

March 25, 1958

E. R. HAWS

2,827,957

FOLDABLE PARTITION

Filed July 21, 1954

3 Sheets-Sheet 1

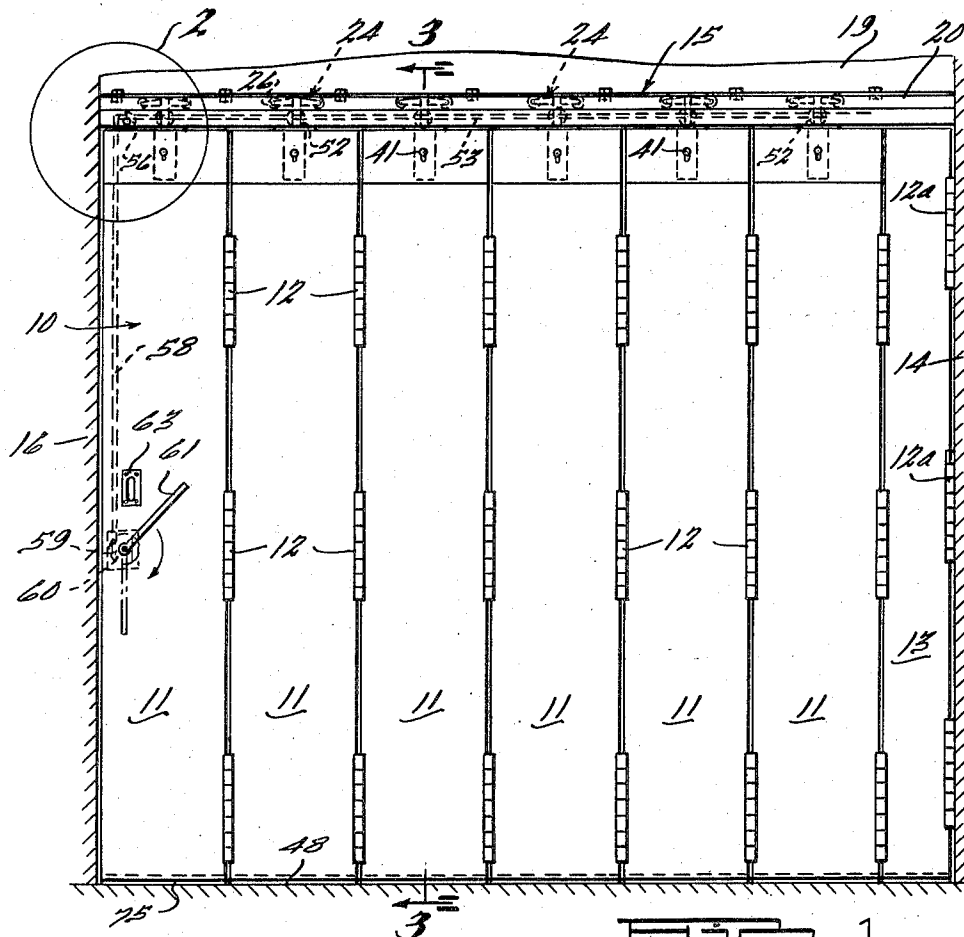


FIG. 1.

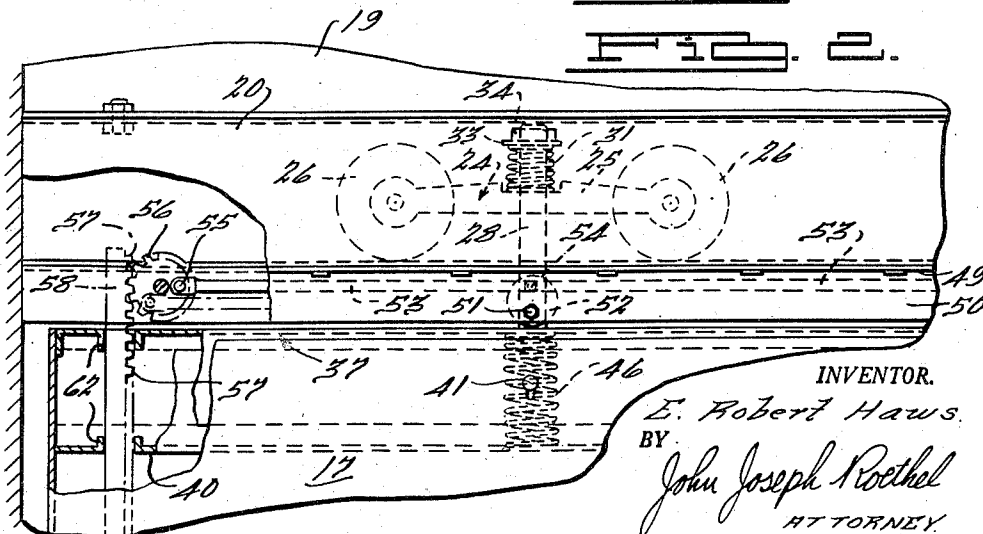


FIG. 2.

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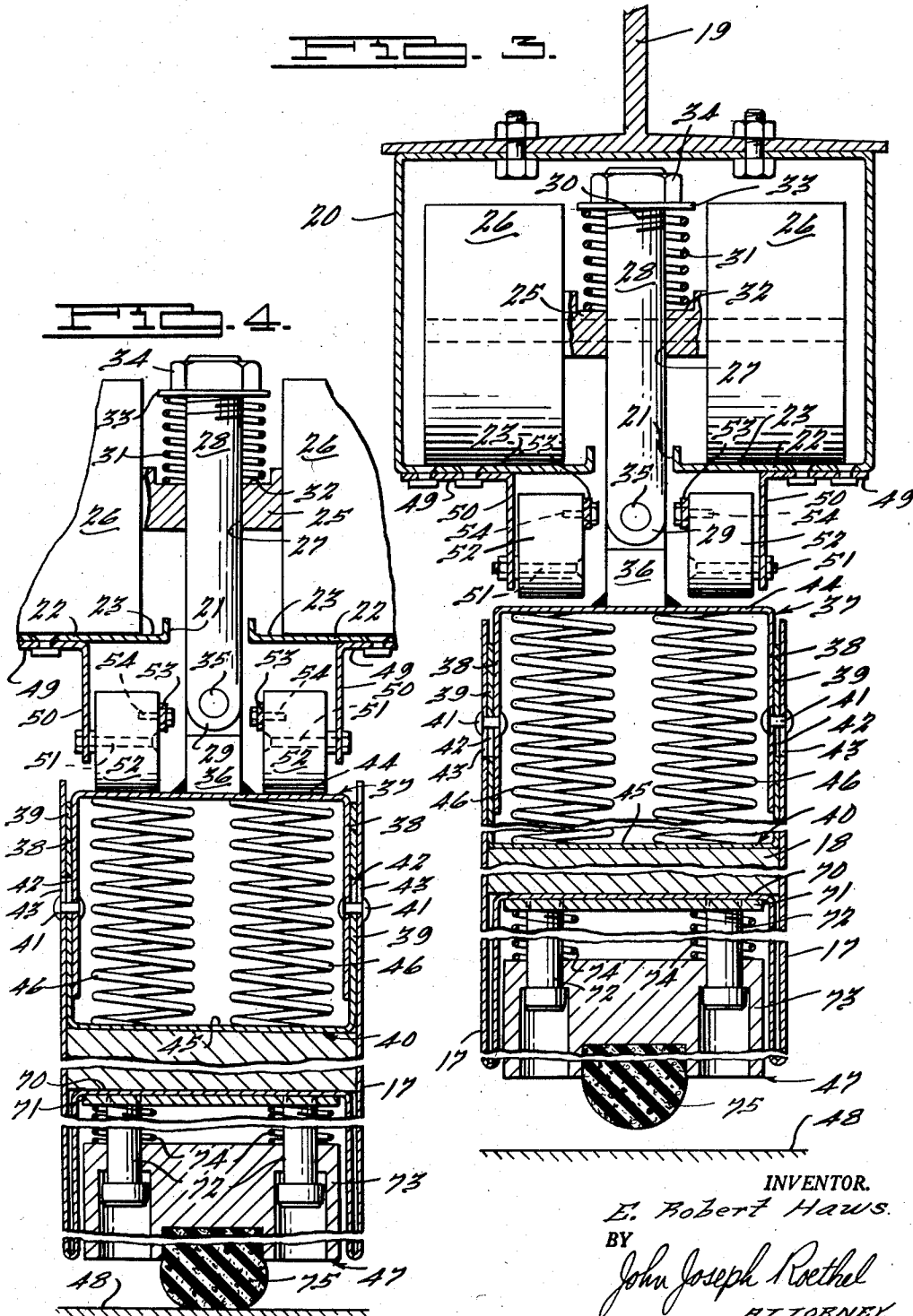
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

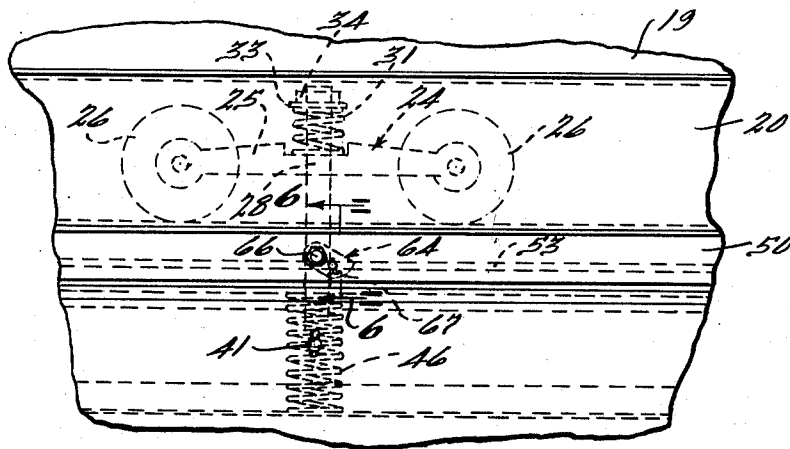


FIG. 5.

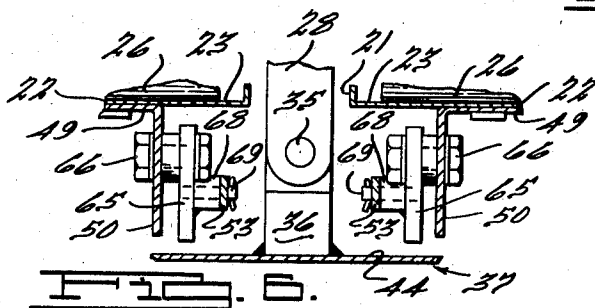


FIG. 6.

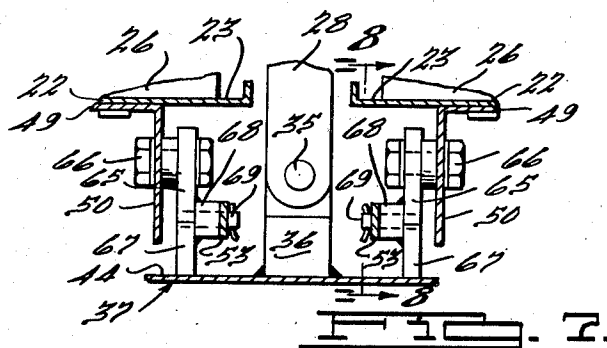


FIG. 7.

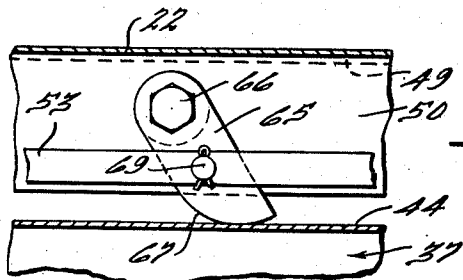


FIG. 8.

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2,827,957

FOLDABLE PARTITION

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4 Claims. (Cl. 160—199)

This invention relates to a folding partition and more particularly to a folding partition comprising rigid panel members hingedly connected to each other and movably suspended at their upper ends from an overhead track but not guided by any track means or the like cooperative with the lower ends thereof.

In a folding partition structure of the type in which the panels are not guided at the lower ends thereof by a track means or the like in the building floor, it is necessary to provide a floor seal adapted to close or seal the space between the bottom of each panel and the floor. The floor seal must be effective to perform at least two functions. First, the floor seal should be mounted so that when each panel is in folded condition the floor seal is out of contact with the floor and remains so until the panels are unfolded to form the partition.

It is an object of the present invention to provide an improved construction and arrangement of a folding partition structure in which the floor seal between the bottom of each partition panel and the floor is maintained in spaced relation to the floor until all of the panels have been moved from a folded to an unfolded condition, at which time an improved mechanism may be actuated to vertically shift the panels a sufficient distance downwardly to bring the floor seal into firm engagement with the floor. In accordance with the improved construction and arrangement the floor seal does not drag on the floor as the panels are folded and unfolded and thus are not subject to friction wear. However, after the panels have been unfolded, sufficient pressure may be exerted on the floor seal to rigidly hold the lower end of each panel against inadvertent lateral movement.

Other objects and features of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

Fig. 1 is a front elevation of a foldable partition as it appears in unfolded condition.

Fig. 2 is an enlarged view of the structure within the circle 2 in Fig. 1.

Fig. 3 is a section taken substantially through line 3—3 of Fig. 1 looking in the direction of the arrows.

Fig. 4 is a view in part similar to Fig. 3 illustrating part of the mechanism in a different operative position.

Fig. 5 is a view in part similar to Fig. 2 illustrating a second embodiment of the invention.

Fig. 6 is a section taken substantially through line 6—6 of Fig. 5 looking in the direction of the arrows.

Fig. 7 is a view in part similar to Fig. 6 illustrating part of the mechanism in a second operative position.

Fig. 8 is a view in part sectional taken substantially through the line 8—8 of Fig. 7 looking in the direction of the arrows.

Before explaining in detail the present invention it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also, it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Referring to Fig. 1 there is shown a foldable partition, generally designated 10, which comprises a series of panels 11 hingedly connected to each other by vertically spaced hinge devices 12. The right end panel 13 is only half as wide as the regular panels 11 and is hinged directly to a building wall 14. The hinge devices 12a holding the right end panel 13 to the building wall must have provision or must be mounted so that the end panel 13 will be permitted to move vertically relative to the building wall 14, for a reason to be hereinafter explained. Also, as will be more fully explained, each of the panels 11 is pivotally and individually suspended from a track, generally designated 15, extending above and across the space between the building walls 14 and 16 respectively.

Each panel 11 as well as the half panel 13 comprises a hollow shell structure having thin walls 17, the walls being of metal, wood, plastic or any other suitable material available in sheet form. The space between the walls 17 is adapted to be filled with any suitable light weight soundproofing material 18.

The overhead supporting structure for the partition 10 comprises an I-beam 19, the ends of which are conventionally supported by the building walls 14 and 16, respectively. Secured to the underside of the I-beam 19 is a channel shaped member 20. As best viewed in Fig. 3, the channel shaped member 20 is a four sided member having a centrally located opening or slot 21 in the lower horizontal wall 22 thereof. The slot 21 extends substantially the length of the channel member 20, the latter being substantially equal in length to the supporting I-beam 19. The inner surface 23 of channel member wall 22 on each side of the slot 21 therein provides a track for a carriage device, generally designated 24.

The carriage device 24 comprises a body member 25 supported at each corner on rollers 26. The body member 25 is provided with a vertical bore 27 at the center thereof, the bore 27 being adapted to be in alignment with the slot 21 in the channel member 20. Pivotally journaled in the bore 27 is a vertically extending rod 28 provided with a clevis portion 29 at the lower end thereof and provided with threads 30 at the upper end thereof. A compression spring 31 is provided which is seated on the upper surface 32 of the carriage body member 25. The compression spring 31 is adapted to engage the underside of a washer 33 surmounted by a nut 34 threaded onto the threads 30 of the rod 28. The compression spring 31 thus yieldably carries the weight of the rod 28 and the panel structure suspended therebeneath on the carriage device 24.

Referring particularly to Fig. 3, the clevis end 29 of the rod 28 has journaled thereon by means of a horizontal pin 35, a vertically extending rod portion 36. The rod portion 36 is welded to the upper surface of an inverted U-shaped channel member 37. The depending legs 38 of the channel member 37 fit within the upwardly extending legs 39 of a second U-member 40. The upwardly extending legs 39 of the second U-shaped member 40 are secured to the panel walls 17 in any convenient manner, such as by spot welding or riveting.

The depending legs 38 of the channel member 37 have horizontally extending rivets 41 extending outwardly therefrom, which rivets project through vertically extending slots 42 and 43 in the upwardly extending legs 39

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of the channel member 40 and the panel walls 17, respectively.

Between the base 44 of the inverted U-shaped channel member 37 and the base 45 of the upright U-shaped member 40 there are provided a pair of compression springs 46. Although two springs 46 are shown, it will be understood that one spring of larger diameter could be utilized. The springs 46 normally urge the two channel members 37 and 40 away from each other so that the weight of the panel 10 is carried on the rivets 41. It will be understood that the weight of the whole assembly, that is, panel 10, channel members 40 and 37, and connected rods 36 and 28, is supported through the spring 31 on the carriage device 24 and thus ultimately on the channel shaped member 20 and the I-beam 19.

At its very bottom each panel 10 is provided with a floor seal, generally designated 47. When the panel 10 and the parts of the supporting mechanism are in the position shown in Fig. 3, the floor seal 47 is spaced from the floor surface 48. It is desirable, after the panels 10 are unfolded to form a partition as shown in Fig. 1, that the floor seal 47 be tightly compressed against the floor 48. When so compressed the floor seal 47 provides a sound barrier and also prevents the panels from swaying when inadvertently bumped or pushed by persons or objects.

An important feature of the present invention is the provision of a positive acting mechanical means for forcing the panels 10 in a downward direction so that the floor seal 47 will be under compression when desired, that is, when the panels are in the position shown in Fig. 1. In the drawings two embodiments of the invention are illustrated for accomplishing the desired result.

The first of the two herein illustrated embodiments is shown in Figs. 1 to 4 inclusive. It will be noted that the channel member 20 has secured to the underside of the lower horizontal wall 22 thereof a pair of spaced angle members 49. The angle members 49 are positioned so that the depending leg portions 50 thereof are spaced inwardly of the outer edge of the channel member 20. Each depending leg portion 50 has journaled thereon by suitable shaft means 51 a roller 52. It will be noted that the rollers 52 are journaled for eccentric rotation. As illustrated, there are a pair of rollers 52 for each panel 11, the rollers being located at each side of the slot 21 in the channel member 20 and overlying the upper surface of the base 44 of the inverted U-shaped channel member 37. The corresponding rollers 52 on each side of the center of the channel member 20 are connected by longitudinally extending links 53. It will be noted in Fig. 2 that the pivot pin 54 in each roller to which the link 53 is connected is diametrically opposite the axis of rotation of the respective roller 52.

Each link 53 is moved to the left or right as desired through a rack and gear mechanism. As shown in Fig. 2, the left end of link 53 is journaled on a pin 55 located near the outer edge of a gear 56. The gear 56 is located in alignment with the center of the channel member 20 and the I-beam 19 and has the end of a link 53 pinned to each side thereof. The gear 56 is adapted to be engaged by rack teeth 57 carried on the end of a vertically shiftable member 58. The vertically shiftable member 58 is supported within the left end panel 11 of the partition 10. At its lower end the member 58 is pivoted at 59 to a bell crank 60, the bell crank 60 being swingable by a handle 61 accessible at the outside of the panel. The upper end of the member 58 is guided by the walls of suitably embossed apertures 62 provided in the bases 44 and 45 of the channel members 37 and 40 utilized in the construction of the left end panel 11.

In operation the partition 10 and the mechanism associated therewith cooperate as follows. It will be assumed that the partition 10 is in folded condition, that is, with the panels 11 parallel to each other and the building

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wall 14. The hand grip member 63 is grasped and the first panel 11 is pulled toward the building wall 16. The panel will be carried by the carriage device 24 and will also swivel about the axis of the support rod 28. As the first panel 11 is moved across the room it will pull the second panel 11 with it, and the second panel will pull the third, and so on until all the panels are in the position shown in Fig. 1. When in such position, the member 58 having the rack teeth 57 will be substantially in peripheral alignment with the gear 56. The handle 61 is then grasped and swung downwardly in the direction of the arrow (see Fig. 1) causing the member 58 to be shifted vertically upwardly. Upon the rack teeth 57 engaging the gear 56, the gear will be rotated in a clockwise direction, as viewed in Fig. 2. The link 53 connecting the gear 56 to the first roller 52 will be pulled to the left, as viewed in said Fig. 2, causing the roller 52 and all the other rollers 52 linked thereto by the respective portions of the link 53, to be rotated in a counterclockwise direction. Due to the eccentricity of the pivot axis of the various rollers 52, the peripheral edge of each roller will engage the upper surface of the base 44 of the inverted U-shaped member 37 and will force the same downwardly against the resistance of the spring 31. Since all the rollers 52 are linked together, all of the panels 11 will be forced downwardly in unison. The hinge structure 12a will permit the right end panel 13 to move relatively to the building wall 14. The downward movement of the panels 11 will cause the door seals 47 to be compressed as shown in Fig. 4.

Since all of the panels 11 are hinged together and are all under the influence of the identical and linked eccentrically mounted rollers 52, all of the panels 11 will be moved downwardly a like degree of movement. However, to ensure that the floor seal 47 will be sufficiently compressed so that it will be firmly in engagement with the floor 48, the eccentrically mounted rollers 52 are permitted to overtravel. That is, they continue to urge the panels 11 therebeneath downwardly well after the point of sufficient compression on the floor seal 47 has been reached.

To prevent the overtravel of the eccentrically mounted rollers 52 from causing the panels 11 to buckle, provision has been made to permit parts of the panel 11 to telescope. As has been explained, the panel walls 17 as well as the upwardly extending legs 39 of the U-shaped channel member 40 are slotted at 42 and 43, respectively, where they receive the rivets 41. This arrangement permits the inverted U-shaped channel member 37 to continue its downward movement even though the panel 11 resists any further movement in a downward direction, the member 37 telescoping within the member 40. The springs 42 are merely compressed until the downward thrust exerted by the rollers 52 reaches its maximum, the handle 61 having reached the dotted line position shown in Fig. 1. Fig. 4 illustrates the respective position of the various elements with panel 11 securely sealed by the floor seal 47 to the floor 48.

To restore the partition 10 to folded condition it is only necessary to swing the handle 61 upwardly thereby releasing the pressure of the rollers 52 on the tops of the various panels 11. The panels will then be lifted by the springs 31 so that the floor seal 47 will be completely clear of the floor 48. The upper end of the shiftable member 58 will drop below the upper surface of the panel 11 in which it is contained and the panels 11 may then be readily shoved toward the wall 14.

The embodiment of the invention illustrated in Figs. 5 to 8 inclusive differs from the previously described embodiment only in the construction and arrangement of the means for exerting downward pressure on the panel 11. In the present embodiment the pressure device, generally designated 64 comprises a short bar 65 pivotally mounted on one end thereof by a pivot stud 66 to a de-

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pending leg 50 of the angle member 49. At the free or swingable end of the bar 65 it is provided with a cam surface 67 adapted to engage the upper surface of the base 44 of the inverted U-shaped channel member 37 in the same manner such surface was engaged by the eccentrically mounted roller 52.

Intermediate the ends thereof the bar 65 is provided with a spacer or boss 68 having a pin 69 secured therein. The pin 69 is adapted to be connected to the link 53 in the same manner as the pivot pin 54 carried by the roller.

The operation of the pressure device 64 is substantially the same as the operation of the pressure rollers of the previous embodiment.

In Figs. 5 and 6, the bar 65 is shown in inoperative position. Movement of the link 53 to the left as viewed in Fig. 5 will cause the bar 65 to be swung downwardly about its pivot stud 66 into engagement with the upper surface of the base 44 of the inverted U-shaped channel member 37 as shown in Figs. 7 and 8. As soon as the bar 65 begins to exert downward pressure the result is exactly the same as occurs when the eccentrically rotatable roller 52 begins to exert downward pressure. That is, the panels 11 are urged downwardly thereby compressing the floor seal 47 into tight engagement with the floor 48.

Reference to the floor seal 47 has only been in general terms. A preferred form of the floor seal is illustrated in Figs. 3 and 4. The lower end of the panel 11 is preferably provided with a recessed bottom plate 70 having a mounting plate 71 secured thereto. The mounting plate 71 is adapted to receive spaced shoulder studs 72 which carry a longitudinally extending member 73. The longitudinally extending member 73 which is substantially equal in length to the panel 11 is yieldingly maintained in spaced relation to the mounting plate 71 by compression springs 74 surrounding the shoulder studs 72. To complete the floor seal, a half round strip of rubber 75 is provided which is centrally located and projects below the lower surface of member 73 in position to engage the floor surface 48.

Thus, with the preferred form of floor seal 47 mounted on the lower end of the panel, sufficient vertical movement of the related parts is provided to ensure a tight engagement of the floor seal with the floor 48. As the panels are forced downwardly by the pressure devices, i. e., the rollers 52 or the members 65, the rubber strip 75 will come in contact with the floor 48. The member 73 will be forced upwardly causing compression of the springs 74. Should the panels 11 be still under downward pressure when the limit of upward movement of the rubber strip mounting member 73 is reached, the telescopic construction and arrangement of the upper end of each panel 11 will prevent damage to the panels.

It will be obvious that the foregoing construction, regardless of which embodiment of the pressure means is used, has several important advantages. The floor seal 47 is not subject to excessive wear as the partition panels are folded and unfolded since the floor seal is out of contact with the floor during movement of the panels 11 across the room. However, when it is desired to compress the floor seal 47, the actuating mechanism provides a device having a high mechanical advantage for exerting downward pressure on the panels 11. Despite the mechanical force available, the telescopic construction and arrangement of the panels 11 prevents any damage to the panels. The various springs, such as the springs 74 yieldably urging the rubber strips 75 downwardly permit compensation for any high or low spots in the floor 48. The result is a tight seal between the lower end of each panel and the floor 48.

I claim:

1. A folding partition structure comprising, in combination, an overhead track, a carriage device movable along said track, a partition panel, suspension means sup-

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porting said partition panel below said carriage device for movement therewith and relatively thereto, said suspension means comprising shaft means swivelly and slidably journaled on said carriage means and a resilient means between said carriage means and a part of said shaft means yieldingly supporting the latter against downward movement, said shaft means being secured to a member yieldingly telescopically connected to the upper end of said partition panel, and pressure means suspended from said overhead means actuable to engage said member to urge the same and said shaft means downwardly against the resistance of said resilient means to shift said panel downwardly, said panel upon engagement with a floor therebeneath causing the upper end of said panel and said member to be telescoped relative to one another.

2. A folding partition structure comprising, in combination, an overhead track, a carriage device movable along said track, a partition panel, suspension means supporting said partition panel below said carriage device for movement therewith and relatively thereto, said suspension means comprising shaft means swivelly and slidably journaled on said carriage means, and a first resilient means between said carriage means and a part of said shaft means yieldingly supporting the latter against downward movement, said shaft means being secured to a member telescopically connected to the upper end of said partition panel, and a second resilient means interposed between said member and a part of said panel, and pressure means suspended from said overhead means actuable to engage said member to urge the same and said shaft means downwardly against the resistance of said first resilient means to shift said panel downwardly, said panel upon engagement with a floor therebeneath causing said second resilient means to be compressed and the upper end of said panel and said member to be telescoped relative to one another.

3. A folding partition structure comprising, in combination, an overhead track, a carriage device movable along said track, a partition panel, suspension means supporting said partition panel below said carriage device for movement therewith and relatively thereto, said suspension means comprising shaft means swivelly and slidably journaled on said carriage means, the upper end of said shaft means extending above said carriage means, a first resilient means between said carriage means and said shaft means upper end yieldingly supporting said shaft means against downward movement, the lower end of said shaft means being secured to a member telescopically connected to the upper end of said partition panel, and a second resilient means interposed between said member and a part of said panel, and pressure means suspended from said overhead means actuable to engage said member to urge the same and said shaft means downwardly against the resistance of said first resilient means to shift said panel downwardly, said panel upon engagement with a floor therebeneath causing said second resilient means to be compressed and the upper end of said panel and said member to be telescoped relative to one another.

4. A folding partition structure comprising, in combination, an overhead track, a carriage device movable along said track, a partition panel, suspension means supporting said partition panel below said carriage device for movement therewith and relatively thereto, said suspension means comprising shaft means swivelly and slidably journaled on said carriage means, a first spring means between said carriage means and said shaft means upper end yieldingly supporting said shaft means against downward movement, said panel being provided with an upwardly opening recessed portion at the upper end thereof, the lower end of said shaft means being secured to a member substantially contained within said recessed portion, pin and slot means connecting said member to the walls

of said recessed portion whereby said panel and member are movable relative to one another, a second spring means interposed between said member and a part of said panel, and pressure means suspended from said overhead means actuatable to engage said member to urge the same and said shaft means downwardly against the resistance of said first resilient means to shift said panel downwardly, said panel upon engagement with a floor therebeneath causing said second resilient means to be compressed and the upper end of said panel and said member to move relative to one another.

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