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C. V. MAYER

1,776,163

DOOR MOUNTING FOR SLIDABLE DOORS

Filed April 11, 1929

3 Sheets-Sheet 1

Fig. 1.

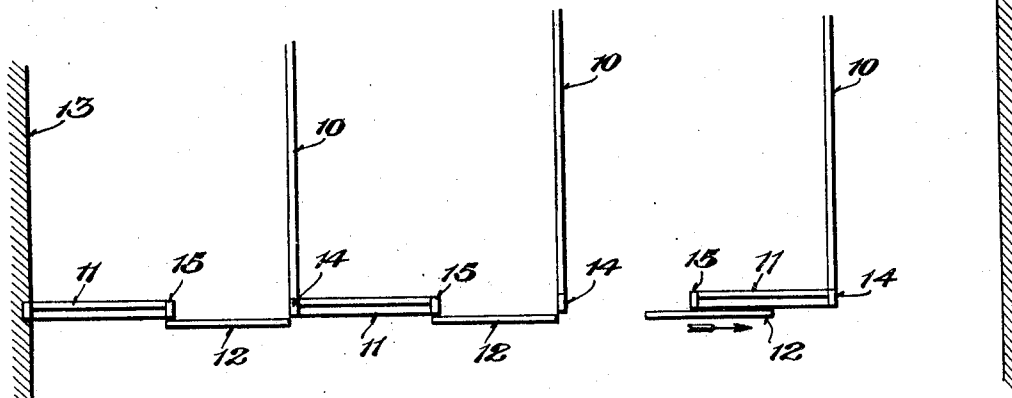


Fig. 2.

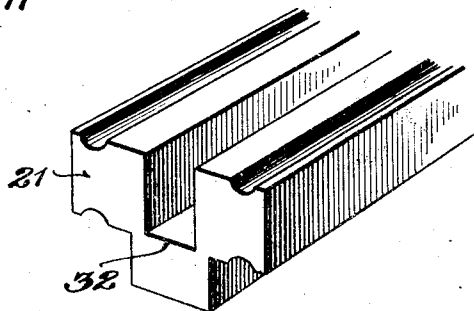
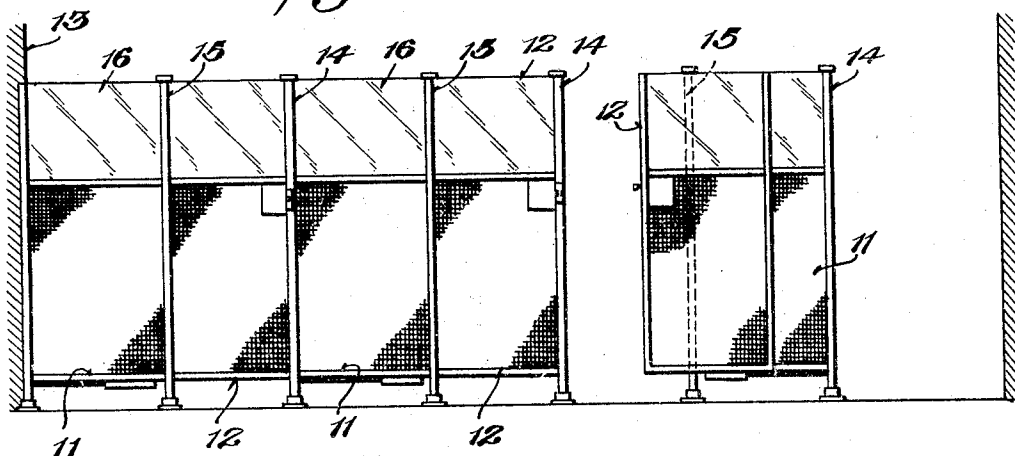


Fig. 9.

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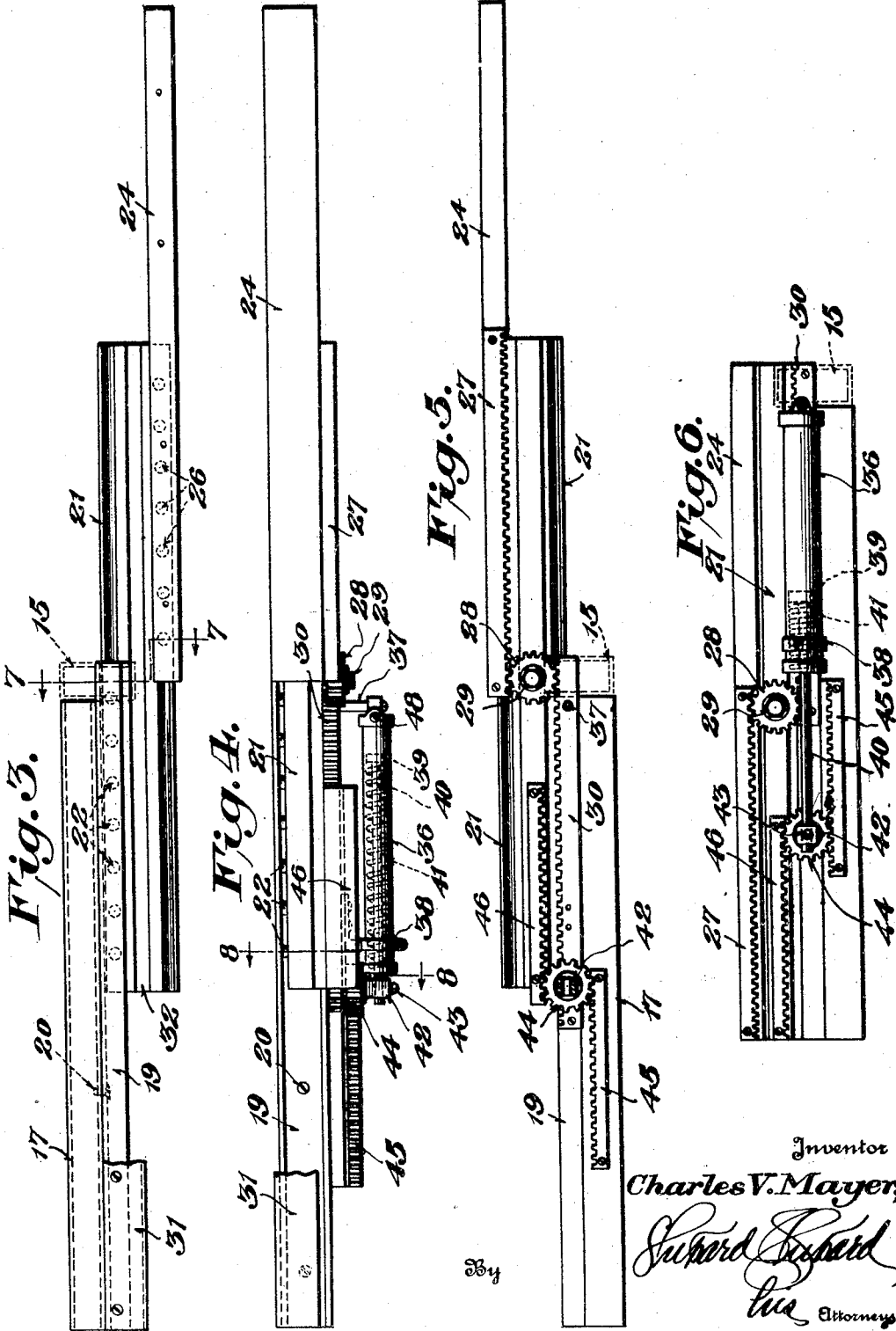
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Fig. 7.

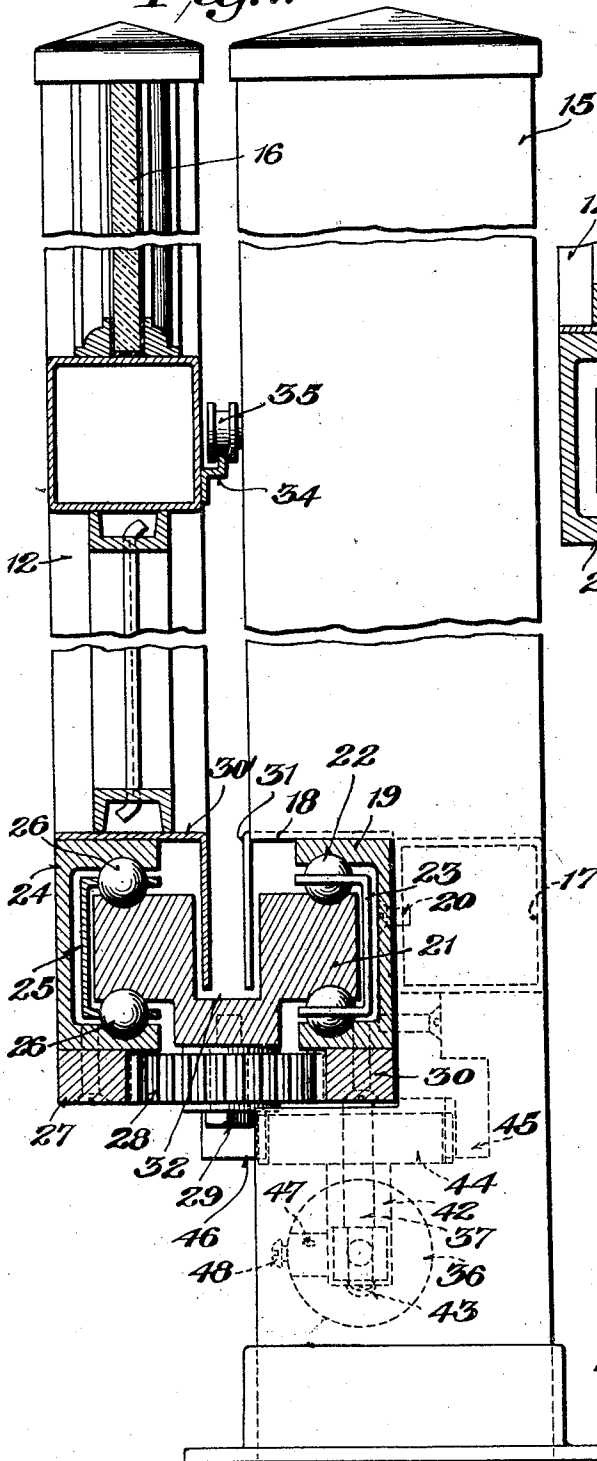
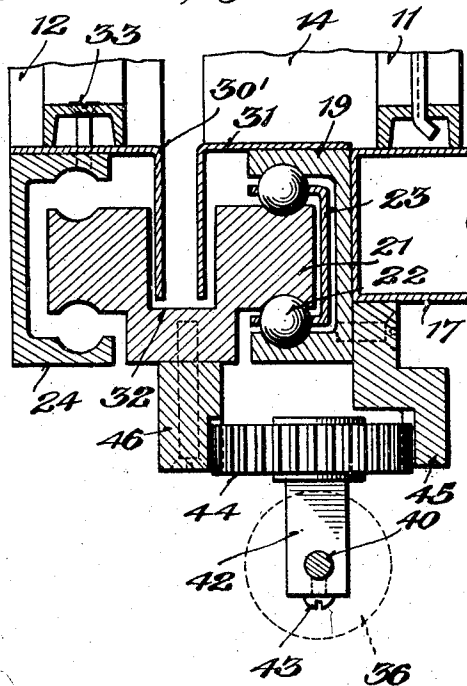


Fig. 8.



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UNITED STATES PATENT OFFICE

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DOOR MOUNTING FOR SLIDABLE DOORS

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This invention relates to sliding doors, and has for its prime object to provide a new and improved door mounting capable of general application, but specifically designed for use in connection with sliding doors for bank tellers' cages.

According to the most modern practice, the walls, partitions and doors of bank tellers' cages are made up of lower panels of wood or metal and upper glass plates without the use of any top horizontal frame bars, consequently the use of a top-hung slidable door is impossible. Moreover, the height of a cage is about five feet, six or nine inches, so that a door supporting track at the top of the cage would be very unsightly if elevated to the necessary height, and if located at the top of the cage, would be in the path of persons passing into and out of the cage. For these reasons, I have provided a bottom support for such doors, and have arranged the support so that it may be conveniently and effectively mounted on the posts of a cage, at a slight elevation above the floor to permit cleaning of the floor beneath the door, and entirely out of the way of persons passing into and out of the cage. Moreover, the door mounting lies entirely within the width of the cage, and enables the use of the invention where the door is adjacent a wall or a passageway, and avoids the projection of any portion of the mounting into a passageway or the formation of an opening or recess in a wall to accommodate the mounting. The mounting is entirely beneath the bottom of the door and does not encroach in any manner on the space within the cage.

With these and other objects in view, the present invention consists in the combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings and particularly pointed out in the appended claims, it of course being understood that changes in the form, proportion, size and minor details may be made, within the scope of the claims, without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings—

Figure 1 is a diagrammatic plan view illustrating the use of the present invention in connection with a succession of bank tellers' cages.

Figure 2 is a rear elevation of Figure 1. 55

Figure 3 is a plan view of the door mounting of the present invention in the normal closed position of a slidable door.

Figure 4 is a side elevation of Figure 3.

Figure 5 is a bottom plan view of Figures 3 and 4, the door closing and check device being omitted. 60

Figure 6 is a bottom plan view showing the condition of the mounting in the open position of the door with the closing and checking device in place. 65

Figure 7 is an enlarged cross-sectional view taken on the line 7—7 of Figure 3 and showing the device mounted on a post and supporting a door. 70

Figure 8 is a detailed cross-sectional view taken through the mounting on the line 8—8 of Figure 4.

Figure 9 is a fragmentary perspective view of one end portion of the traveling track bar. 75

Before describing the specific construction of the present door mounting, reference will be made to Figures 1 and 2 of the drawings wherein three successive tellers' cages have been shown diagrammatically, and wherein 80 10 indicates upright partitions separating cages, and 11 indicates the back walls of the cages, while 12 indicates the slidable doors. The reference character 13 indicates a wall of the building which also constitutes the side wall of one of the cages. There is of course a passageway at the rear of the cages, and the doors 12 control the door openings between the passageway and the interior of the cages. The back walls of the cages include posts or uprights 14, it being a common practice to have a post or upright at each corner of the cage and to which the partitions 10 are secured. In addition to the corner posts 14, it is the common practice to provide an intermediate post 15, to define with one of the corner posts a doorway and to cooperate with the other corner post for the support of the back wall or panel 11. The most modern form of wall and door has been shown in 100

Figure 2, wherein it will be seen that the lower portion of the door and of the back wall is of wood or metal, and the upper portion is a glass plate 16 to give visibility across the wooden or metal portion. There are no frame bars extending along the top edges of the glass plates, and therefore, in modern practice, the cage structure does not afford any chance for an overhead support for a sliding door, and it is to meet this condition that I have invented the present door mounting, which mounting lies below the bottom of the door and the back partition of the cage, entirely out of the way and at a suitable elevation to permit convenient cleaning of the floor beneath the door and the back wall of the cage.

For an understanding of the specific construction of the present mounting, reference is now made more particularly to Figure 7 of the drawings, wherein 15 designates one of the cage posts or uprights, to which is secured in any suitable manner the bottom frame 17 of the back wall of the cage. This frame bar has been shown as a metal tube, in Figures 7 and 8, rectangular in cross-section. It will be noted that the bottom frame bar 17 of the back wall is about half as wide as the post 15, which is a conventional construction. In line with the bottom frame bar 17, a notch or opening 18 is provided in the back wall and opposite sides of the post so as to receive the fixed track member 19 of the present invention. It will of course be understood that each end of the stationary track member 19 is seated in a notch in one of the posts, and the length of the bar is such that it extends from one post to the other but does not project beyond either post. This track member is in the form of a channel with its back in an upright position and secured to the frame bar 17 by suitable fastenings, one of which has been indicated at 20 in Figure 7 of the drawings. The channel opens rearwardly and receives one edge portion of a traveling track bar 21, which is about the same length as that of the stationary track bar 19, and is of a width to project a suitable distance beyond the open side of the stationary channel 19. Anti-friction bearings are provided between the top and bottom of the traveling track member 21 and the top and bottom walls of the stationary track member 19 and include ball bearings 22 mounted in the top and bottom walls of a channel-shaped cage 23 lying in the channel 19 and embracing the movable track 21. The overlapping parts of the members 19 and 21 are of course provided with grooves to accommodate the anti-friction bearings and provide races therefor in any preferred or well-known manner. Mounted to slide endwise upon the other projecting portion of the slidable track member 21 is a channel 24 constituting a slidable shoe

and on which is supported the door 12 which may be of any suitable construction. This channel 24 faces inwardly and slidably embraces the outer edge portion of the traveling track member 21. A cage 25 and anti-friction ball bearings 26 are provided between the shoe 24 and the traveling track member 21. As thus far described, it will be understood that the shoe 24, the traveling track member 21 and the fixed or stationary track member 19 are telescopically assembled and may be moved endwise so as to extend the support and hold the door in its closed position, and then may be moved in a reverse direction so as to telescope or close the parts upon themselves and bring the door in an open position.

To provide for the necessary endwise movements of the traveling track member 21 and the shoe 24 when the door is slidably moved from one position to another, the shoe is provided on its lower side with a rack 27 having its teeth facing inwardly and in mesh with a pinion 28 mounted on a stud or post 29 projecting downwardly from the bottom of the traveling track member 21. The pinion 28 is in mesh with another rack 30 provided on the bottom of the fixed track member 19, so that when the door and its bottom shoe 24 are moved endwise, the rack 27 rotates the pinion 28, carried by the traveling track section 21, which will result in the travel of the pinion 28 along the rack 30, which will of course further result in the endwise movement of the traveling track member 21 in the same direction with the shoe 24. The traveling track section 21 will of course travel simultaneously with the travel of the pinion 28 on the rack 30, but the shoe 24 will travel about twice as fast as the traveling track member 21, for the reason that it will travel with the bodily movement of the pinion, and will also have an additional movement imparted thereto by reason of the rotation of the pinion on its support or bearing while it is traveling along the fixed rack on the fixed track section. By this combination and arrangement of parts, the traveling track section 21 will telescope upon the fixed track section 19 through a comparatively short path, while the door shoe 24 will telescope through a much longer path and eventually come into registration with the other parts of the mounting entirely at one side of the door opening.

To protect the ball bearings against dust, there are provided the two dust guards 30' and 31, which are secured to the tops of the parts 24 and 19 respectively and have depending flanges which extend down into a groove or channel 32 provided in the top of the traveling track 21, whereby to effectually exclude dust or dirt from the anti-friction bearings.

The door may be secured to the shoe 24 in

any suitable manner, as by fastenings extending through the bottom rail of the door and into the shoe 24, one such fastening being shown at 33 in Figure 8 of the drawings.

While lateral displacement of the shoe 24 from the traveling track member 21 is prevented by the anti-friction bearings 26, it is desirable to prevent the door from tilting outwardly, and this is accomplished by the provision of a guide bar 34 provided upon the inner side of the door and offset therefrom and traveling in a guide 35 provided upon the post 15. This guide may be in the form of a grooved roller as well shown in Figure 7 of the drawings.

To maintain the door under tension in its closed position and to automatically return the door from its open position to its closed position, there is provided a spring device consisting of a stationary chamber or casing 36 hung from the bottom of the stationary track member 19 by suitable brackets 37 and 38. Within the casing there is a plunger 39 having a stem 40 working through one end of the casing, and a spring 41 within the casing and interposed between the plunger 39 and the end of the casing through which the plunger rod 41 extends.

The outer free end of the plunger rod carries an upstanding bracket 42, which is held thereto by a set screw 43 to permit adjustment of the bracket longitudinally of the plunger rod. A pinion 44 is mounted upon a post rising from the bracket 42, and this pinion is in mesh with a fixed horizontal rack 45 depending from the fixed or stationary track member 19. The opposite side of the pinion 44 is in mesh with a rack depending from the bottom of the traveling track member 21. When the door is moved from its closed position, as in Figure 5, to its open position, as in Figure 6, the traveling rack 46 will rotate the pinion 44 on its bracket 42, which will cause the pinion to travel along the fixed rack 45, whereby the plunger 40 will be drawn out of the casing 36 and the spring will be compressed, thus putting the mounting and the door under spring tension in its open position such that when the door is released it will be automatically moved back into its closed position. The plunger 39, in traveling thru the casing 36 back to its original position of course compresses the air in the casing which operates to check the movement of the door and prevent slamming thereof. The end of the cylinder is of course provided with a suitable vent opening 47 controlled by a screw 48 so as to adjust the check and accommodate it to any specific condition.

From the foregoing description, it will be understood that the door mounting of the present invention is entirely complete in itself and may be conveniently mounted upon the posts or uprights of tellers' cages or the

like, in a position underlying the bottom of the door so as to support the door at its bottom and to be disposed entirely out of the way and without occupying any desirable space within or at the exterior of the cage. The parts are so proportioned and related that there are no parts projecting into and obstructing the doorway when the door is open, and there are no parts projecting beyond the limit of the opening movement of the door.

In order to provide for the opening and closing of the door from a remote point, as by means of an electric switch, I contemplate the use of an electric motor operatively connected with either of the pinions for rotating the same so as to open and close the door by the movements of the various parts as hereinbefore described.

The fixed track member, the travelling track member and the door shoe are of equal lengths. The travelling track member projects for half of its length beyond the fixed track member, while the door shoe projects for half its length beyond the travelling track member in the closed position of the door. The travelling track member therefore travels a distance equal to one half of its length in telescoping upon the fixed track member by the opening of the door, and consequently the pinion 28 is mounted upon the travelling track member midway between its ends, so that when the pinion has travelled along one half of the length of the fixed track member, the travelling track member will be in complete registration with the fixed track member.

The casing of the spring actuated door closing means is hung from the fixed track member and extends rearwardly from the outer or forward end thereof so as not to project into the doorway when the door is open and also to be out of the way and substantially hidden beneath the door mounting. The length of the casing is slightly less than one-half of the length of the fixed track member, and its rear end is located about midway of the length of the fixed track member, so that the pinion 44 is located at about the middle of the fixed track member and at the rear end of the travelling track member in the closed position of the door. Now when the pinion is rotated by the opening movement of the travelling track member, said pinion travels along the fixed track for one-half the distance of the travel of the travelling track member, or in other words about one-fourth of the length of the fixed track member, whereby the parts of the door closing means always lie between the opposite ends of the fixed track member and therefore do not project beyond the limits of the door mounting in the open position of the door.

What is claimed is:

1. A door mounting for slidable doors,

comprising a fixed channel track member, a traveling track member mounted for endwise movement in the channel and projecting laterally therefrom, a channel door shoe embracing the outer longitudinal edge portion of the traveling track member and mounted for endwise movement thereon, upper and lower anti-friction devices between the traveling track member and the top and bottom flanges of the fixed track member and the door shoe, dust guards carried by the fixed track member and the shoe and closing the open sides of the anti-friction devices, and means to move the traveling track member upon the fixed track member by the endwise movement of the door shoe on the traveling track member, said means effecting a differential movement between the traveling track member and the door shoe such that said members will be simultaneously telescoped upon the fixed track member by the movement of the shoe from its closed to its open position.

2. A door mounting for sliding doors, comprising a fixed channel track member, a traveling track member mounted for endwise movement in the channel and projecting laterally therefrom, a channel door shoe embracing the longitudinally projecting portion of the traveling track member and movable endwise thereon, antifriction devices between the flanges of the channel members and the top and bottom of the traveling track member, the top of the traveling track member having a longitudinal groove, dust guards secured to the tops of the fixed track member and the door shoe respectively and provided with depending flanges extending into the groove in the traveling track member and closing the open sides of the upper anti-friction devices, and means to move the traveling track member upon the fixed track member by the endwise movement of the door shoe on the traveling track member, said means effecting the differential movement between the traveling track member and the door shoe such that the said members will be simultaneously telescoped upon the fixed track member by the movement of the shoe from its closed to its open position.

3. A door mounting for slidable doors, comprising a fixed track member, a traveling track member mounted for endwise movement on the fixed track member, a door shoe mounted for endwise movement upon the traveling track member, means to move the traveling track member upon the fixed track member by the endwise movement of the door shoe on the traveling track member, said means effecting a differential movement between the traveling track member and the door shoe such that said members will be simultaneously telescoped upon the fixed track member by the movement of the shoe from its closed to its open position, and

spring means tending to move the door shoe into its closed position and including a spring pressed plunger rod carrying a pinion in mesh with a fixed rack and a rack carried by one of the movable members.

4. A door mounting for slidable doors, comprising a fixed track member, a traveling track member mounted for endwise movement on the fixed track member, a door shoe mounted for endwise movement upon the traveling track member, means to move the traveling track member upon the fixed track member by the endwise movement of the door shoe on the traveling track member, said means effecting a differential movement between the traveling track member and the door shoe such that said members will be simultaneously telescoped upon the fixed track member by the movement of the shoe from its closed to its open position, a casing hung from the fixed track member, a spring pressed plunger working in the casing, a plunger rod working through one end of the casing, a pinion carried by the plunger rod, a fixed rack upon which the pinion is mounted to travel and a rack carried by one of the movable members and in mesh with the pinion.

5. A door mounting for sliding doors, comprising a fixed track member, a traveling track member mounted for endwise movement upon the fixed track member, a door shoe mounted for endwise movement upon the traveling track member, a pinion carried by the traveling track member, a fixed rack on which the pinion travels, a rack upon the shoe and in mesh with the pinion to rotate the latter, a stationary casing, a spring pressed plunger in the casing, a plunger rod working through one end of the casing, a pinion mounted upon the plunger rod, a fixed rack on which the pinion travels, and a rack carried by one of the moving members and in mesh with the pinion to rotate the same.

6. The combination with a sliding door having an elevated bottom edge, of a fixed track member mounted at one side of the door below the bottom thereof, a traveling track member mounted for endwise movement upon the fixed track member, a door shoe at the bottom of the door and mounted for endwise movement upon the traveling track member, and means to move the traveling track member upon the fixed track member by the sliding movement of the door and its shoe on the traveling track member, said means effecting a differential movement between the traveling track member and the door shoe such that said members will be simultaneously telescoped upon the fixed track member by the movement of the door from its closed to its open position.

7. A door mounting for slidable doors, comprising a fixed track member, a traveling track member mounted for endwise movement

on the fixed track member, a door shoe mounted for endwise movement upon the traveling track member, means to move the traveling track member upon the fixed track member by the endwise movement of the door shoe on the traveling track member, said means effecting a differential movement between the traveling track member and the door shoe such that said members will be simultaneously telescoped upon the fixed track member by the movement of the shoe from its closed to its open position, and spring pressed door closing means underlying the fixed track member and disposed between the ends thereof in both the closed and open positions of the door, and means for tensioning the door closing means by the opening movement of the door mounting.

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