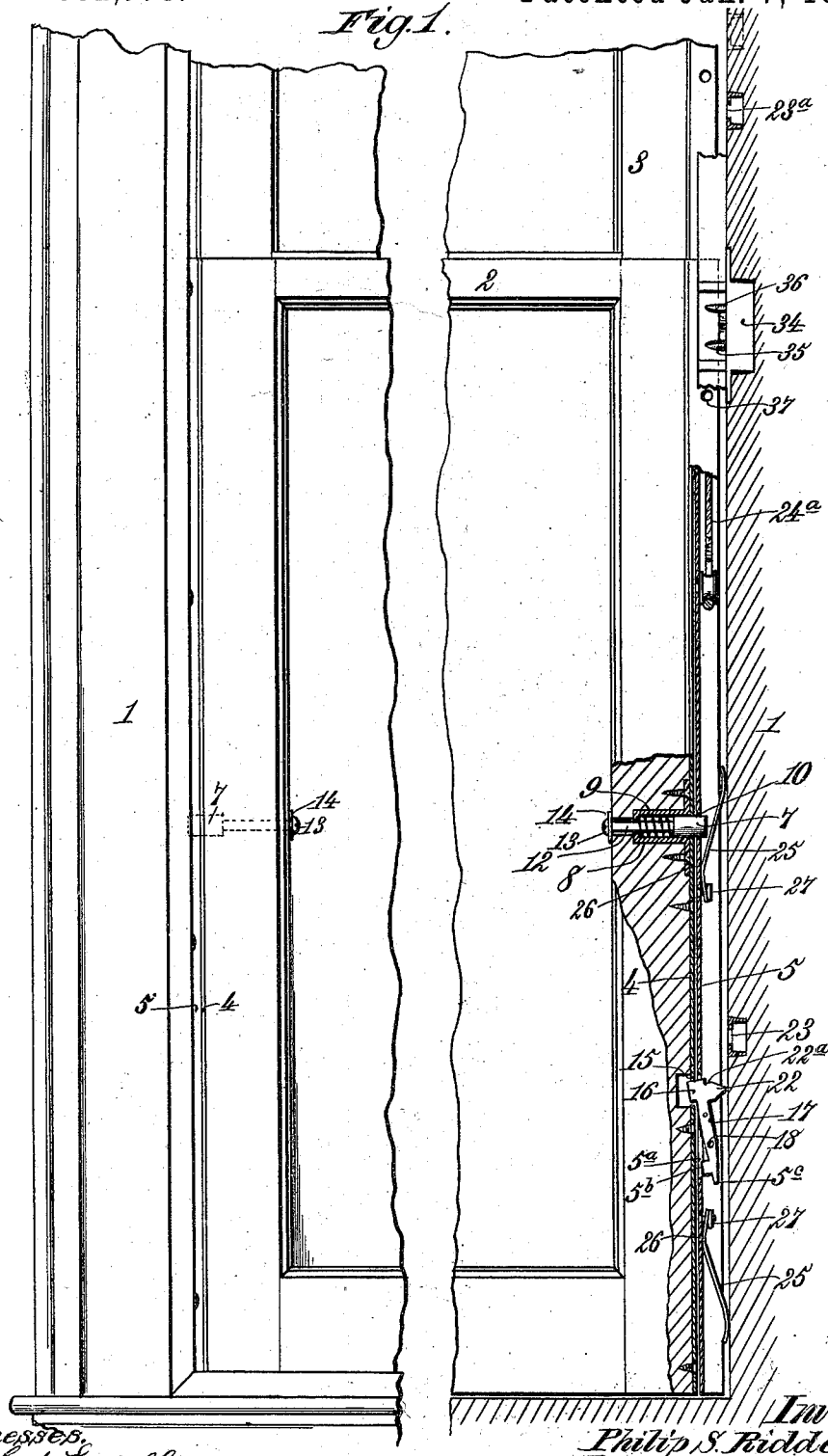
(No Model.) 3 Sheets—Sheet 1.

P. S. RIDDELLE.

REVOLVING WINDOW SASH.

No. 552,778. Patented Jan. 7, 1896.

Fig. 1.



Witnesses.
Robert Ewell.
Dennis Sumby.

Inventor:
Philip S. Riddelle.
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Atty.

(No Model.) 3 Sheets—Sheet 2.

P. S. RIDDELLE.

REVOLVING WINDOW SASH.

No. 552,778. Patented Jan. 7, 1896.

Fig. 2.

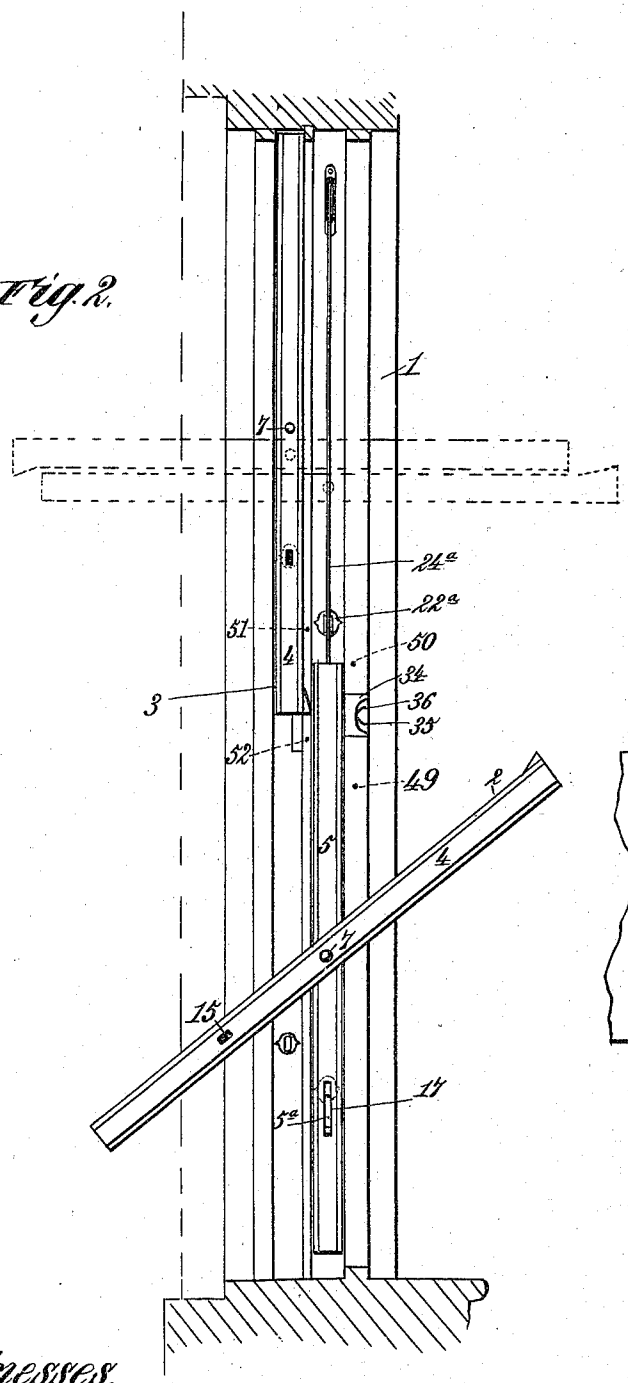
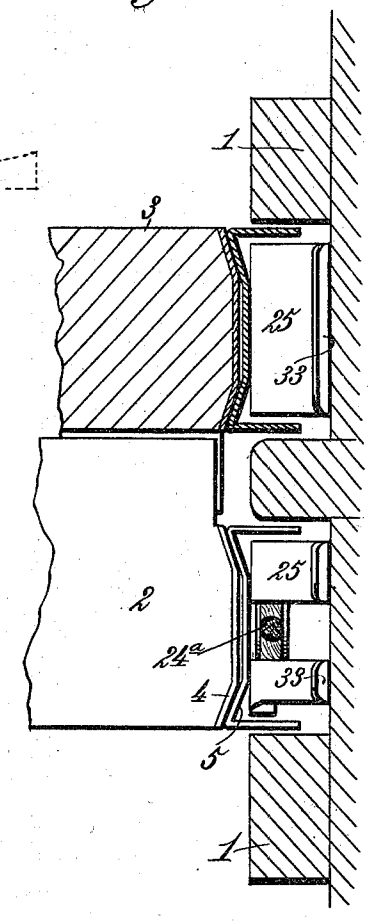


Fig. 3.



Witnesses.
Robert Everitt.
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(No Model.) 3 Sheets—Sheet 3.

P. S. RIDDELLE.

REVOLVING WINDOW SASH.

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Fig. 4.

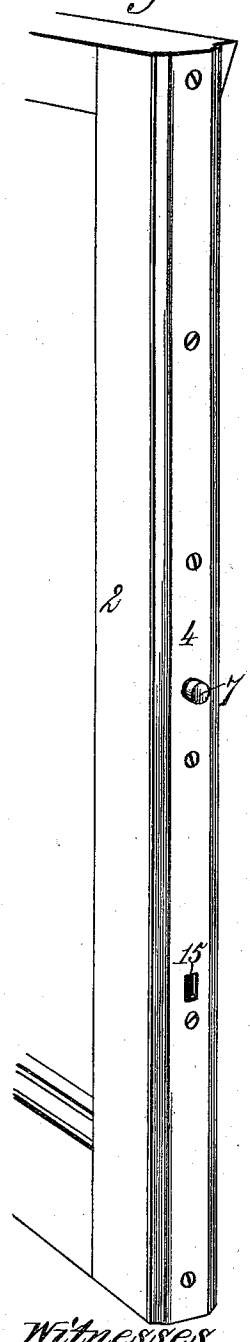

Fig. 5.

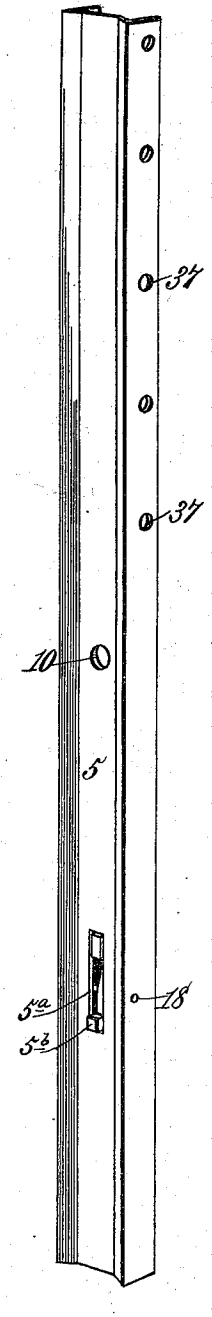

Fig. 6.

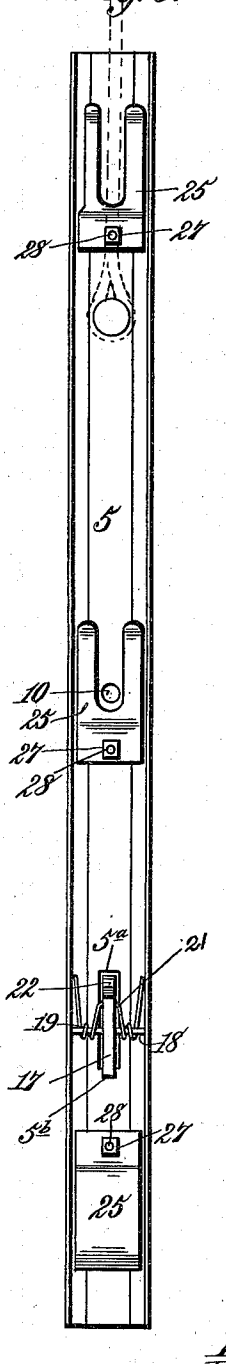

Fig. 7.

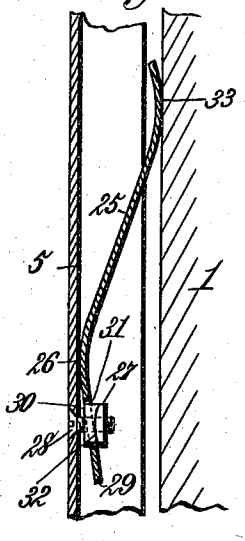

Fig. 8.

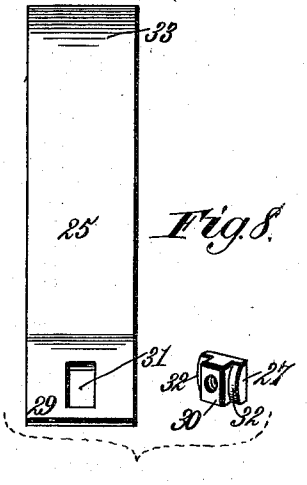

Fig. 9.

Witnesses.
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UNITED STATES PATENT OFFICE.

PHILIP S. RIDDELLE, OF WOODSTOCK, VIRGINIA.

REVOLVING WINDOW-SASH.

SPECIFICATION forming part of Letters Patent No. 552,778, dated January 7, 1896.

Application filed August 19, 1895. Serial No. 559,764. (No model.)

To all whom it may concern:

Be it known that I, PHILIP S. RIDDELLE, a citizen of the United States, residing at Woodstock, in the county of Shenandoah and State of Virginia, have invented new and useful Improvements in Revolving Window-Sashes, of which the following is a specification.

This invention relates to the revolving window-sash described and shown in Letters Patent No. 514,773, issued to me February 13, 1894, and has for its object to provide a more simple and economical construction and to improve the operation of the parts; to enable the channeled slide-bars to be made of less depth than in the prior construction; to avoid undue cutting away of the window-frame in applying the revolving window-sashes thereto; to provide new and improved automatically-operating latches for locking and releasing the sash-frames, whereby they may be locked to the channeled slide-bars and be held against rotating until the sashes are raised or lowered to certain definite positions, whereupon the sashes are automatically released and can be rotated on their pivots or bearings for cleaning or other purposes; to avoid the employment of yielding antifriction-rollers, and to provide novel, simple, and efficient springs which act to press the channeled slide-bars against the sash-frames and prevent the latter from rattling while compensating for shrinking or swelling of the sash-frames or the window-frame, and to enable the sash-frame to be easily and conveniently raised or lowered.

To accomplish all these objects, my invention involves features of construction, the combination or arrangement of parts, and the principles of operation hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a broken sectional elevation showing portions of a window-frame and of two sashes with my invention applied thereto. Fig. 2 is a sectional elevation looking at the edges of the sashes and showing one of the latter turned on its pivots or bearings at an angle to the perpendicular and also indicating by dotted lines both sashes turned approximately to a horizontal position. Fig. 3 is a detail horizontal sectional view on a slightly larger scale than the other figures to clearly illustrate the shape in cross-section of the channeled slide-bars and the wear-plates on the edges of the sash-frames. Fig. 4 is a detail perspective view of a portion of one of the sashes looking at the wear-plate secured to the edge thereof. Fig. 5 is a detail perspective view of one of the channeled slide-bars looking at the seat in which the wear-plate of the sash-frame is adapted to fit. Fig. 6 is a detail view of one of the channeled bars, looking at the interior thereof. Fig. 7 is a detail sectional view showing a portion of a window-frame and a portion of one of the channeled slide-bars with my new and improved antirattling friction-spring applied to the slide-bar. Fig. 8 is a detail plan view of the antirattling friction-spring and the nut adapted to fit a bolt or screw for securing the spring to the slide-bar, and Fig. 9 is a detail view of one of the metallic sockets applied to the jamb of the window-frame for receiving an arm or projection of the automatically-operating latches, as will hereinafter appear.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, wherein—

The numerals 1 indicate a window-frame, and 2 and 3 window-sash frames, which are adapted to be raised and lowered in perpendicular planes and to be balanced through the medium of ordinary weights or as described in my Letters Patent before mentioned. The two sash-frames are designed to be mounted and operated in the same manner, and therefore the description of my invention as applied to the lower sash-frame is believed to be a sufficient description for both sash-frames.

The sash-frame 2 is provided at each edge with a metallic wear-plate 4, which can be economically manufactured by rolling it from metal so that it will possess the cross-section form shown in Fig. 3. The wear-plates 4 are each adapted to lie in a longitudinal depression formed in the outer face of a channeled slide-bar 5, so that the wear-plates have in fact three distinct bearings against the outer face of the slide-bar for the purpose of securing an accurate and nice fitting of parts and a perfect joint which will effectually exclude dirt, dust, rain and snow. The sash-frame 2 is journaled centrally between its upper and

lower ends to opposite channeled slide-bars 5 through the medium of horizontal pivot-pins 7, preferably mounted in small metallic cases 8, inserted into the side-rails of the sash frame, as will be clearly understood by reference to Fig. 1. The pivot-pins 7 are acted upon by springs 9, located in the cases 8 and acting to press the pivot-pins outwardly into recesses or orifices 10, Fig. 5, in the channeled slide-bars, the construction and arrangement of parts being such that when the sash-frame is not locked to the channeled slide-bar, as will hereinafter appear, the sash-frame can be rotated or revolved in a vertical plane for the purpose of enabling the window glass or glasses to be cleaned or washed, or for any other purpose, such as ventilation, &c. The construction and arrangement of parts are also such that if the upper sash be lowered and the lower sash be raised, until the two sashes lie one in front of the other and the pivot-pins of one sash-frame are brought sufficiently near the pivot-pins of the other sash-frame, both sash-frames can be simultaneously rotated from a perpendicular position to any angle of inclination or to an approximately horizontal position, as indicated by the dotted lines in Fig. 2.

The pivot-pins 7 of the sash are here shown as provided with stems 12 extending to the inner edges of the side rails of the sash-frame and having heads 13 bearing against washers 14. The stems 12 may be in the form of screws screwed into the pivot-pins 7, but I do not wish to be understood as confining myself to any particular construction of pivot-pins, as obviously these devices can be materially modified without altering the spirit of my invention. In fact, the sashes can be mounted on pivot-pins substantially as shown in my patent before alluded to, but I prefer the construction shown in the accompanying drawings, in that the pivot-pins constitute in effect spring-bolts, which enable the sash to be readily removed from between the channeled slide-bars by simply placing a suitable instrument under the washers 14, retracting the pivot-pins from engagement with the orifices 10 of the slide-bars. It will be obvious that the heads of the screws 12 could be sufficiently enlarged to constitute handles for retracting the pivot-pins.

The wear-plates 4 are each secured to an edge of the sash-frame by suitable screws or otherwise, and in proximity to the lower end portions the wear-plates are each provided with an orifice or recess 15, Figs. 1 and 4, to receive the locking-head 16 of a latch 17 carried by the channeled slide-bar 5. The latch 17 is pivoted approximately central between its upper and lower ends within the channeled slide-bar through the medium of a suitable pivot 18, and on this pivot is mounted a suitable spring 19, (clearly shown in Fig. 6,) which is provided with two arms 20 bearing against the inside of the channeled slide-bar, with a loop portion 21 which engages the latch-lever at a point above the pivot 18, so that this spring constantly tends to press the upper end of the latch-lever in a direction away from the orifice or recess 15 for the purpose of automatically releasing the sash-frame from locking engagement with the channeled slide-bar whenever the arm or projection 22 on the upper end of the latch-lever registers with a metallic socket 23 driven or inserted into the jamb of the window-frame, as will be clearly understood by reference to Fig. 1.

Although I prefer to provide a metallic socket to receive the beveled arm or projection 22 of the latch-lever 17, it will be obvious that the metallic socket can be dispensed with, and the socket, recess or orifice formed directly in the jamb of the window-frame. The same remarks apply to the orifice or recess 15, as obviously the wear-plate 4 can be dispensed with, and in this event the orifice or recess to receive the locking-head 16 of the latch-lever 17 will be formed directly in the edge of the sash-frame.

The arm or projection 22 on the upper end of the latch-lever is preferably beveled to an approximate knife-edge, which bears at all times against the jamb of the window-frame and holds the locking-head 16 of the latch-lever 17 in engagement with the orifice or recess 15, except at such times as the arm or projection 22 registers with the metallic socket 23, when the spring 19 operates to spring the locking-head 16 out of engagement with the orifice or recess 15 and causes the arm or projection 22 to enter the metallic socket 23, in which position of the parts the sash-frame 2 can be rotated or revolved on its pivot-pins 7. The bevel construction of the arm or projection 22, when the latter springs into the metallic socket 23, permits the channeled slide-bar to be slid vertically to raise or lower the sash-frame if sufficient pressure be applied to the sash-frame to cause the beveled faces of the arm or projection 22 to force the latter out of engagement with the socket.

When the parts are in the position represented in Fig. 1, the sash-frame is in its lowest position and is locked to the channeled slide-bar 5 by reason of the locking-head 16 being held in the orifice or recess 15 of the wear-plate 4 secured to the edge of the sash-frame. Obviously, however, the sash-frame can be readily raised and lowered when it is locked to the channeled slide-bar, because the latter is adapted to move perpendicularly with the sash-frame, and whenever the arm or projection 22 springs into the metallic socket 23 the sash-frame is automatically released from the channeled bar and can be turned or rotated to any angle of inclination relatively to the perpendicular, or, as before stated, if both sash-frames be brought to the proper position, one in front of the other, so that the arm or projection 22 of the latch-lever 17, mounted on the channeled slide-bar 5 of the lower sash 2, lies in the socket 23^a, Fig. 1, and the beveled arm or projection of the latch on

the channeled slide-bar of the upper sash 3 lies in the proper socket, similar to socket 23 or 23^a, both sashes can be simultaneously turned or rotated to any desired angle of inclination, or to an approximately horizontal position, as indicated by dotted lines in Fig. 2.

It will be observed by reference to Fig. 5 that the channeled slide-bar 5 is constructed with a vertical slot 5^a in coincidence with the latch-lever 17 and that the locking-head 16 of this latch-lever lies in the upper end of this slot. The lower end of the latch-lever is provided with a heel-piece 5^b, which lies in the lower end portion of the slot 5^a.

When the beveled arm or projection 22 of the latch-lever 17 enters the socket 23 or 23^a, the sash-frame 2 will be released so that it can be turned or rotated, and when this is effected, and the wear-plate 4 leaves the depression in the outer face of the channeled slide-bar 5, the lower end of the latch-lever will be forced to the left, Fig. 1, so that the heel-piece 5^b will project into the depression of the channeled slide-bar and the square portion 22^a of the arm or projection 22 will fully enter into the socket 23, thereby firmly locking the channeled slide-bar against vertical movement until the sash is brought to a perpendicular position and the wear-plate 4 on the edge of the sash, in springing into the depression in the channeled slide-bar, presses back the heel-piece 5^b of the latch-lever 17 and moves the lever to such extent that the square portion 22^a of the arm or projection 22 is withdrawn from the socket 23 or 23^a, leaving, however, the beveled portion of the arm or projection 22 in the socket, so that if pressure be applied to raise or lower the sash the arm or projection 22 will ride out of the socket and thus cause the locking-head 16 to enter the orifice 15 to lock the sash to the channeled slide-bar.

The devices at the left-hand side of the sash are constructed the same as the devices shown and described with reference to the right-hand side of the sash. The upper sash is also provided with devices the same as those described with reference to the lower sash and the said devices operate in the same manner, for which reason I do not deem it necessary to enter into a detailed description of the devices of the upper sash, as their operation will be obvious to a person understanding the devices which have been described in detail.

The lower end of the latch-lever 17 is shown in Fig. 1 as provided with a depending portion 5^c, which is adapted to strike the lower end portion of the slot 5^a and thereby limit the outward movement of the lower end of the latch-lever.

In Fig. 1 the numeral 24^a indicates a portion of one of the ordinary sash-cords, which in practice is connected with a weight for balancing the window-sash. As before stated, however, I do not confine myself to any particular means for raising and lowering the sashes or for balancing the same, as the means for this purpose constitute no part of the present invention and may be variously modified.

The channeled slide-bars are each adapted to yield in a direction toward the frame or surface of the window-jamb, and to accomplish this and at the same time maintain a perfect joint connection between the depressed seats in the outer faces of the channeled slide-bars and the wear-plates 4 on the edges of the sash-frames I provide each channeled slide-bar with a series of antirattling friction-springs 25, which are in the form of spring-plates or leaf-springs and are reversely curved, one curved end of each spring being connected with the inside of the channeled slide-bar and the opposite curved end of the leaf-spring bearing like a sled-runner against the surface of the jamb of the window-frame. These leaf-springs operate to constantly press the channeled slide-bars toward the edges of the sash-frames, and whenever the latter are perpendicular a perfect joint connection between the wear-plates 4 and the channeled slide-bars 5 is secured and the sashes are prevented from rattling, while simple means are provided to compensate for shrinking or swelling of the sash-frames or of the window-frame. The arrangement of parts is also such that the sashes can be easily and conveniently raised or lowered, even if the sash-frames or the window-frame should swell.

The curved end portion 26 of each leaf-spring 25 bears against the inside of the channeled slide-bar 5, while the end of the spring which is connected with the slide-bar is offset from the latter and normally stands at some distance from the inner surface thereof. A screw 28 extends from the exterior of the slide-bar and passes through the square opening 31 in the spring, and to this screw is applied a screw-nut 27, having a square projection 30 entering the square opening 31. If the screw 28 be turned in one direction the nut 27 will be drawn down upon the offset portion 29 of the spring 25 and consequently the curved free end portion 33 of the latter will be pressed with greater force against the window-jamb and the tension of the spring will be increased. Conversely, if the screw 28 be turned in the opposite direction the pressure of the nut 27 on the end 29 of the spring 25 will be relieved, and the tension of the spring will be diminished so that it will press with less force against the jamb of the window-frame. By these simple means the tension of the spring is adjusted or varied to suit the conditions required. The nut 27 is also constructed with side flanges having curved bearing-surfaces 32 to rest against the spring and accommodate the movements of the latter when it is adjusted to vary its tension. The duplex curved shape of the spring is important, in that it provides a runner or shoe-like bearing portion 33 to traverse the jamb of the window-frame and a fulcrum

portion 26 to bear against the inside of the channeled slide-bar and to co-operate with the offset portion 29 for adjusting or varying the tension of the spring, as before explained.

The improved construction of antirattling friction-spring materially simplifies and economizes the employment of the channeled slide-bars in connection with the revolving sash and enables me to entirely dispense with the antifriction-rollers and their carrying-levers, which are described and shown in my Letters Patent hereinbefore referred to.

The sashes are designed to be locked in any desired position, either entirely closed or more or less opened, through the medium of a lock of any construction suitable for the purpose in hand, but I prefer to employ the improved sash-lock described and shown in my application for patent filed of even date herewith, Serial No. 559,763. This lock is represented by the numeral 34, which is set in a recess in the jamb of the window-frame, and the locking-arms of which are adapted to be operated by finger-pieces 35 and 36. The locking arms or devices of the lock will engage any one of a series of orifices or recesses 37, Fig. 5, formed in one of the flanges of the channeled slide-bars 5 arranged at one side of the window-frame, preferably the right-hand side, as in Fig. 1. Inasmuch as the particular means for locking the channeled slide-bars to hold the sashes in any desired position constitutes no part of the present invention, I do not deem it necessary to more fully explain the same, as the lock I prefer to employ is fully disclosed in my other application above mentioned.

From the foregoing description it will be observed that neither sash-frame can be turned or rotated until the sash and frame are lowered or raised to a certain point, so that the beveled arm or projection 22 will automatically fly into the socket 23 or 23^a for disengaging the locking-head 16 from the orifice or recess 15. Inasmuch as the latch-levers 17 and the sockets 23 and 23^a of both sashes are invisible when the invention is in practicable use, it is advisable to provide some simple means for indicating to a person operating the window-sash when each sash is in that position which enables it to be turned or rotated. This may be accomplished through the medium of any indicating marks, signs or other devices, but a very simple means for accomplishing the result consists of indicating-marks, as at 49, 50, 51 and 52, as best seen in Fig. 2. When the lower sash is slightly raised so that the arm or projection 22 springs into the socket 23, Fig. 1, the upper edge of the lower sash will be coincident with the indicating-mark 50. When the lower sash is raised to the upper portion of the window-frame and the lower edge of the sash-frame is coincident with the indicating-mark 49, the parts are again in position, when the sash-frame can be turned or rotated. When the upper sash is lowered slightly, so that its lower edge is coincident with the indicating-mark 52, the upper sash can be turned or rotated, and when the upper sash is lowered to the lower portion of the window-frame and the upper edge of the sash-frame coincides with the indicating-mark 51 the upper sash can be turned or rotated in the lower portion of the window-frame. If both sashes are in their lower position and the upper edge of the lower sash-frame coincides with the indicating-mark 50 and the upper edge of the upper sash coincides with the indicating-mark 51, both sashes can be simultaneously turned or rotated in the lower portion of the window-frame. If both sashes are raised, so that the lower edge of the upper sash coincides with the indicating-mark 52 and the lower edge of the lower sash coincides with the indicating-mark 49, both sashes can be simultaneously turned or rotated in the upper part of the window-frame, as indicated by dotted lines, Fig. 2.

The lock indicated by the numeral 34 should be so constructed and so arranged that it only engages and locks the channeled slide-bars when the beveled arms or projections 22 of the latch-lever 17 are not engaged with the sockets or recesses in the jamb of the window-frame. This is easily accomplished by properly locating the orifices 37, Fig. 5, of the channeled bars.

Having thus described my invention, what I claim is—

1. The combination with a slide-bar and a sash-frame pivotally mounted on the slide-bar, of a latch carried by the slide-bar and adapted to engage the sash-frame and hold it locked to the slide-bar, and means, substantially as described, for causing the latch to automatically move out of engagement with the sash-frame when the latter and the slide-bar reach a certain point in their ascending or descending movements.

2. The combination of a slide-bar, a sash-frame pivotally mounted on the slide-bar, a latch carried by the slide-bar, adapted to engage and lock the sash-frame and having an arm or projection, and a window-frame having a recess to receive the said arm or projection of the latch and into which said arm or projection springs when the sash-frame and the slide-bar reach a certain point in their ascending or descending movements.

3. The combination of a slide-bar, a sash-frame pivotally mounted on the slide-bar, a latch carried by the slide-bar and adapted to engage and lock the sash-frame, a spring acting upon the latch and tending to move the same out of engagement with the sash, and a window-frame acting upon a part of the latch to hold it in engagement with the sash-frame and provided with a recess into which a part of the latch springs when the sash-frame and the slide-bar reach a certain point in their ascending or descending movements.

4. The combination with a slide-bar and a sash-frame pivotally mounted on the slide-bar, of a pivoted, swinging latch mounted on

the slide-bar and adapted to engage and lock the sash-frame thereto, and means, substantially as described, for causing the latch to swing on its pivoted bearing and automatically move out of engagement with the sash-frame when the latter and the slide bar reach a certain point in their ascending or descending movements.

5. The combination with a channeled slide-bar and a sash-frame pivotally mounted on said slide-bar, of a latch pivotally mounted in the channeled slide-bar and adapted to engage and lock the sash thereto, and means, substantially as described, for causing the pivoted latch to swing and automatically move out of engagement with the sash-frame when the latter and the channeled slide-bar reach a certain point in their ascending or descending movements.

6. The combination with a slide-bar and a sash-frame pivotally mounted on the slide-bar, of a latch pivoted to the slide-bar and having a locking-head and an arm or projection, a spring acting on the latch to press the locking-head out of engagement with the sash-frame, and a window frame acting on the arm or projection of the latch to hold the locking-head in engagement with the sash and provided with a socket into which the arm or projection of the latch springs when the sash-frame and the slide-bar reach a certain point in their ascending or descending movements.

7. The combination with a channeled slide-bar and a sash-frame pivotally mounted on the slide-bar, of a latch pivotally mounted on the channeled slide-bar and having a locking-head and a beveled arm or projection, a spring acting on the latch to press the locking-head thereof out of engagement with the sash-frame and a window-frame having a socket into which the beveled arm or projection of the latch springs when the said arm or projection registers with said socket.

8. The combination with a channeled slide-bar, a sash-frame pivotally mounted on said slide-bar, and a window-frame, of anti-rattling friction springs, each composed of a flattened metallic plate having reversely curved portions at its extremities, one curved portion being adjustably secured to the channeled slide-bar and the other curved portion constituting a runner or shoe which bears directly against the surface of the jamb of the window-frame.

9. The combination with a channeled slide-bar, a sash-frame pivotally mounted on the slide-bar, and a window-frame, of anti-rattling friction springs, each composed of a flattened metallic plate having reversely curved portions at its ends, one of which portions bears directly against the jamb of the window-frame and the other against the surface of the slide-bar, and an adjustable nut and bolt engaged with the said spring in juxtaposition to the curved portion which bears against the slide-bar for the purpose of adjusting or varying the tension of the spring.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

PHILIP S. RIDDELLE.

Witnesses:
ALBERT H. NORRIS,
O. T. THOMPSON.