenever the window section is moved into open or closed position.

At the upper end of the section B a second U-shaped guideway 45 is provided, having flanges 46 to retain within the guideway a slidable plate 47. A screw or pin 48 is also entered through the plate 47 and disposed within a slot 49 in the guideway to determine the limits of movement of the slide plate. At its extremity a pin 50 is threaded into the slide plate, being provided with a head 51. Upon this pin a roller 52 is mounted having an annular grooved central portion 53 therein. A guide rail 54 extending horizontally across the window frame is arranged to lie within the grooved portion of the roller 52 to hold the same on one side in a fixed line of travel. On the other side a stop 52^a is arranged to engage with the roller, thus providing in effect an inverted U-shaped guideway within which the roller may travel. As appears best in Fig. 10 an annular recess 55 is formed in the upper portion of the roller within which the head 51 of the pin may enter, if necessary, to permit of limited vertical movements of the window section without binding of the parts. The purpose of this is to compensate for the variations in the position of the top rail of the window sash, such variations naturally arising through swelling of the wood and other causes.

The window sash C is hinged at one end to the sash B, and at the other end to sash D, so that no further support for the sash C is required. Sash D, however, is supported

at its upper and lower ends by means of supports resembling those provided for sash B, but differing in this respect: The lower support consists of a plate 56 fixedly secured to the lower rail of the window and having an upturned end portion 57 which may be inset and secured in the manner shown (see Fig. 10). This plate has no sliding motion whatever, but in other respects is similar to the plate provided for section B, in that it carries a ball 40 which travels within the same grooved plate 41 as does the ball in the plate 36. Likewise the support secured to the upper rail of the sash D consists of a plate 58 fixedly secured thereto, and carrying a pin and roller 50 and 52 respectively, which latter engages with the same guide rail 54 as does the roller on the slidable plate 47.

As appears best in Figs. 2 and 3, the outer edges of the stiles of each of the sashes may be provided with a groove 59 or a tongue 60 arranged to cooperate, when alined, for the purpose of making a tight joint between the sashes. Likewise spring moldings 61 may be arranged upon the jamb of the frame to be engaged by the sashes D and A when the window is closed. Upon the sill and head of the frame stops 62 may also be arranged so as to confine the swinging movements of the window sashes to an outward direction, or, if preferred, may be so arranged as to confine such movements to an inward direction. By such means as these, the spaces around the window edges are covered and protected against the entrance of rain, wind, etc.

In Figs. 11 and 12, we have shown two possible positions for the window sashes. In these positions, the window is not entirely but only partially open. As appears in Fig. 11, the sashes A and B remain in normally closed position, while the sashes C and D are swung outwardly to open up substantially one-half of the window sash. In Fig. 12, the sashes A and B alone have been outwardly swung, while the sashes C and D have been made to slide into the position shown. The amount of clearance afforded by the window, when in either of the positions shown in Figs. 11 and 12, is substantially the same. In order to fully realize the advantages of our invention, the sashes at the window extremities should be slightly wider than the intermediate sashes. The difference in width would be represented approximately by the thickness of the window sash, plus the clearance space between two sashes when folded into parallel relation. For instance, if the sash is $1\frac{3}{8}$ " in thickness and the clearance between the sashes when folded together amounts to $\frac{5}{16}$ ", then the outside sashes should be $1\frac{11}{16}$ " wider than the remaining sashes. The reason for this is readily apparent by an inspection of Figs.

11 and 12, where two sashes of unequal width are shown folded upon each other. Without the difference in sash width noted, it would be impossible for the window to assume these positions.

In Fig. 13 is clearly shown the rounded extremity 63 of the upper slide plate 47. During opening of the window, the sashes B and C would assume positions such as are shown in this figure. During closing of the window, the sashes are alined, at which time a bumper block 64 secured to the sash C engages with the rounded edge 63 of the slide plate to force the same back into the guideway.

It will be noted that the present window requires for its construction a relatively few parts, some of which are interchangeable. The window may readily be installed by cutting the edges of the rails and stiles to receive the guideways, etc., and arranging upon the window frame the other parts which form the mountings for the window. It should be observed that the window sashes need not be mortised for the reception of any of these parts. The number of window sashes to which our invention is applicable may vary from two up, it being necessary merely to duplicate the mountings for each pair of sashes added.

In operation it will be found that the sashes of the present window may be moved easily without any binding. This is because of the manner in which the sashes are secured to the window frame and to each other. At least one half of the sashes are independently supported and are provided with anti-friction members to permit of an easy sliding action. For these reasons the opening and closing operations may be readily effected. The present window construction is especially advantageous in that the sashes are connected directly to each other without the intervention of mullions which obstruct light and air. Our window, when fully opened, affords a clearance substantially equal to the entire width of the frame, the only obstruction remaining being that caused by the aggregate thicknesses of the several sashes.

We claim:

1. A multifold window comprising: a frame; a plurality of sashes, not less than four, pivotally connected together; and connections between certain of the sashes and opposite sides of the frame—those with one end sash being pivotal only, those with the other end sash being pivotal and sliding, and those intermediate being pivotal and sliding and extensible, all of the connections with the frame being situated in a single plane lying substantially midway between the inner and outer faces of the sashes when in closed position, substantially as described.

2. A multifold window comprising: a frame; a plurality of sashes, not less than four, pivotally connected together; and connections between certain of the sashes and opposite sides of the frame—those with one end sash being pivotal only, those with the other end sash being pivotal and sliding, and those intermediate being pivotal and sliding and extensible, substantially as described.

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7 Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."