

April 15, 1930.

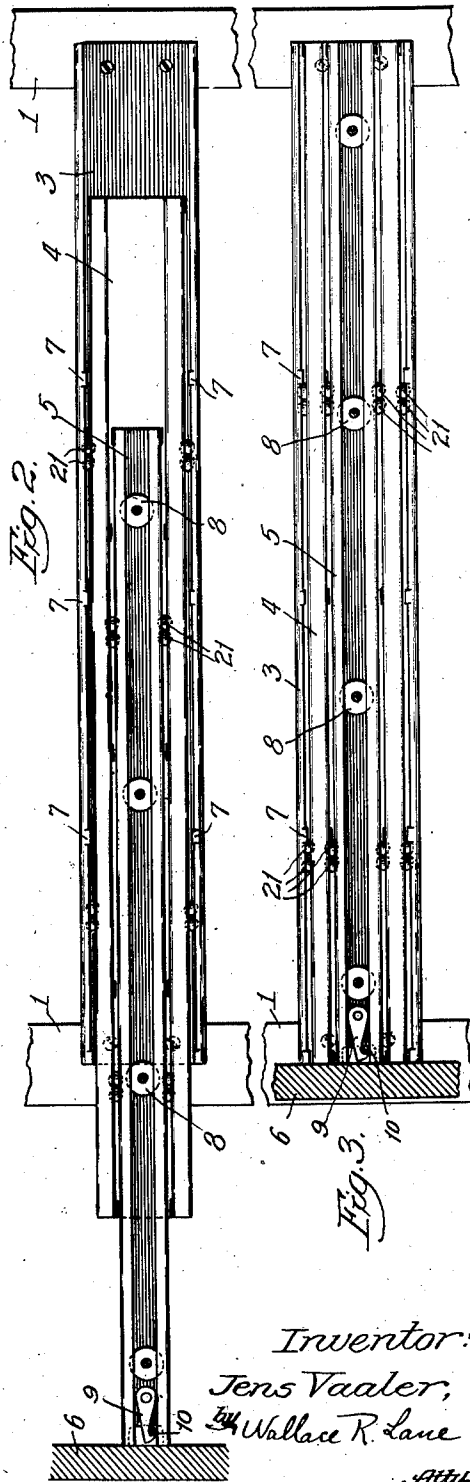
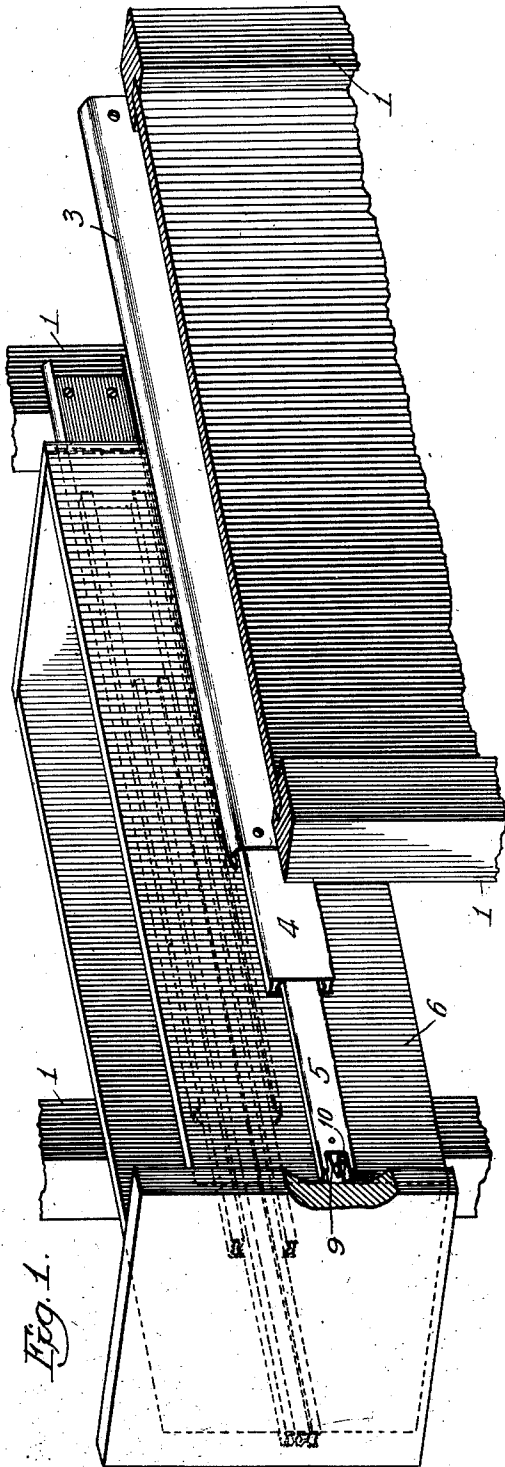
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1,754,448

DRAWER SLIDE

Filed Feb. 26, 1926

3 Sheets-Sheet 1



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April 15, 1930.

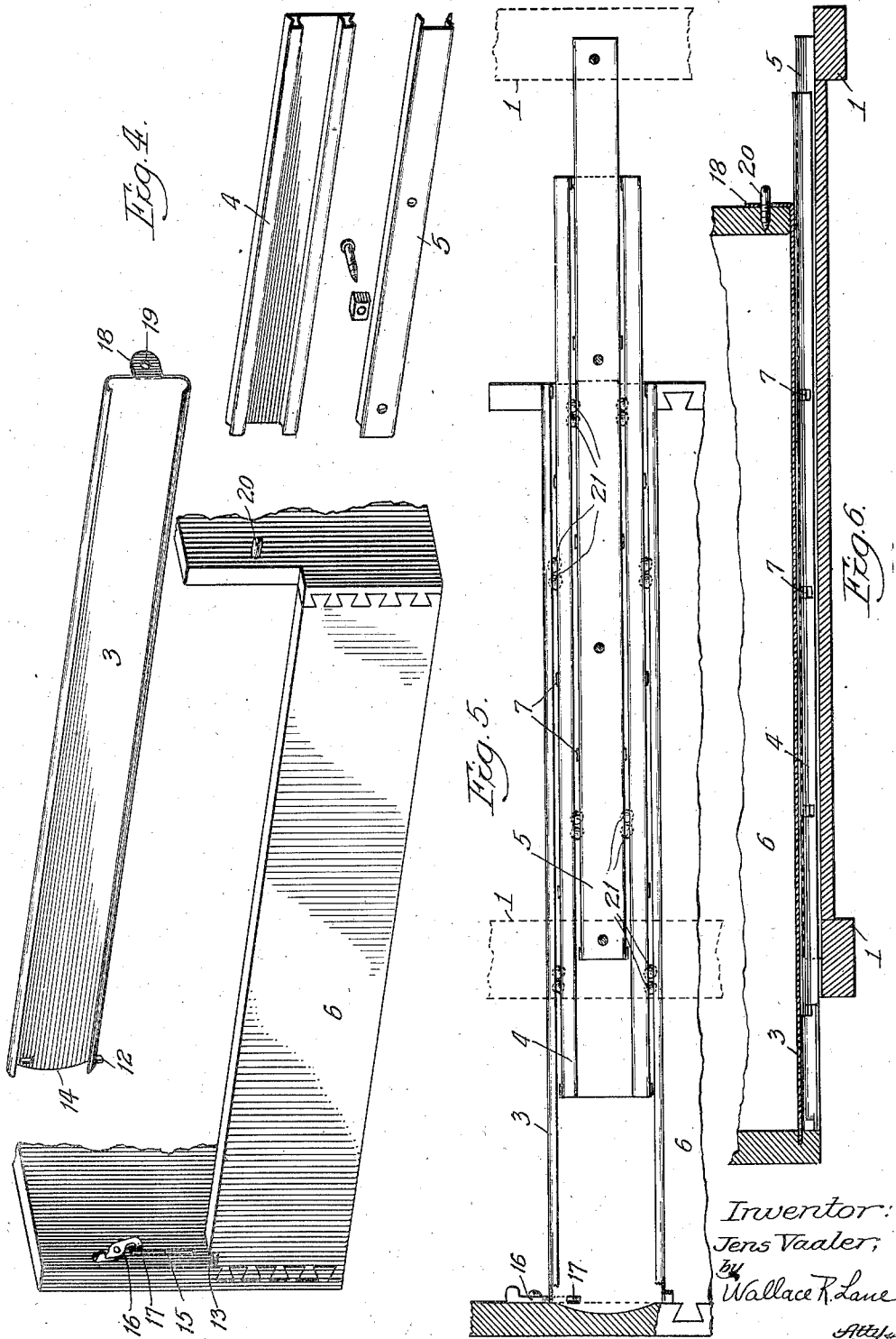
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

Fig. 8.

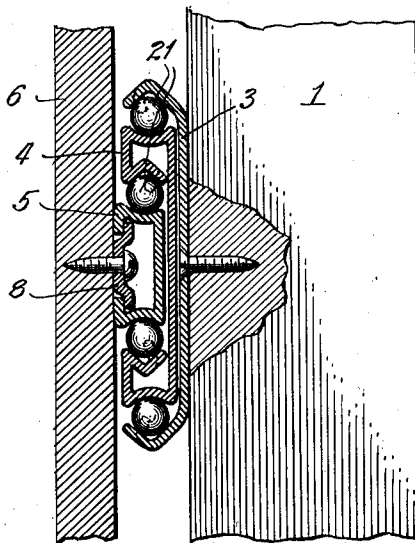


Fig. 7.

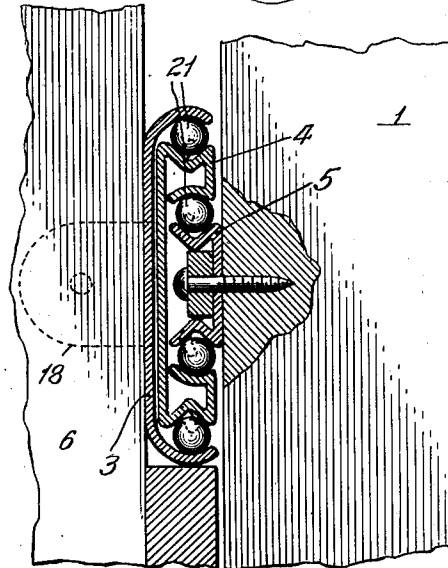


Fig. 9.

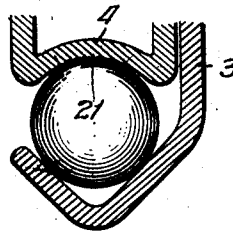


Fig. 10.

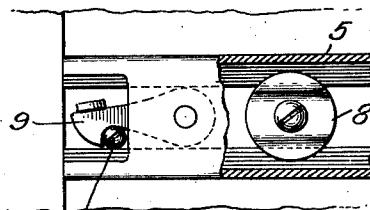
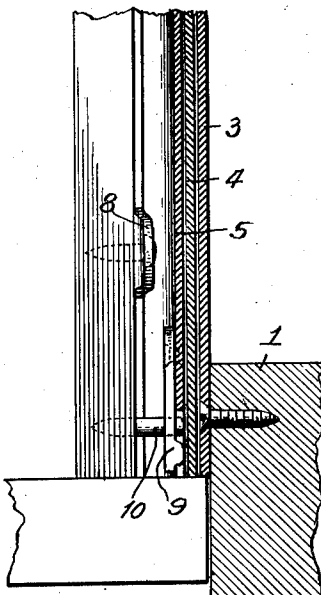


Fig. 11.

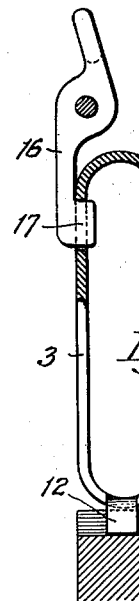


Fig. 12.

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UNITED STATES PATENT OFFICE

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DRAWER SLIDE

Application filed February 26, 1926. Serial No. 90,756.

My invention relates particularly to drawer slides of the type which employ anti-friction means for aiding in the free longitudinal movement of the drawer.

One of the objects of this invention is to produce an extensible drawer support of a construction that is practically free from friction.

Another object of this invention is to produce a drawer slide having anti-friction means and which is adapted to prevent lateral motion of the drawer.

Another object of this invention is to produce a drawer slide having several longitudinally movable members adapted to reciprocate at different relative speeds.

Further objects, advantages and capabilities will later become more readily apparent.

My invention further resides in the combination, construction and arrangement of parts illustrated in the accompanying drawings, and, while I have shown therein a preferred embodiment, I wish it understood that the same is susceptible of modification and change without departing from the spirit of my invention.

In the accompanying drawings,

Fig. 1 is a perspective view with portions broken away to indicate the mounting of the drawer slide in connection with a stationary support and a movable drawer.

Fig. 2 is a side elevation of the drawer slide shown in Fig. 1, showing the slide extended approximately the same as in Fig. 1.

Fig. 3 is a side elevation of the same drawer slide telescoped into a closed position.

Fig. 4 is a disassembled view of a modification of the invention somewhat different from that shown in Fig. 2, and illustrating the manner in which it is secured to a drawer.

Fig. 5 is a side elevation of the drawer slide illustrated in Fig. 4 showing it partially extended.

Fig. 6 is a horizontal cross-sectional view taken on a line to the center of Fig. 5 and showing the same drawer slide extended to a somewhat less degree.

Fig. 7 is a vertical cross-sectional view of the drawer slide shown in Figs. 4, 5, and 6.

Fig. 8 is a vertical cross-sectional view of

the drawer slide illustrated in Figs. 1, 2, and 3.

Fig. 9 is an enlarged view indicating the points of contact between the anti-friction ball and the grooves of the slides.

Fig. 10 is a horizontal sectional view of the drawer slide shown in Fig. 3.

Fig. 11 is a detail showing the washer and pawl by which the inner groove member is secured to the drawer.

Fig. 12 is a vertical sectional view of the front end of the drawer slide shown in Fig. 4 indicating how the same is secured to and locked to a drawer.

Referring in greater detail to the drawings, in the construction illustrated in Figure 1 the normally stationary member 3 is attached to supporting means, which as shown consists of front and rear supports 1. Slidable within the member 3 is an intermediate or floating member 4, and positioned within the last mentioned member is a third or drawer engaging member 5, which as shown in Figure 1, is detachably secured to a drawer 6. The cross-sectional view in Fig. 8 illustrates entirely the relative position of these various slide members.

A plurality of balls are disposed in the grooves between the several members and are free to roll in those grooves between the ball stops 7. Other means may, however, be employed for ball stops to limit the longitudinal travel of these balls. Washers 8 are provided to have sliding engagement with the channel member 5, and are adapted to permit that member to be readily removed from the drawer by sliding the drawer out after the pawl 9 has been disengaged from the pin 10. As illustrated in Figs. 2, 10 and 11, the pin 10 is mounted in the side of the drawer and the pawl 9 is mounted pivotally on the channelled member 5. The side of the drawer is provided with washers 8 and when these washers are slid into locking engagement with the member 5 the pawl 9 may finally be drawn into tight locking engagement with the pin 10 thereby fixing the member 5 to the side of the drawer. A cut-out portion in the outer end of the member 5 enables one to reach and operate this pawl manually in order that the drawer may be readily removed

from the slide and taken out of the cabinet.

When the modification of the slide illustrated in Figs. 4, 5, and 6 is used the outer end of the largest slide member is provided with means for locking that member to the drawer. It will be noted that the side of the drawer is cut out to receive the drawer slide. This feature enables the inventor to mount a drawer of maximum capacity between the supports which are of a given distance apart. No space is required between the outside edge of the drawer and the adjacent surface of the support. The front end of the slide member in this modification is provided with a projection 12 which is adapted to seat within a recess 13 in the front end of the drawer. A curved extension 14 is provided on the outer end of the member and is adapted to fit into a recess 15 in the drawer. The pawl 16 may then be rotated to locking engagement with a recess 17 in the member. The rear end of this same member is provided with an ear 18 having a hole 19 adapted to fit over a pin 20 on which the rear end of the drawer is then supported.

Referring now to Figs. 7, 8, and 9 it will be noted that the opposing grooves of the several members are unlike, one being curved to provide one point of contact with the ball 21 and the opposite surface being adapted to provide two points of contact with the ball. In this manner the ball is adapted to rotate entirely without friction between the two grooves and with its axis of rotation parallel to a line through the two points of contact in one groove and nearer to it than it is to the single point of contact in the opposite groove. It will be seen that as the ball rolls between the grooves in one revolution it will contact with a greater line of contact of one of the grooves than with the other. The circle of contact of the ball with the V-shaped groove is considerably smaller than the circle of contact with the circular groove. The contact of the ball with the circular groove is along the great circle of the ball whereas either of the circles of contact with the V-shaped groove is approximately as illustrated in the drawing about two thirds of the great circle. The result obtained by this feature of construction is that while the drawer 6 in Fig. 8, for illustration, is being extended the slide member 5 will move a greater distance during a single revolution of the ball than will the slide member 4. In other words, the relative speed of travel of the two members will be dependent upon the relative sizes of their circles of contact with the ball 21. This design also effects a positive movement of the ball every time the drawer is reciprocated and prevents the ball from locating in one spot in the groove and forming depressions therein. The same advantages in the sliding means are obtainable in the modification illustrated in Fig. 7.

It will also be noted that this type of an extensible support not only provides a frictionless sliding means but also by reason of the shape of the grooves and the balls it prevents lateral movement of the drawer between its supports, without introducing any friction to prevent such lateral motion.

While I prefer channel members of the construction illustrated I do not wish to limit myself to the number of members shown here nor to a construction which employs the same number of grooves on each element. Nor do I wish to limit myself to the employment of balls for an anti-friction element, as other anti-friction elements may be used to produce the different relative speeds of travel of the several slide members in this extensible drawer support.

Having shown and described my invention, I claim:

1. An extensible drawer construction comprising relatively movable members slightly spaced apart, an inner guide carried by one of said members and having opposed guide faces, an intermediate member having portions overlying both faces of the inner guide, said overlying portions each having opposed guide faces one of which is in opposition to the adjacent face of the inner guide, and a third guide having portions overlying both portions of the second member each portion forming an opposed guide face adjacent to the other guide face of the intermediate member and rotatable members interposed between all of said guide faces, said opposed guide faces being proportioned to provide different contacting surface areas for the rotatable members.
2. A ball race for relatively movable members of an extensible drawer construction or the like comprising two sheet-metal members having portions lying in spaced apart juxtaposition and forming opposed faces of a ball race, a ball therebetween, one of said portions having a relatively broad supporting face of substantially the curvature of the interposed ball and the other having integral angularly disposed flanges disposed at an angle so as to contact the ball at portions less than the great circle of the ball.
3. A ball race for relatively movable members of an extensible drawer construction or the like comprising two sheet-metal members having integral portions lying slightly spaced apart and forming opposed faces of a ball race, a ball between said faces, one of said portions having its face bent to roll on the great circle of the ball and the portion of the other sheet-metal member having its face bent to roll on a lesser circle of the ball.
4. A ball race for relatively movable members on an extensible drawer construction or the like comprising two sheet metal members each having integral portions lying slightly spaced apart from the other and forming op-

posed faces of a ball race, a ball between said faces, one of said portions having its face formed to contact at only one portion of the ball and the other member having its portion bent at an angle to provide two faces simultaneously contacting the ball.

5 5. An extensible drawer construction comprising a drawer and a slide adapted to be detachably connected thereto, the front of the drawer having a slot or groove therein and provided with an adjacently disposed latch, the front of the slide having its edge convexedly curved and slotted at a portion spaced rearwardly from the front edge thereby permitting the curved edge of the slide to be inserted in the slot of the drawer front and the latch to enter the slot of the slide whereby detachably and securely to fasten said drawer and slide together.

10 6. An extensible drawer construction comprising a drawer and a slide adapted to be detachably connected thereto, the front of the drawer having a slot or groove therein and the front of the slide having its edge convexedly curved to permit the slide to enter the groove of the drawer front and means for detachably holding said drawer and slide in assembled relation.

15 7. An extensible drawer construction having two extensible members and a stationary member, one of said extensible members being movably supported by rotatable elements on the other extensible member, and the last mentioned member being movably supported by rotatable elements on the stationary member, each extensible member having portions engaging said rotatable elements at a greater distance from the axes of rotation of said rotatable elements than the distance from said axes to the supporting surfaces engaged by said rotatable elements.

20 8. An extensible drawer construction comprising a normally stationary member, an intermediate member, rotatable elements interposed between said members so that the intermediate member is movably mounted thereon, a drawer engaging member, additional rotatable elements interposed between said intermediate member and said drawer engaging member so that the last mentioned member is movably supported thereby, said intermediate member and said drawer engaging member having portions engaging said rotatable members at a greater distance from the axes of rotation of said rotatable members than the distance from said axes to the surfaces of said stationary member engaged by said rotatable elements.

25 9. An extensible construction for drawers or the like comprising a series of relatively extensible members each being supported by balls from the next succeeding member of the series, each supported member having portions engaging said balls at a greater distance from the axes of rotation thereof than the

distance from said axes to the supporting surfaces engaged by said balls.

30 10. An extensible construction for drawers or the like comprising a series of members, rotatable means for successively supporting each member from its succeeding members of a series, so as to permit the respective successive members to move relatively, the rolling means engaging surfaces of said members and said rotatable means being so relatively proportioned that said surfaces of the supported members are provided with greater contact surface area for the rotatable means than is provided by the contacting surfaces of the supporting member, so that each supported member will travel farther than its supporting member during each rotation of said rotatable supporting means.

35 11. An extensible drawer construction comprising a stationary support, a drawer guide provided with ball engaging portions, a main guide member carried by said support and provided with spaced apart ball engaging surfaces, an intermediate guide member having oppositely disposed sets of ball engaging faces, one set being located opposite the drawer guide and the other set being located opposite the ball engaging faces of the main guide member, and balls disposed between the respective guides, said guides being so relatively proportioned that the ball engaging portions of the drawer guide have rolling contact along a greater circle of the interposed balls than have the ball engaging portions of the set of adjacent opposed faces of the intermediate guide, and the ball engaging surfaces of the other set of the intermediate guide having a rolling contact along a greater circle of its interposed balls than do the adjacent ball engaging surfaces of the main guide member.

In witness whereof, I hereunto subscribe my name to this specification.

JENS VAALER.