United States Patent

Sherwood

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[54] **OPERABLE WALL PANEL**

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[52] **U.S. Cl.** **52/64,** 49/127

[51] **Int. Cl.** **E05d 15/26**

[58] **Field of Search** 160/206, 40; 52/64, 122; 49/125, 127, 130

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[57] **ABSTRACT**

An operable wall panel has a header that is spring biased toward the ceiling, spaced latches along one side that are extendable through slots in the stile to lock to pins in an adjacent panel, and a roller in a ceiling track. The panel is raised and lowered along a rod that extends from the roller and through a horizontal bar below the header. One end of such bar is pivoted to the panel and its other end is linked to a vertical side bar that operates the latches. The horizontal bar is also coupled to the header. The side bar is raised and lowered by a cam in the preferred embodiment. When the side bar is lowered, the header is retracted from the ceiling, the latches are retracted into the panel, and the horizontal bar bottoms against the lower end of the rod to facilitate upward movement of the panel so that its lower end clears the floor. When the side bar is raised, the panel settles to the floor, the header is freed to move against the ceiling, and the latches are extended for latching engagement with an adjacent panel. At the upper end of the panel is a pin that is normally biased into the track to keep the panel from rotating while it is being moved along the track, but which is retractable to permit the panel to be swiveled on the rod so as to facilitate face-to-face stacking of panels at one end of the track when the panels are not in use.

15 Claims, 13 Drawing Figures

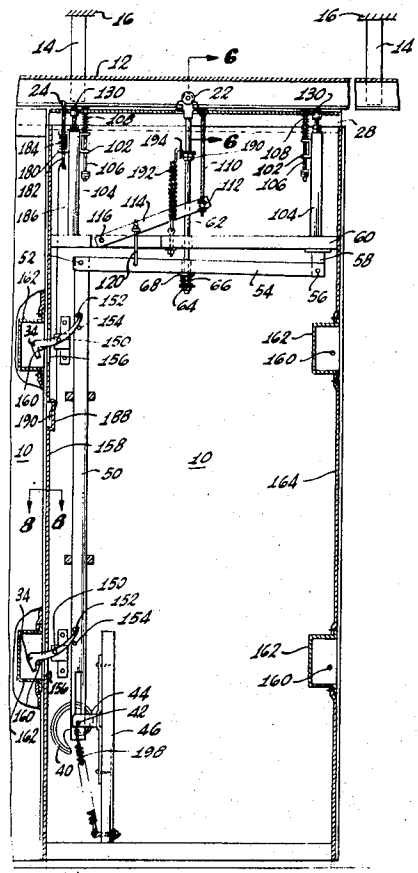


Fig. 1

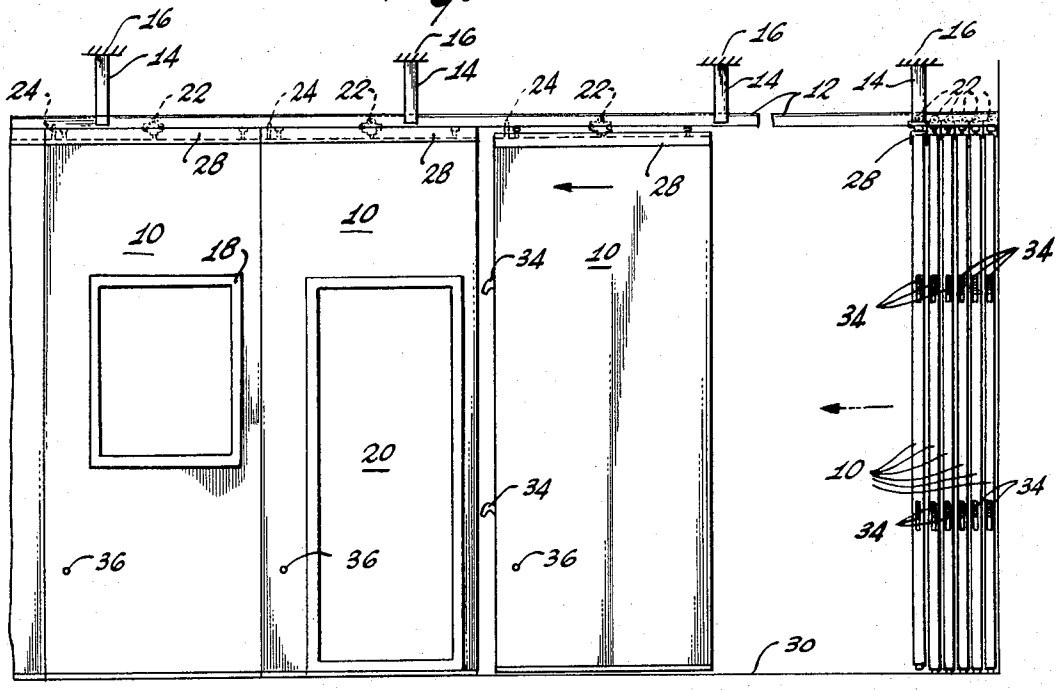
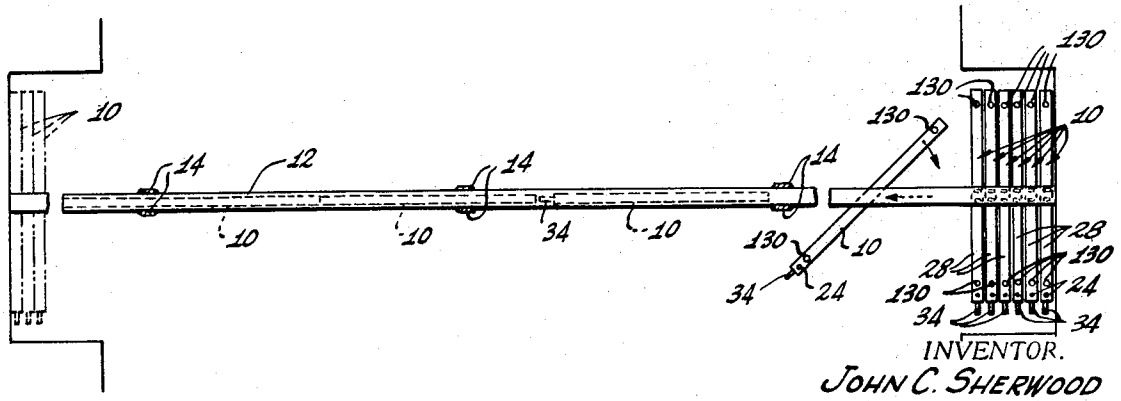


Fig. 2



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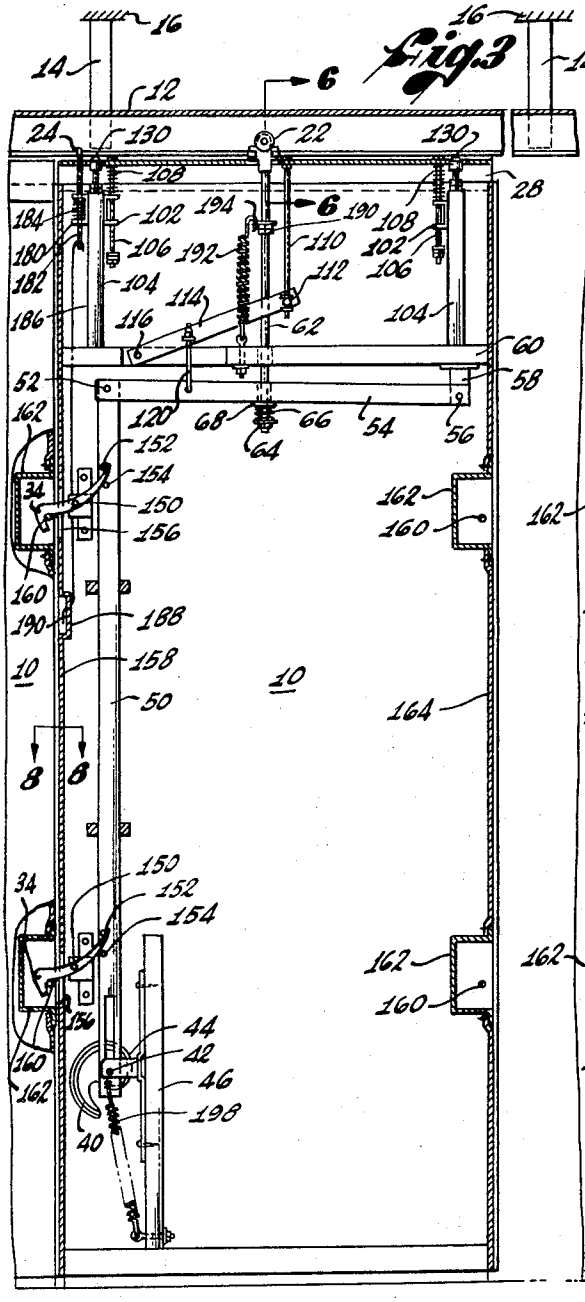


Fig. 3

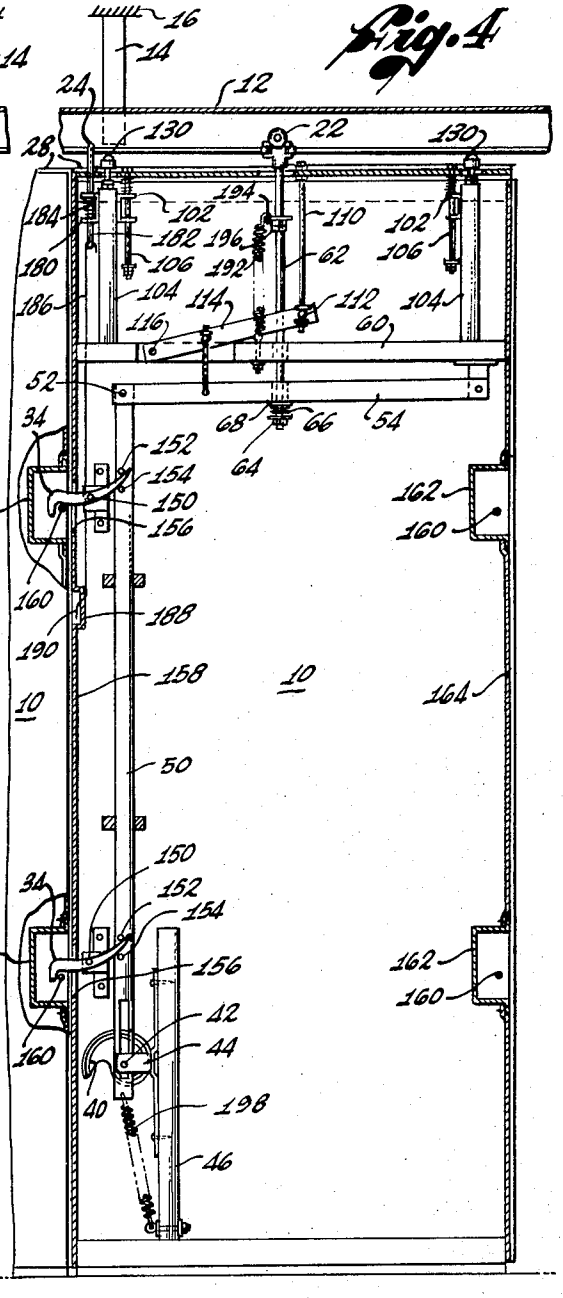


Fig. 4

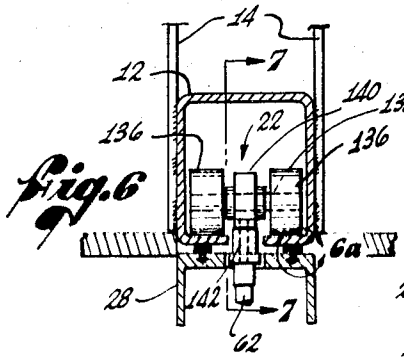


Fig. 6

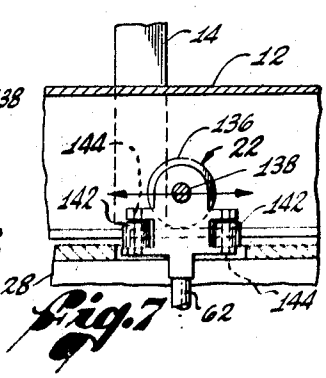


Fig. 7

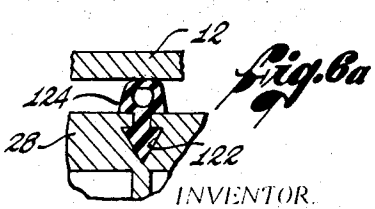


Fig. 6a

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Fig. 5

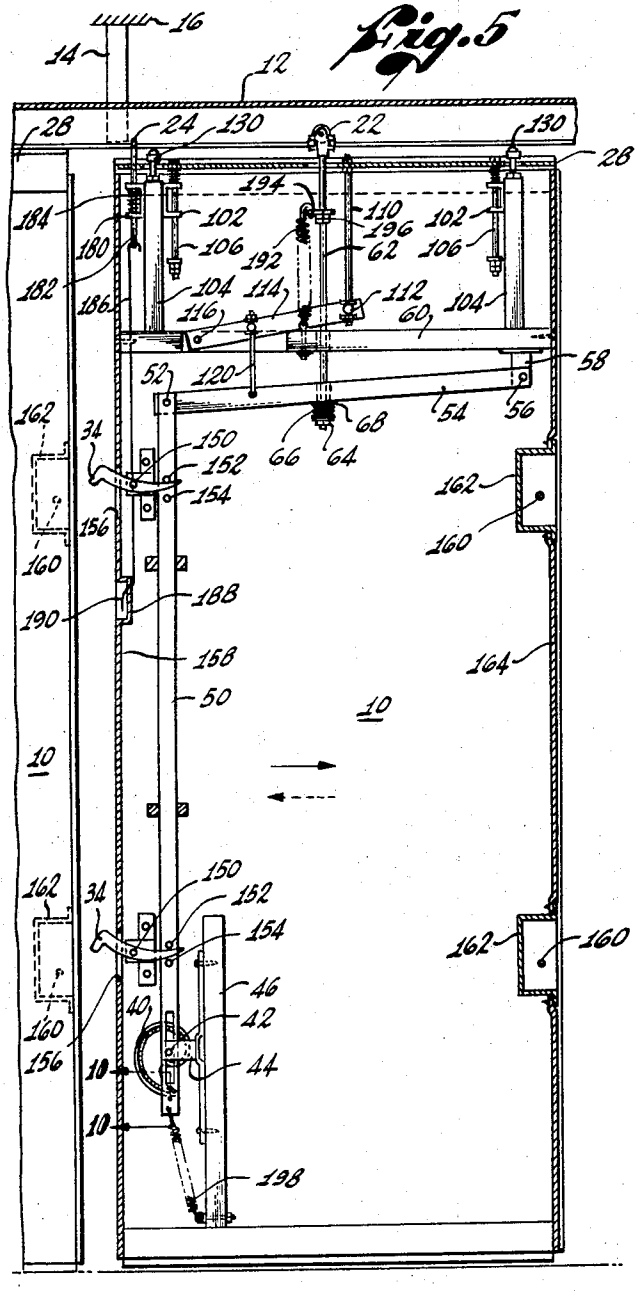
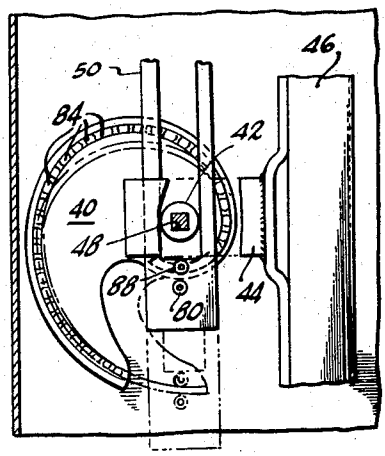


Fig. 9



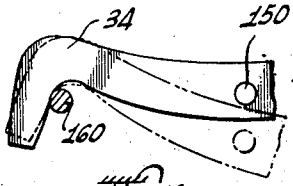


Fig. 11

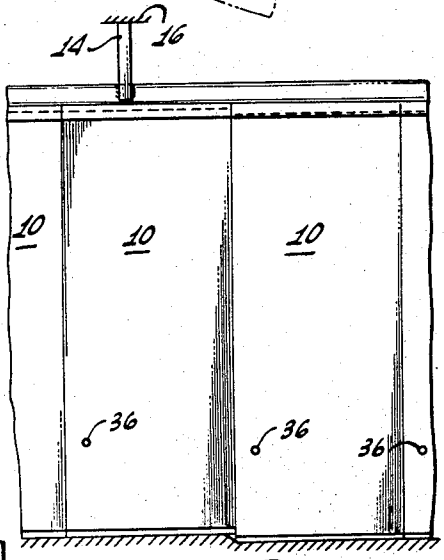
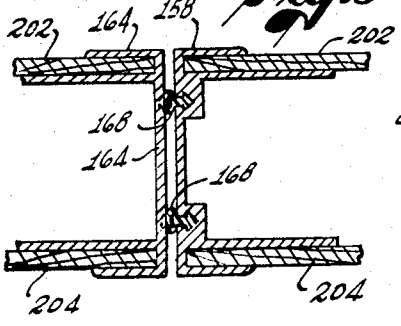


Fig. 12

Fig. 8



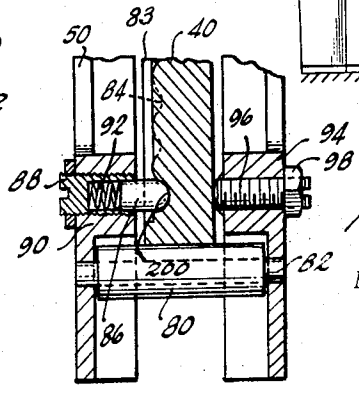


Fig. 10

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OPERABLE WALL PANEL

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to movable wall partitions of the type adapted to be set up side by side to form floor to ceiling wall sections.

2. Description of the Prior Art

In hotels, convention halls, schools and the like, it is frequently desired to divide a single large room into two or more smaller rooms to accommodate different groups of people who wish to conduct different activities at the same time, e.g., different groups of specialists meeting at the same time to discuss problems in their particular areas of interest. In such cases, it is important that temporary wall sections set up for this purpose should provide as effective an acoustical barrier as a permanent wall.

Movable partitions for this purpose are necessarily of substantial size and weight, and means have heretofore been devised to minimize the labor required to move them into place. For example, panels have been constructed with rollers on their lower ends which run in tracks in the floor. In such arrangements, workers must support each panel in an upright position while moving it along the track to the desired position, following which a header at the upper end of the panel is forced upwardly against the ceiling, as by operating mechanism within the panel to which the header is attached. Typically, an opening is provided in the face of the panel to receive a crank for operating the header control mechanism. In other arrangements, means in the panel are provided to retract the wheels upwardly to permit the bottom of the panel to seat on the floor.

There are a number of drawbacks to these arrangements, including the accumulation of dirt and obstacles in the track which impede the desired movement of the panels along the track and desired seating of the lower ends of the panels on the floor. Also, where the edges of adjacent panels are merely butted together, variations in the contour of the floor make it impossible to maintain adjacent panels in face-to-face abutting relation along their lengths.

It is also known to mount such panels from an overhead track, as by rollers at the edges of the upper end of each panel. In such arrangements, resilient strips extend from the lower ends of the panels to engage the floor. These arrangements also suffer the disadvantage that they do not provide adequate acoustical sealing on uneven floors. Moreover, such arrangements constitute tremendous loads on the overhead track and the supporting ceiling structure, which cause deflection in these structures and often prevents the desired positioning and joinder of adjacent panels, and which necessitates expensive general construction of supporting superstructures.

SUMMARY OF THE INVENTION

This invention embraces an operable wall panel which depends from a single carrier movable in an overhead track, and includes means within the panel which is operable to effect limited vertical movement thereof whereby it can easily be moved to a desired position when raised, and released to set on the floor in the desired position. The invention also embraces a header at the upper end of such panel, and means for simultaneously operating the header and panel control means to effect simultaneous sealing with the overhead track and the floor when the panel is lowered, and to free the header from contact with the track when the panel is raised. Also embraced are edge locking and sealing means by which adjacent panels are automatically drawn together in sealing engagement when the mechanism in the panel is actuated to lower the panel. This invention permits a number of wall panels to be supported from an overhead track which is incapable of supporting the combined weights of such panels, and thereby avoids the necessity for building a massive supporting structure of the type heretofore required for overhead pendent panels. Firm sealing engagement with the floor and ceiling is assured despite uneveness in floors, as is continuous edge sealing of abutting panels along their lengths.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a view in elevation of a number of panels of the invention being positioned to form a wall section;

FIG. **2** is a top view of the panels of FIG. **1**;

FIG. **3** is a front elevation view of a panel in position on the floor with its header sealingly engaging the overhead track, with latching elements extending into and locked to an adjacent panel, and wherein a panel face is removed to show the elements for operating the panel, header and latches;

FIG. **4** is a view like FIG. **3**, showing the positions of the parts immediately upon the panel setting on the floor and before the header movement and locking actions;

FIG. **5** is a view like FIG. **3**, showing the positions of the parts wherein the panel is lifted clear of the floor;

FIG. **6** is a fragmentary sectional view taken along the line **6—6** of FIG. **3**;

FIG. **6*a*** is an enlarged fragmentary sectional view of the region indicated at **6*a*** in FIG. **6**;

FIG. **7** is a sectional view taken along the line **7—7** of FIG. **6**;

FIG. **8** is an enlarged fragmentary sectional view taken along the line **8—8** of FIG. **3**;

FIG. **9** is an enlarged plan view of the cam arrangement;

FIG. **10** is an enlarged fragmentary sectional view taken along the line **10—10** of FIG. **5**;

FIG. **11** is an enlarged side elevation view of the end portion of one of the latch elements, showing the element shaped to exert locking force on pins contacted at different points on the element; and

FIG. **12** is a fragmentary front elevation view of adjacent interlocked panels of a wall section to aid in explaining the manner in which the panels are locked in sealing engagement despite unevenness of the floor surface on which they are lowered.

DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

FIGS. **1** and **2** illustrate a plurality of operable wall panels **10** of the invention carried by an overhead track **12**. It is preferred that the bottom of the track **12** be at the level of the acoustical ceiling typically employed in modern structures, and is suitably secured, as by straps **14**, to the permanent ceiling **16**. Each of the panels **10** has the same mechanism located therein, and the parts

of such mechanism are so located that individual panels may be provided with windows and doors as indicated at **18, 20** in two of the panels in FIG. **1**.

In the illustrated arrangement, the panels **10** when not in use are stored at the ends of the track **12**. To facilitate face-to-face stacking of the panels, each is adapted to be swiveled on the track, and to this end each is suspended from a centrally disposed track roller **22**. When it is desired to form a wall section, the panels are successively moved outwardly from the track and swiveled (clockwise as indicated in FIG. **2**) to bring their upper ends parallel to the track. By means hereinafter to be explained, each panel is provided with a retractable pin **24** which is adapted to enter the track and prevent the panel from turning as it is moved to the desired position.

Each panel is provided with a header **28** which is adapted to be moved into sealing engagement with the track **12**. As the panel is moved along the track, its lower end is clear of the floor, indicated at **30** in FIG. **1**, and the header **28** is clear of the track. When the panel reaches the desired position, the mechanism therein is operated to lower the panel onto the floor and to raise the header into sealing engagement with the track. Simultaneously, locking or latching elements **34** in the panel extend into the adjacent panel and lock the panels together in sealing engagement along their lengths.

Operation of the mechanism within a panel is effected through an opening in one of its faces, as indicated at **36** in FIG. **1**. Such opening is adapted to receive a tool for operating a large cam **40** (see FIGS. **3–5**) which is rotatably mounted at **42** on a stationary strap **44**. The strap **44** is shown secured to a block **46** forming part of the panel, but may if desired be secured to or otherwise made integral with the stile at the left edge of the panel.

As best seen in FIG. **10**, the cam bushing has a noncircular opening to matingly receive the end of a crank pin (not shown) inserted through the opening **36** in the face of the panel. By rotating the cam with such a tool, a vertical bar **50** is raised and lowered. At its upper end, the bar **50** is pivotally linked at **52** to one end of a generally horizontal bar **54**. At its other end, the bar **54** is pivoted on a pin **56** that is secured to the panel, e.g., as on the lower end of a short block **58** that is integral with a stationary cross beam or brace **60** that spans the width of the panel. Thus, vertical movement of the bar **50** causes the left end of the bar **54** to be raised and lowered as it pivots on the pin **56**.

In the arrangement shown, the bar **54** and cross beam **60** have aligned openings intermediate their ends through which a rod **62** slidably extends. The upper end of the rod **62** is attached to the roller **22**. A nut **64** is threaded onto the lower end of the rod **62**, and a compression spring **66** is located between the nut **64** and the bar **54**. The spring **66** is a relatively strong spring of only a few turns, and functions as a buffer to prevent damage to the bar **54**. To prevent the bar **54** from directly engaging the spring **66**, a washer **68** may be welded or otherwise secured to the bar **54**. As will be seen from the following description of the operation of the bars **50, 54**, the panel is lowered to the floor by moving the bars upwardly, and is raised from the floor by moving the bars downwardly.

FIG. **3** shows the panel with its lower end resting on the floor, and FIG. **5** shows the panel with its lower end raised from the floor. In FIG. **3**, the bars **50, 54** are raised to their uppermost positions, and the washer **68** is clear of the upper end of the spring **66**. As the bars **50, 54** are lowered, the spring **66** is compressed by the bar **54**, and further downward movement causes an upward force to be transmitted through the pin **56** and block **58** to the cross beam **60**. Such upward force effects upward movement of the panel along the rod **62**.

The extent to which the panel is lifted from the floor is determined by the position of the nut **64** on the rod **62**. The higher the nut is threaded onto the rod, the greater is the clearance of the lower end of the panel from the floor in the lowermost positions of the bars **50, 54**.

The construction and operation of the cam means for controllably raising and lowering the bar **50** will be described with reference to FIGS. **9** and **10** along with FIGS. **3–5**. The lower end of the bar **50** is bifurcated and its braches straddle the cam **40**. Below the cam is a roller bearing **80** that is rotatable on a pin **82** that is staked at its ends in the branches. The rim of the cam rides against the bearing **80** so that when the cam is turned in one direction to increase the radial distance between the bushing **42** and roller **80**, the roller **80** is cammed downwardly, thereby causing the bar **50** to be lowered. When the cam is rotated in the opposite direction wherein such radial distance decreases, the roller **80** follows the cam contour and the bar **50** is raised until the panel sets on the floor.

Thereafter, further upward movement of the bar **50** is effected by utilizing a flange or lip extending from the face of the cam. In the arrangement shown, the front face of the cam adjacent the lip **83** is provided with depressions **84**, and the front branch of the bifurcated end of the bar **50** supports a pin **86** (FIG. **10**) that is slidable in a plug **88** threaded into the front portion of the lower end of the rod **50**, and which is continually biased against the cam face by a compression spring **92** in the plug **88**. When the cam **40** is turned, the pin **86** is cammed into and out of each depression while following the rim **83**.

FIG. **10** also illustrates means to prevent the ratchet pin **86** from moving the cam laterally. For this purpose, a portion **94** is secured to the back leg of the split end of the bar **50**, and a bolt **96** is threaded through the sleeve to engage the back surface of the cam **40**. A nut **98** is threaded onto the outer end of the bolt and against the outer end of the sleeve **94** to hold the bolt **96** firmly against the back surface of the cam. If desired, the back surface of the cam may also be flanged, and the bolt **96** adapted to ride thereon, to aid the similar action of the pin **86** for raising the bar **50**.

Operation of the cam **40** and bars **50, 54** also effects movement of the header **28** into and out of sealing engagement with the track **12**. In this connection, the header **28** is essentially formed of a channel-shaped cap over the upper end of the panel **10**, and which is vertically slidable thereon. The header **28** is biased upwardly, and to this end there is shown spaced brackets **102** that are secured to the panel, as to posts **104** which extend upwardly from the cross beam **60**. The brackets **102** slidably support rods **106** which are fastened at their upper ends to the web of the header. Springs **108**

are positioned on the rods **106** and compressed between the upper ends of the brackets **102** and the web of the header.

Also secured to the web of the header is a rod **110**, the lower end of which is pivotally linked at **112** to end of a bar **114** that is pivoted at **116** to the cross beam **60**. The bar **114** is linked to the bar **54**, and to this end a link element **120** has its lower end secured to the bar **54** and its upper end slidable against the bar **114**. In the uppermost position of the bar **54**, the upper end of the link **120** is clear of engagement with the bar **114**, and the springs **108** move the header **28** against the bottom of the track **12**.

In this latter connection, and referring to FIGS. **6** and **6a**, the web of the header is provided with spaced grooves **122** in which sealing strips **124** are anchored. The upward thrust of the springs **108** is sufficient to cause the strips **124** to be pressed firmly against the bottom of the track **12**.

When the bar **54** is moved to its lower position (FIG. **5**), the upper end of the link **120** engages the bar **114** and pivots it downwardly. The rod **110** is accordingly pulled down, whereby the header **128** and the sealing strips **124** thereon are moved downwardly and clear of the track. The springs **108** are of course compressed, and are thereby conditioned so that upon upward movement of the bar **54** and link **120**, the link **114** is pivoted upwardly and the rods **110**, **106** are thrust upwardly to permit the strips **124** on the header to be brought into engagement with the bottom of the track **12**.

Again comparing FIGS. **3** and **5**, it will be noted that the link **120** engages the bar **114** at a point spaced on its pivot **116** so that slight downward movement of the link **120** effects a substantial downward movement of the end of the bar **114** and the rod **110**. Thus, a substantial mechanical advantage is obtained wherein slight movement of the bar **54** effects a substantially greater vertical movement of the header. In one construction, the links of the associated elements are such that when the bars **50**, **54** are in their lowermost positions (FIG. **5**), the lower end of the panel is spaced approximately 1.5 in. from the floor and the web of the header is spaced 1.0 in. from the bottom of the track **12**. When the cam is operated to raise the bars **50**, **54**, the link **120** releases the bar **114** during the initial portion of the upward travel of the bar **54**, whereby the header is allowed to engage the track before the panel is firmly seated against the floor.

It should be noted that since the panel is carried on a single suspension, i.e., the roller **22**, the panel could cock or "walk," and vibrate as it is moved along the track, and thereby create undesired stresses in the track. However, the buffer spring acts as a cushion to prevent such results, and permits the panel to move smoothly along the track.

Additional means prevent the header from striking the track as the panel is moved along the track to a desired position. As shown in FIGS. **3–5**, spaced bumper casters **130** are mounted on the upper ends of the posts **104** and extend through openings in the header. The casters **130** are positioned so that when the panel is raised from the floor and the header is clear of the track, the tops of the casters extend above the header and are spaced from the track. The casters are positioned along the center line of the header, i.e., between the sealing strips **124** thereon. Accordingly, should the panel be cocked while it is being moved along the track to the desired position, the casters bump against the track and prevent the header from striking the track. When the panel is in the desired position and the control mechanism is operated to lower the panel onto the floor and to release the header for upward movement, the upper surface of the header moves above the tops of the casters and sealingly engages the bottom of the track.

FIGS. **6** and **7** illustrate the preferred arrangement of the track **12** and roller **22**. As shown, the track is an inverted U-shaped element having its lips turned inwardly to provide coplanar rails, and the roller has spaced wheels **136** which roll on the rails. As shown, the wheels **136** are mounted on the ends of a pin **138**, which also extends through a hub element **140** located between the wheels. A part of the body of the element **140** is located between the confronting edges of the rails, and the upper end of the rod **62** is secured to the lower end of the body. The element **140** also carries rollers **142** which are located between the edges of the rails and are rotatable on vertical axes, as on vertical pins **144** that are staked at their ends into spaced portions of the body. The wheels **136** and rollers **142** cooperate to effect movement of a raised panel along the track with a minimum of friction.

As previously mentioned, the latches **34** are utilized for locking adjacent panels together. As best seen in FIGS. **3–5**, the latches are elongated elements which are pivotally supported intermediate their ends at **150**, and which have their inner ends located between a pair of vertically spaced pins **152**, **154**. The outer ends of the latches extend through openings **156** in the stile **158** at the edge of the panel. Inwardly of the edge of the adjacent panel are fixed transverse pins **160** to be engaged by the outer ends of the latches **34**. The pins **160** may, as indicated, be secured in the side walls of housings **162** which have open ends facing the panel edge, and which may be secured to the stile **164**.

When a panel is raised (FIG. **5**), i.e., with the bar **50** in its lowermost position, the upper pins **152** hold the latches **34** so that their outer ends are above the pins **160**. When such a panel is moved into edge abutment with a panel that is seated on the floor, the outer ends of the latches enter the housings **162**. When the cam **40** is operated to raise the bar **50**, the lower pins **154** engage the inner ends of the latches **34** and pivot them downwardly so that their latching ends engage the pins **160**. Further, and referring to FIG. **11** along with FIGS. **3–5**, the latching ends of the elements **34** are contoured so as to contact the pins **160** shortly before the upward travel of the bar **50** is completed, so as to force the pins and latches towards each other in the last portion of the travel of the bar **50**. This action insures that the panels are drawn tightly together and are firmly sealed along their lengths.

In this latter connection, and referring to FIG. **8**, the stile **158** is shown with grooves in its web in which resilient sealing strips **168** are locked. When the panels are drawn together in the manner above explained, the strips are compressed between the faces of the stiles **158**, **164** and effect a firm seal along the lengths of the panels. It should be noted that the latches **34** and the

aligned openings through which they extend in the stiles are located in the portions of the webs of the stiles between the sealing strips **168**.

As previously indicated, the pin **24** is extendible into the track to prevent the panel from turning as it is moved along the track, and is retractable to permit the panel to be swiveled. As shown in FIGS. **3–5**, a U-shaped bracket **180** is secured to the left post **104**, and a rod **182** is slidably disposed in the bracket. The pin **24** is an integral extension of the rod **182**. Between the legs of the bracket, a compression spring **184** surrounds the rod **182** and is compressed between the lower leg of the bracket **180** and a flange on the rod **182** that is normally biased against the upper leg of the bracket. Connected to the lower end of the rod **182** is a wire **186** which extends downwardly and through the back of a cup-like element **188** that is secured to the stile **158**. The lower end of the wire is connected to a ring **190**.

With the above-described arrangement, the pin **24** is normally biased upwardly so that it is located between the edges of the rails. Thus, any tendency of the panel to turn as it is moved along the rail is prevented.

When it is desired to swivel the panel, one grasps the ring **190** and pulls it down, whereby the rod **182** is pulled down against the spring **184** until the upper end of the pin **24** clears the bottom of the track. This is done, of course, only when the panel is raised clear of the floor, and the header **28** is free of the track. It is then a simple matter to swivel the panel on the rod **62**. In this regard, the upper end of the rod **62** may be threaded into the lower end of the body portion of the roller **22**. In such an arrangement, turning the panel at 90° to the track is accompanied by a 90° turn of the rod **62**. Any other suitable means may be employed to permit such swivel movement of the panel, e.g., the rod **62** may be in two parts connected by a universal joint.

The previously described mechanism for raising and lowering the panel is adequate to controllably operate panels of substantial size and weight. In one example, a panel approximately 10 feet high and 4 feet wide employs a bar **54** approximately 3 feet long that is positioned approximately 7 feet above the bottom of the panel, and a vertical side bar **50** approximately 6 feet in length. The weight of such panel and the parts therein is approximately 300 pounds. In such example, the cam **40** is of sufficient size to subject the bar **50** to approximately a 4-in. travel. However, the midportion of the bar **54** moves approximately half that distance between its uppermost and lowermost positions.

As will be appreciated, a substantial force is required to turn the cam **40** in this example. While the parts are arranged so that the weight of the panel is effectively evenly distributed at the ends of the bar **54**, it may be desired to employ spring aids to minimize the force required to turn the cam and operate the linkages. In this connection, a tension spring **192** is shown connected between the cross beam **60** and a washer **194** on the upper portion of the rod **62**. A nut **196** is threaded on the rod below the washer **194** for adjustably positioning the upper end of the spring **192**. A further tension spring **198** is shown connected between the lower end of the bar **50** and the bottom crosspiece **47** (or the lower end of the post **46** thereon). The spring **192** provides a lifting force which assists the upward movement of the panel which the two bar linkage **50**, **54** is lowered, i.e., to raise the panel from the floor. When such linkage is raised, the spring **198** is extended, and serves to provide a restraining force to prevent such sudden upward movement of the linkage as would cause the panel to impact against the floor too sharply.

It is desired that when the panel is in the raised position, the parts are locked in the positions shown in FIG. **5**. In the illustrated arrangement, such locking is facilitated by making the last or outermost depression in the face of the cam **40** somewhat deeper than the other depressions **84**. In FIG. **10**, such deeper depression is indicated at **200**. The pin **86** is cammed out of the depression **200** in the same manner as it is moved out of the depressions **84**. However, a substantially greater force is required to move the pin out of the depression **200**, i.e., the depression **200** is sufficiently deep as to insure that the parts will be held in the positions shown in FIG. **5** until such greater force is applied.

FIGS. **11** and **12** are referred to to explain the utility of the invention for sealingly securing adjacent panels along their edges when their lower ends are seated on uneven portions of the floor. In FIG. **12**, the lower end of the right-hand panel is on a portion of the floor that is lower than that on which the adjacent panel is seated. Referring to FIG. **5** along with FIGS. **11** and **12**, this means that when a raised panel is moved toward edge abutment with an adjacent panel, the latches **34** will engage the pins **160** nearer the ends of the latching fingers than in the situation where the portions of the floor on which the adjacent panels are to be seated are even. However, the fingers are long enough and are contoured so that the desired pull-in forces are exerted even though the vertical distance between the pins and pivot axes of the latches varies considerably, e.g., up to 0.75 in. Thus, the sealing strips carried by the stile **158** (FIG. **8**) firmly and sealingly engage the face of the stile **164** along its length even though the adjacent panels are on portions of the floor that are significantly uneven.

From the foregoing, it will be seen that the panel has a rigid framework formed by the base **47**, the cross beam **60**, and the stiles **158**, **164** secured to the ends thereof. Face panels, indicated at **202**, **204** in FIG. **8**, are secured to the stiles, and to this end the stiles may be formed as conventional aluminum extrusions having edge grooves to receive the edges of the face panels. Such an arrangement permits the panel to be made as a hollow core structure of minimum weight, and to this end the space between the face panels is filled with suitable lightweight honeycomb core material. Also, such material may be arranged to permit conventional insulation material to be placed between the face panels. Therefore, a wall section formed of a plurality of such panels is one which assures optimum acoustical barriers between spaces on the opposite sides of the wall section.

As above noted, operable wall panels made in accordance with the invention may be of substantial size and weight. In the example previously given, it is apparent that in forming a wall section of a plurality of such panels, the track **12** and the ceiling to which it is secured would be unduly stressed by moving all of the panels to the desired positions before lowering them. For example, it may be desired to form a wall section of

20 panels each weighing 300 pounds. The strength of the track may be such that building codes will not permit a load greater than 1,000 pounds to be placed on it. By means of this invention, however, a wall section weighing 6,000 pounds can easily be accommodated. It is only necessary to move no more than three panels along the track at once. In fact, only one panel at a time need be moved along the track and positioned on the floor before moving the next panel, and in such case the track is never subjected to a load greater than 300 pounds.

Operable wall panels made in accordance with the invention are ideally suited to form a permanent wall. For either a temporary or permanent wall, the latches may be eliminated from the panel at one end so as to permit the sealing strips at that edge to engage the wall with which the wall section of the invention is to be joined. Or the walls between which a wall section of the invention extends may be provided with vertical channels or sofits into which the edges of the panels at the ends of the wall section extend.

Operable wall panels in accordance with this invention are also adapted for uses which are not possible with panels heretofore known. For example, the single suspension feature of this invention permits the panels to be seated on a floor in a swiveled position and at any desired angle to the track. Thus, a solid wall can be formed to separate a large room into two smaller rooms for separate meetings, e.g., two school rooms. When it is desired to permit students on both sides of the wall to hear a lecture by a teacher on one side, the panels can quickly be individually raised, swiveled to the desired angle, and then lowered to the floor. The pins **24** in such case may be provided with suitable means to keep them retracted.

This invention embraces other means suitable to perform the functions of the parts described herein. For example, a line and capstan may be used in lieu of the side bar and cam, wherein the lower end of the line is attached to a capstan which is rotated by an external crank to shorten and lengthen the line for lowering and raising the free end of the bar **54**. Such a capstan may be held in any position via a toothed ratchet wheel which can be released to permit reverse rotation of the capstan. Other latch means are also embraced by this invention, as well as other means for raising and lowering the header. For example, latches may be employed which have toggle means for tripping them to snap into and out of their locking positions. The header may be operable directly from the bar **50** or its equivalent, as via gear means. Also, the operable panel lends itself to use without a movable header. In this regard, the upper end of the suspended panel may be inserted in a soffit that extends below the track, so that the upper end of the panel is not exposed in either its raised or lowered positions.

As will now be seen, operable wall panels of this invention avoid the necessity of a perfectly horizontal track in order to insure edge to edge abutment of adjacent panels along their lengths. In known overhead track walls, the track is calculated to deflect to the horizontal when loaded. But settling of the building results in the track varying considerably from the horizontal. This factor, together with naturally existing uneven floor conditions, prevents adjacent panels from being properly sealed together. In fact, such conditions occasionally are so severe that the panels either cannot be moved at all or can be moved only by shoving them with considerable force. Panels of this invention, however, are easily moved and operated to be sealingly engaged with the floor, the track, and adjacent panels, despite such factors.

I claim:

1. In combination:
an upright panel;
a track disposed above the panel;
roller means on the track;
a vertical rod attached to said roller means,
said rod extending into the top of said panel;
and means in said panel for effecting limited vertical movement thereof on said rod, including
means for holding said panel in an upper position wherein the lower end is clear of the floor and for releasing said panel to permit its lower end to set on the floor, including an elongated element pivoted at one end to said panel,
an intermediate portion of said element bearing against the lower end of said rod in a lowermost position of the free end of said element to force said panel to its upper position,
and being in substantial non-bearing engagement with the lower end of said rod in an uppermost position of the free end of said element to free said panel to set on the floor;
and said holding means being operable to move the free end of said element between its lowermost and uppermost positions.

2. The combination of claim **1**, wherein said panel has a rigid framework including
an elongated base,
a horizontal beam a substantial distance from and coextensive with said base,
and respective stiles extending between and secured to the ends of said base and beam;
and wherein said elongated element is pivotally mounted on said framework adjacent said beam.

3. The combination of claim **2**, wherein said stiles extend above said beam;
a header vertically slidable on the upper ends of said stiles;
means normally biasing said header toward engagement with the bottom of said track;
and header control means operable by said panel holding and releasing means to retract said header against said biasing means and clear of the bottom of said track, and to release said header to permit said biasing means to move said header against said track,
said header control means retracting said header when said base is clear of the floor, and releasing said header to engage the track when said base is lowered to the floor.

4. The combination of claim **3**, wherein said header control means is coupled to and operable with said elongated element.

5. The combination of claim **1**, wherein said holding and releasing means includes a vertical element connected to the free end of said elongated element;
and means for operating said vertical element to pivot said elongated element and move its free end between its lowermost and uppermost positions.

6. The combination of claim 3, wherein said vertical element is a bar;

and cam means rotatably supported by said panel,

a portion of said bar engaged by said cam means and movable thereby to raise and lower said bar.

7. The combination of claim 6, wherein said panel has an elongated base, a horizontal brace spaced vertically from and coextensive with said base, and respective stiles extending between and secured to the ends of said base and brace,

said elongated element being located below said brace,

said rod slidably extending through said brace and said elongated element,

the portion of said rod below said elongated element being threaded;

a compression spring on the lower end of said rod;

and a nut threaded onto the lower end of said rod for adjustably positioning said spring.

8. The combination of claim 7, wherein said stiles extend above said brace;

an inverted U-shaped header extending between the upper ends of said stiles,

said header being vertically slidable;

spring biasing means supported by said framework above said brace for normally biasing said header toward said track;

means operable upon downward pivotal movement of said elongated element to pull said header down to a position clear of said track,

said header operating means being operable upon upward pivotal movement of said elongated element to permit said biasing means to force said header into engagement with said track.

9. The combination of claim 8, including

a bar pivoted on said brace with its other end extending above said brace;

a vertical rod secured at its upper end to said header and pivotally linked at its lower end to the other end of said bar;

and a rod link attached to said elongated element and slidable against said pivoted bar,

said rod link being adapted to capture and force said pivoted bar downwardly upon downward pivotal movement of said elongated element,

said rod link being moved to free said pivoted bar for upward movement upon upward pivotal movement of said elongated element.

10. The combination of claim 9, further including spaced latch elements pivotally mounted to said framework adjacent one stile,

said one stile having openings through which said latch elements are extendable,

the other stile having openings aligned with the openings in said one stile;

spaced pins mounted to said framework transversely of and adjacent to the openings in said other stile,

said latch elements being extendable from the openings in said one stile a distance greater than the spacing of said pins from the openings in said other stile,

whereby similar latch elements in another panel may enter the openings in said other stile and lockingly engage said pins;

and means for pivoting said latch elements to unlatching positions when said elongated element is pivoted to its lowermost position, and to latching positions upon pivotal movement of said elongated element to its uppermost position.

11. The combination of claim 10, wherein said latch pivoting means includes spaced pairs of pins carried by said vertical bar,

the inner end of each latching element being located between the pins of a respective pair.

12. The combination of claim 3, wherein said panel in its raised position is adapted to be swiveled on said rod;

a pin supported by said framework and horizontally spaced from said roller;

means normally biasing said pin into said track;

and manually operable means for retracting said pin clear of said track to permit said panel in its raised position to be swiveled to a desired angle with respect to said track,

said elongated bar being movable to its uppermost position to lower said panel in any desired angular position thereof with respect to said track.

13. The combination of claim 12, further including horizontally spaced bumper elements attached to said framework,

said bumper elements being positioned below said track a distance so as to extend above said header in the retracted position thereof.

14. The combination of claim 11, including seal strips along the top surface of said header and the face of one of said stiles.

15. The combination of claim 3, wherein said track has two rails, said roller including a body located between said rails,

said rod being secured to said body;

wheels on said rails rotatably connected to said body;

and rollers between said rails carried by said body.

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