Dec. 28, 1926. 1,612,443

H. A. JOHNSON ET AL

FOLDING PARTITION

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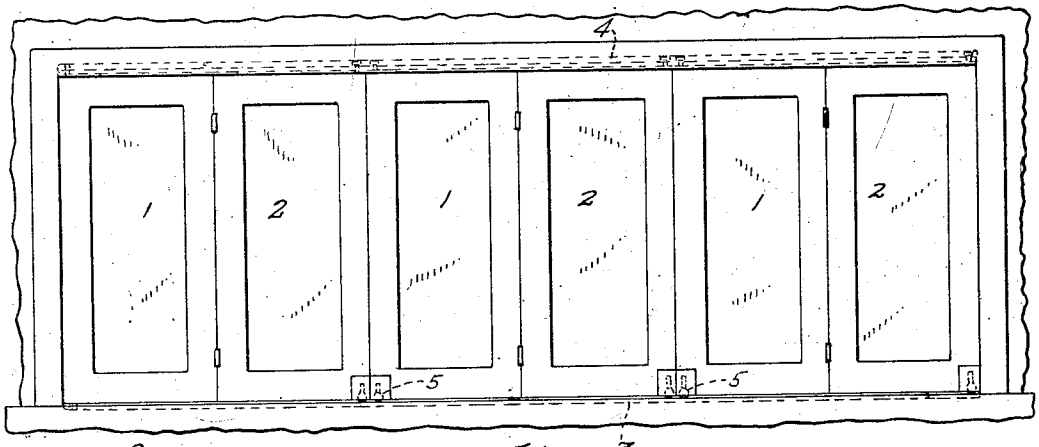


Fig. 1.

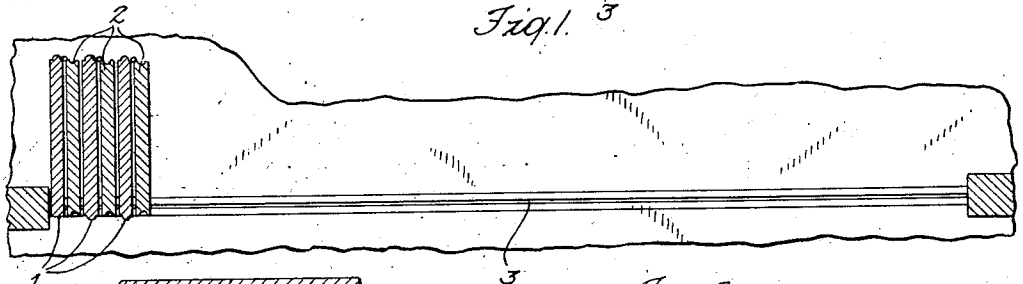


Fig. 2.

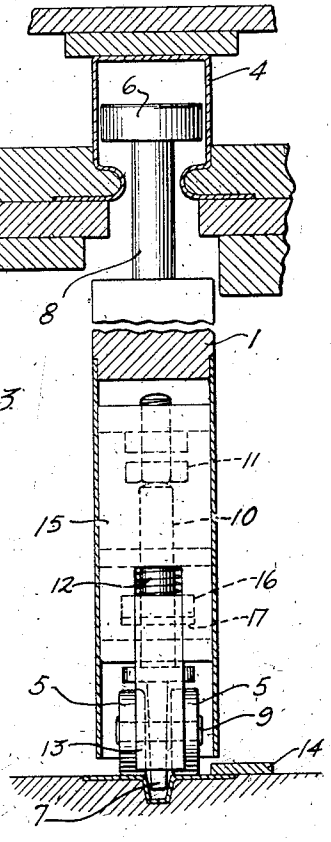


Fig. 3.

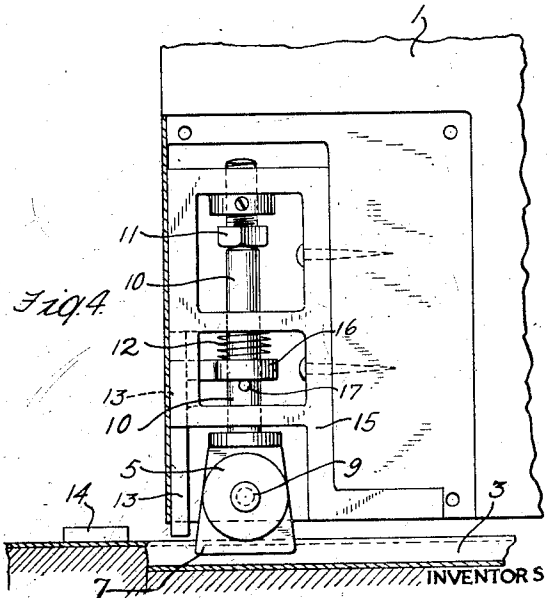


Fig. 4.

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Fig. 6

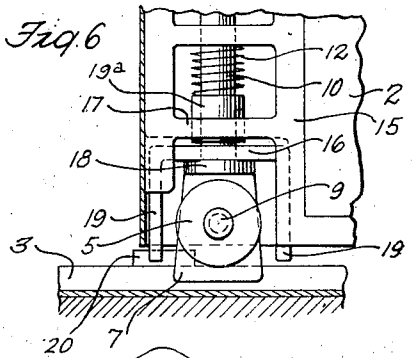


Fig. 7.

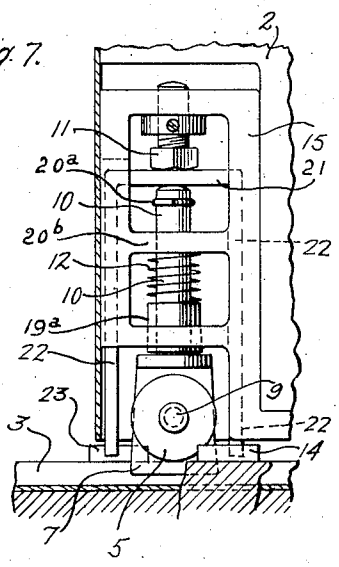


Fig. 5.

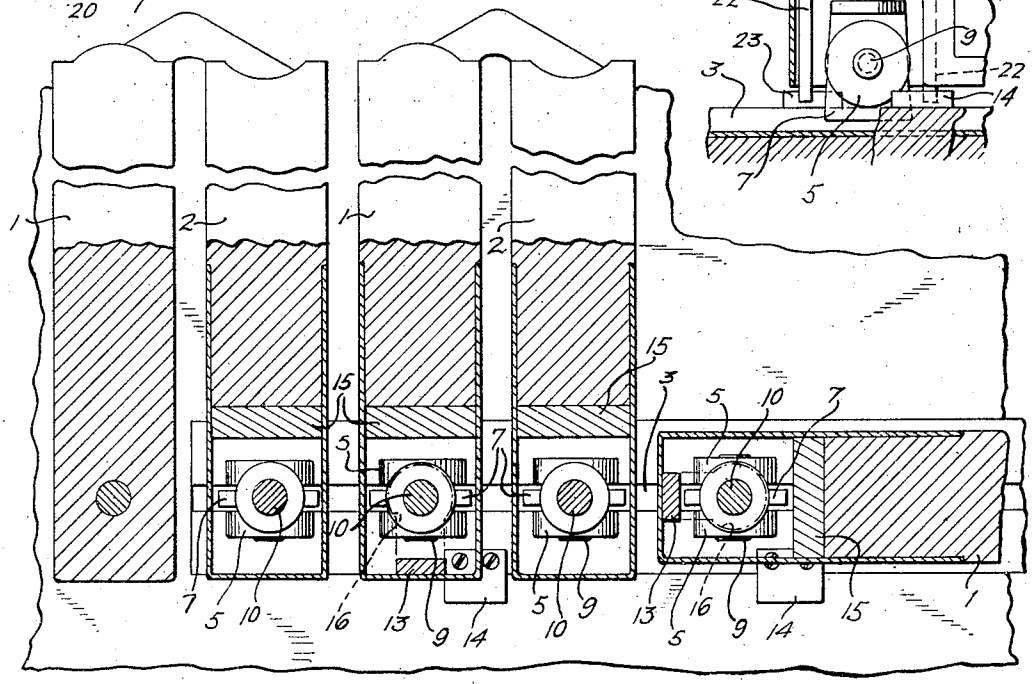
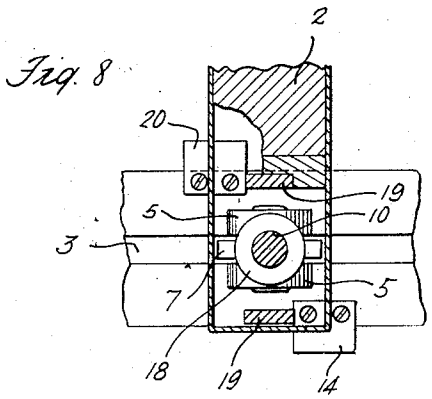


Fig. 8



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UNITED STATES PATENT OFFICE.

HOWARD A. JOHNSON, OF NORFOLK, AND FRANCIS T. ETHEREDGE, OF SOUTH NORFOLK, VIRGINIA, ASSIGNORS TO THE J. G. WILSON CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF VIRGINIA.

FOLDING PARTITION.

Application filed September 26, 1925. Serial No. 58,747.

This invention relates to folding partitions or doors running along tracks or guideways, or more particularly to a construction for preventing movement of the doors along the tracks when the doors are in folded positions.

Large doorways and other openings are frequently provided with folding and sliding doors in the form of hinged sections, each section being composed of two panels or doors. The panels are usually provided with caster bolts and wheels or rollers which run in or on the tracks and permit the sections to slide across the doorway and each of the doors to swing transversely of the tracks. As is well known to those skilled in the art it is highly important that certain of the doors shall be securely locked from movement along the tracks when the sections are folded. This insures a normal regular unfolding of the doors in succession during the closing operation and eliminates danger of jamming and breakage of the parts which often occurs when the doors are not properly locked in position.

It has been proposed in the past to provide the sections with locking means which engage with projections or recesses in the floor or floor track. The prior constructions have been open to various disadvantages. Where projecting floor pins have been used, these are frequently in the way and form dangerous obstacles. Other constructions have been open to the disadvantage that they tend to bind when the sections are folded or unfolded or that they fail to operate properly when the tracks contain vertical irregularities.

It is the object of the present invention to improve the construction and mode of operation of folding partitions and to avoid the disadvantages of dangerous projecting locking pins on the floor and provide a locking mechanism which will operate at all times automatically to lock the panels positively from movement along the track when folded and is substantially unaffected by irregularities in the track.

In carrying out the above object of the present invention, a feature of the invention consists in the provision of a locking device which is movably mounted on one of the doors or panels of the partition and is caused to assume a substantially uniform vertical position with relation to the fixed stop which it is arranged to engage. With this construction, relatively low flat floor stops may be utilized without danger of the locking means overriding the stops as often happens in prior constructions, particularly when the track contains relatively large vertical irregularities. Other and further advantages of the invention will appear from the following detailed description of a preferred form of caster bolt construction which illustrates the features of the present invention. It should be understood that the detailed description is illustrative of one form of the invention only and that the construction is not limited to the mechanical construction therein set forth and that any equivalent means may be utilized to carry out the object of the invention as will appear to those skilled in the art.

The preferred embodiment of the invention will be described more particularly in connection with the accompanying drawings, in which—

Figure 1 is a front elevation of a six panel sliding door with the panels unfolded;

Figure 2 is a horizontal section through a six panel door showing the panels folded;

Figure 3 is a vertical section at right angles to the view in Figure 1, showing the caster bolt construction;

Figure 4 is a vertical section at right angles to Figure 3;

Figure 5 is a longitudinal horizontal section of a partition showing one of the panels in unfolded position and the other panels in folded position;

Figure 6 is a view similar to Figure 3 illustrating a modified construction;

Figure 7 is a view similar to Figure 3 illustrating another modified construction; and

Figure 8 is a view in horizontal section illustrating the positions of certain of the parts shown in Figures 6 and 7 when the panel which carries the same is folded.

The folding partition illustrated in Figures 1 and 2 is composed of three sections which are in turn composed of left and right hand panels 1 and 2 hinged together. The sections when unfolded are adapted to slide in the upper and lower tracks or guideways which are designated by the numerals 4 and 3 respectively. The rollers 5 run on the

lower track and roller 6 which is parallel to the floor and revolves on the bolt 8 runs in the upper track and acts as a guide roller for the panels. The caster bolt 10 is provided with an axle pin 9, and guide finger 7 and is mounted loosely in the frame 15 for vertical and rotative movement. The elevation of the caster bolt is adjustably limited by the abutment screw or bolt 11 engaging the upper end of the caster bolt. The spring 12 acting on the caster bolt maintains the rollers in contact with the lower track at all times. The locking finger or bolt 13 is slidably mounted in guides in the caster bolt frame so that it is capable of vertical movements. The bolt passes through the upper arm 16 of the finger which rides on a pin 17 passing through the bolt 10. As a result, the finger moves up and down with the caster bolt and the length of the downwardly extending arm of said finger is such that the finger at all times clears the track irrespective of irregularities in the level of the track. At points where the panels are to be locked, locking blocks 14 are placed on the floor at a distance such that they are engaged by the locking bolt when the panels are folded.

When the panels are unfolded, the line connecting the center of the caster bolt with the center line of the locking finger 13 is parallel with the lower track as shown in Figures 3 and 5. In this position, the sections are free to slide with the exception of the left hand section, the left hand panel of which is permanently anchored by suitable pivots as is shown in Figure 5. When it is desired to fold the panels, the left hand section is folded, as shown in Figure 5, and the next section is slid along the track until the left hand lower end of the left hand panel passes the block 14 (see Figure 5), its movement then being limited by its engagement with the panel of door 2 of the previously folded section. The doors or panels of the latter section are then folded and the caster bolt frame mounted on the lower left-hand portion of door 1 turns with the door about the bolt 10, swinging the finger 13 in an arc until it engages with the block 14 as is shown in Figure 5. In this position, the door is locked against sliding outwardly or to the right, Figures 2 and 5, along the track and when the section is unfolded, the pull on the door 2 which might otherwise tend to cause door 1 to slide along the track, merely unfolds the two doors, since the door 1 is locked against moving along the track in the direction of pull.

When the section is completely unfolded as is shown at the extreme right of Figure 5, the finger 13 swings clear of the locking block 14 and the unfolded section is free to slide along the track.

It will be seen that the improved caster bolt of the present invention provides automatically for the locking of one panel of each section as soon as it is folded and does not unlock them until they are completely or substantially completely unfolded. When a stop which is vertically fixed on the door is employed this stop will often be elevated, because of vertical irregularities in the track so that it will ride over the stop 14. The locking finger of the present construction, however, is caused to assume a predetermined substantially uniform vertical position with relation to the corresponding stop plate 14, when moved into position to engage this stop plate regardless of vertical irregularities in the track, the position of the finger being determined by the caster bolt and not by the door. This enables the finger to be located sufficiently low to obviate any liability of its riding over the stop plate. The locking finger or bolt is at all times concealed within the door panel and rides on the pin 17 which automatically keeps the finger at the right height above the lower track irrespective of irregularities in the track. The locking blocks 14 are low and flat and do not constitute dangerous projections in the floor. The locking is purely automatic, requiring no supervision or care and does not depend on delicate moving parts. The contruction of the improved caster bolt mechanism is simple and rugged and the door panels themselves effectively protect the locking finger from injury.

In the construction embodied in the modified forms of the invention, shown in Figures 6, 7 and 8, the locking devices are arranged to lock the panels 2 against movement along the track in either direction when the panels are in folded positions. With the exception of the locking devices, the construction arrangement of the various parts of the caster bolt mechanism shown in these figures is the same as the corresponding parts of the caster bolt mechanism shown in Figures 1 to 5 inclusive and have been given the same reference numerals.

In the construction shown in Figure 6, the locking devices comprise a U-shaped member 16 mounted to slide vertically in guides in the frame 15 and have an opening through which the caster bolt 10 passes loosely. This locking member as clearly shown in Figure 6 is mounted in the frame below the lower cross piece 17 of said frame and the caster bolt is provided with an abutment 18 against which this U-shaped member rests. The U-shaped member is provided with vertically extending fingers 19 which engage in suitable guides in the frame 15 and project downwardly to a point adjacent to the floor track. This member moves vertically with the caster bolt, it being normally held in engagement with the

abutment 18 by the action of gravity. The locking member is prevented from moving upwardly along the bolt 10 by a sleeve 19^a secured to said bolt and arranged to slide and turn in a bearing in cross piece 17.

The outer finger 19 of the locking member is arranged to engage a locking block 14, to lock the panel 2 when folded, from movement along the track in a direction away from the adjacent previously folded panel in substantially the same manner as the finger 13 of the construction shown in Figures 1 to 5 inclusive. The inner finger of the locking member 16 which is nearer the center of the panel is arranged to engage a locking block 20, as shown in Figure 8 when the panel 1 is folded.

Thus with the construction shown in Figure 6, the panel 1 when folded will be locked against movement in either direction along the track by the engagement of the locking fingers 19 with the locking blocks 14 and 20.

The locking member shown in Figure 6 moves vertically with relation to the panel with the caster bolt 10 and operates in general in the same manner as and has the advantages of the construction shown in Figures 1 to 5 inclusive.

The construction shown in Figure 7 is similar to the construction shown in Figure 6 except that the locking member is of different dimensions and is mounted in a somewhat different manner. As shown in Figure 7, the downward movement of the caster bolt is limited by a collar 20^a sprung into a groove in the bolt and arranged to engage the cross piece 20^b of the caster bolt frame. The caster bolt shown in Figure 6 is also preferably provided with a similar stop device.

In the mechanism shown in Figure 7, the locking member indicated at 21 is substantially U-shaped and is mounted to slide vertically in frame 15. This locking member is provided with vertically extending fingers 22 engaging in guideways in said frame and extending downwardly to points relatively close to the track with which the casters 5 engage. The locking member 21 extends across the upper end of caster bolt 10 and engages between the caster bolt and abutment screw 11 threaded into the frame. The fingers 22 on locking member 21 are arranged to engage locking blocks 23 and 24 on the floor when the panel 1 is folded. The engagement of the fingers 22 with these locking blocks will lock the panel from movement along the track in either direction in substantially the same manner as the panel is locked by the fingers 19 as shown in Figure 8.

The locking member 21 moves vertically with relation to the panel 2 with the caster bolt 10, said member being held in contact with the upper end of the caster bolt by the action of gravity.

It is to be understood that the invention is not limited to the particular construction and arrangement of parts of the illustrated embodiment of the invention, but that the invention may be embodied in other forms within the scope of the claims.

Having thus described our invention, what we desire to secure by Uuited States Letters Patent and claim is:

1. A construction for folding doors comprising in combination a door, means for supporting the door for sliding and swinging movement; a fixed stop; a stop movably mounted on the door for engaging said fixed stop to limit the sliding movement of the door when the door is folded; and means for causing the latter stop to assume a substantially predetermined vertical position with relation to said fixed stop when carried into position to engage the same.

2. A construction for folding partitions comprising in combination a door, means for supporting the door for sliding and swinging movement; a fixed stop; a stop mounted for vertical sliding movement on the door; a caster also mounted for vertical sliding movement on the door; a track engaged by the caster; and a connection between the caster and the latter stop for causing said stop to assume a substantially predetermined vertical position with relation to said first stop when carried into position to engage the same.

3. A construction for folding doors comprising in combination a door, means for supporting the door for sliding and swinging movement; a fixed stop; a stop movably mounted on the door for engaging said fixed stop to limit the sliding movement of the door when the door is folded; and adjustable means for limiting the movement of the latter stop in one direction with relation to the door.

4. A construction for folding doors, comprising in combination a guideway, a door mounted for sliding and swinging movement along the guideway, a caster bolt frame secured to the door, a caster bolt rotatable and vertically movable in said frame, a locking finger mounted in said frame, for locking the door from sliding movement along the guideway when the door is in folded position, said locking finger being adapted to revolve with said frame about the bolt as a pivot and being capable of vertical movement in the frame, and means for causing the locking finger to move vertically with the caster bolt.

5. A construction for folding doors, comprising in combination, a guideway, a door mounted for sliding and swinging movement along said guideway, a caster bolt forming a pivot for the door, one or more casters

mounted on said bolt, a caster bolt frame mounted on the door and rotatable on the bolt, a locking finger extending downwardly between the bolt and the outer edge of the frame, for locking the door from sliding movement along the guideway when the door is in folded position, said finger being slidably mounted in the frame and capable of vertical movement, and means for maintaining the lower end of the finger at a predetermined level with respect to the caster wheels.

6. A construction for folding doors, comprising in combination a guideway, a door mounted for sliding and swinging movement along said guideway, a caster bolt forming a pivot for the door, one or more caster wheels mounted on said bolt, a caster bolt frame mounted on the door and rotatable on the bolt, an inverted L-shaped locking finger for locking the door from sliding movement along the guideway when the door is in folded position, said finger being journaled on the bolt and mounted in the frame so as to be capable of sliding movement, and a projection on the bolt engaging the upper end of the locking finger to maintain the end of the locking finger at substantially a predetermined level with respect to the caster wheels.

7. A folding door comprising hinged two-panel sections with the lower outer corners of the panels cut away; caster bolt frames mounted respectively in the lower outer corners of the panels; caster bolts journalled and vertically movable in said frames, one or more caster wheels mounted on each of said bolts, means for adjusting the vertical movements of the caster bolts in the frames; an inverted L-shaped locking finger journalled on one of the caster bolts and adapted to slide vertically in the corresponding caster bolt frame, the downwardly extending arm of the finger being positioned between the caster bolt and the outer edge of the frame; and a projection on the bolt engaging the upper arm of the locking finger and positioned so that the vertical arm of the locking finger is maintained at a predetermined level with respect to the floor tracks.

8. A folding partition comprising in combination a ceiling track, a grooved floor track, hinged two-panel partition sections, a journal bolt mounted at the upper outer corner of each of said panels, a bearing roller journaled on each of said bolts, said bolts and rollers engaging in the ceiling track, a caster bolt frame mounted in the lower outer corner of each of the panels, a caster bolt journaled in each of said frames and capable of limited vertical movements therein, one or more caster wheels mounted on each of said bolts, a guide on each of the bolts engaging in the groove in the floor track, an inverted L-shaped locking finger journaled on one of the caster bolts of each section and mounted in the frame between the caster bolt and the outer edge of the frame so as to permit vertical movement of the finger in the frame, a projection on the caster bolt engaging with the upper arm of the locking finger and positioned so as to limit the downward movement of the downwardly extending arm of the finger with relation to the corresponding caster wheel, and a raised block attached to the floor and adapted to engage with the said locking finger when the panel carrying said finger is swung out of a plane parallel with the ceiling and floor tracks.

Signed at South Norfolk, Norfolk, Va., this 18th day of September, 1925.

HOWARD A. JOHNSON.
FRANCIS T. ETHEREDGE.