July 13, 1926. 1,592,515

J. F. BREWE

ANTIFRICTION WINDOW SASH SUPPORT

Filed July 18, 1925

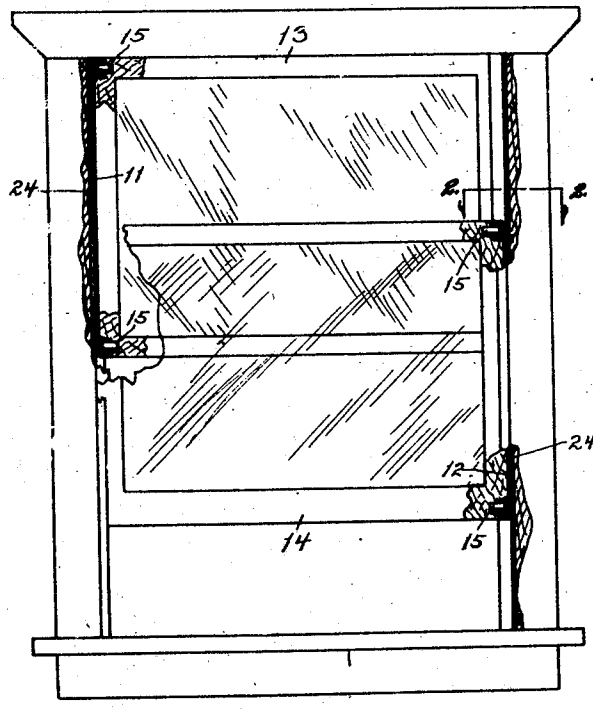


Fig. 1

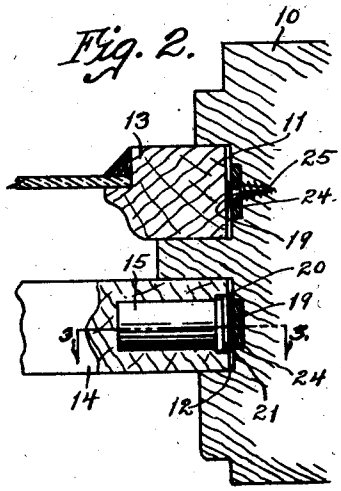


Fig. 2.

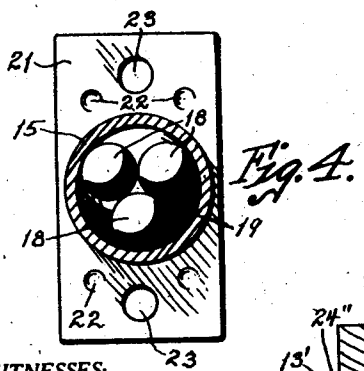


Fig. 4.

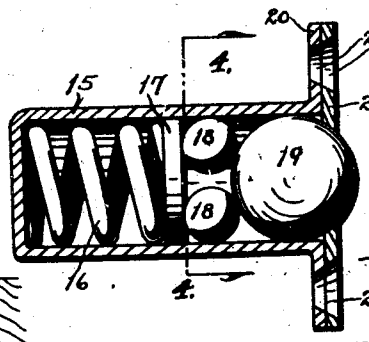


Fig. 3.

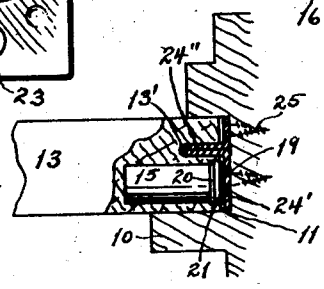


Fig. 5.

WITNESSES:

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UNITED STATES PATENT OFFICE.

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ANTIFRICTION WINDOW-SASH SUPPORT.

Application filed July 18, 1925. Serial No. 44,551.

The object of this invention is to provide an improved anti-friction means carried by a sliding window sash, or the like, and engaging the window frame, whereby easy sliding movement is secured, the sash is automatically held in any position in which it may be placed manually, and rattling of the sash in the frame is prevented.

A further object of this invention is to provide a cushioned anti-friction device, such as a bearing ball, carried by a sliding window sash and adapted for rolling engagement with the frame.

A further object of this invention is to combine with the anti-friction supporting device a means for excluding the weather from entering between the sash and its frame.

A further object of this invention is to provide a device of the class described which is economical and efficient.

With these and other objects in view, my invention consists in the construction, arrangement and combination of elements hereinafter set forth, pointed out in the claims and illustrated by the accompanying drawing, in which—

Figure 1 is a face view showing a window frame containing two sliding sash equipped with my improved devices.

Figure 2 is an enlarged horizontal section on the line 2—2 of Figure 1.

Figure 3 is a longitudinal section of the anti-friction devices detached, on the line 3—3 of Figure 2, and

Figure 4 is a cross-section on the line 4—4 of Figure 3.

Figure 5 is a detail section of a modified form, showing how the wear strip for the anti-friction devices may also embody the characteristics of a weather-strip to exclude the weather from entering between the sash and its frame.

In the construction of the devices as shown the numeral 10 designates generally a window frame, which may be formed in the usual manner with two parallel grooves 11, 12 at each side, in which sash 13, 14 are mounted for vertical sliding movement. It has been customary to provide counterbalancing means for the sash, composed generally of weights mounted for vertical movement in recesses formed in the frame, which is an expensive construction as regards time and labor involved for installation and repairs.

I have provided spring-pressed anti-friction devices carried by the sash and having rolling engagement with the grooves of the frame whereby the sash is positioned automatically and held against rattling by reason of the spring pressure. Four of the anti-friction assemblies preferably are provided, two on each side of the sash as indicated in Figure 1. Each of these devices comprises a tubular housing 15 closed at its inner end and containing a stout helical spring 16 bearing at one end against the closed end of the housing and at the other end against a disk 17 loosely mounted therein. Against the outer face of the disk 17 is placed a series of bearing balls 18, in this instance three in number, which in turn engage a relatively large bearing ball 19, of substantially the same diameter as the housing.

The outer end of the housing 15 may be formed with a peripheral attaching flange 20, and this end of the housing is closed by a plate 21 preferably of the same dimensions as the flange 20 and adapted to be attached thereto as by welding at the spots 22 (Fig. 4). The large ball 19 normally projects somewhat from the housing 15, and the closing plate 21 is formed with a central aperture, of less diameter than said ball, through which a portion of the ball projects for rolling contact with a member.

Each housing 15 is mounted in a cylindrical bore formed in a suitable location in the sash and opening to the outer margin thereof, and is held in place by means of screws or the like extended through holes 23 formed in the closing plate 21 and attaching flange 20, which plate and flange preferably are countersunk in the surface of the sash rail, which permits the projecting portion of the bearing ball 19 to project a suitable distance beyond such surface.

The sash so equipped is mounted for sliding movement in the grooves of the window frame, the balls 19 being pressed inwardly somewhat by contact with the bottoms of the grooves, whereby the springs 16 are placed under tension. Preferably a wear strip such as 24, of brass or other suitable material, is placed at the bottom of each groove to receive the actual contact of the rolling balls 19, and held in place as by screws 25.

When sliding movement is imparted to

the sash the balls 19 roll freely on the wear strips 24 and on the balls 18, which it touches at three points only, so that friction is reduced to a minimum. The tension of the springs 16 is sufficient that it exerts pressure on the balls 19, through the disks 17 and balls 18, that said balls 19 are pressed firmly against the bottoms of the grooves (or the wear plates therein) and the sash is thereby held in any position in which it may be placed manually. This also tends to hold the sash firmly in place against rattling in its frame. By this means the use of window weights or other stop means is eliminated, and the other advantages named are also secured at small cost, as the devices are inexpensive and are easily installed in the sash; likewise there is little likelihood of their getting out of order.

In Figure 5 I have shown a construction in which the wear strip 24′ has also the function of a weather strip to exclude the elements from entering between the sash and frame. The strip 24′ is formed with a flange 24″ extending at right angles to its body and entering a groove 13′ formed vertically in the adjacent face of the sash, which slidably engages the same. The anti-friction devices are located at one side of the flange 24″.

I do not wish to be understood as limiting myself to the precise construction, as various modifications, within the scope of the claims, may be employed without departing from my invention. For instance the cushioning means behind the anti-friction devices, and also the inner arrangement of bearing balls, may be of different form, as also the construction of the housing. I also call attention to the fact that the device may be used in connection with other movable members aside from window sash, as for instance a friction latch for a swinging door.

I claim as my invention—

1. A device of the character described, comprising a cylindrical housing closed at its rear end, a coil spring mounted in the closed end of said housing, a flat disk engaging said spring, a series of bearing balls engaging said disk tangentially, and a relatively large bearing ball of substantially the same diameter as said housing engaging the series of balls, together with a substantially plane closing plate for said housing having a hole through which a portion of the large bearing ball projects for rolling contact with a stationary device.

2. The combination with a fixed and a movable member of a cylindrical housing carried by said movable member, a wear plate carried by said fixed member, a cushioning spring in said housing, a series of bearing balls backed by said spring, a single relatively large bearing ball of substantially the diameter of the housing mounted therein and engaging the series of balls, a closure for the housing formed with an aperture through which a portion of the large ball projects for rolling contact with said wear plate, said plate having a plane smooth surface with which said large ball contacts, said spring being placed under tension by engagement of said ball with said plate whereby the movable member tends to remain in any position in which it is placed.

3. The combination with a window frame and a sash slidable therein, said frame being formed with a groove to receive said sash, of a wear plate formed with a plane face and with a right-angled flange at one side of said plane face extending into a groove in said sash, a housing countersunk in said sash, a coil spring in said housing, a series of bearing balls backed by said spring, a relatively large bearing ball engaging the series of balls, and a closing plate for said housing substantially parallel with the plane face of said wear plate and formed with a small opening through which a portion of the large ball projects for rolling contact with the plane face of said wear plate at one side of said flange.

Signed at Chicago, in the county of Cook and State of Illinois, this 26th day of June, 1925.

JOHN F. BREWE.