Nov. 14, 1967 F. D. WERNER ETAL 3,352,075

MOVABLE WALL CONSTRUCTION OF PANELS HELD BY CHANNELS AT TOP AND BOTTOM

Filed Nov. 9, 1964 2 Sheets-Sheet 1

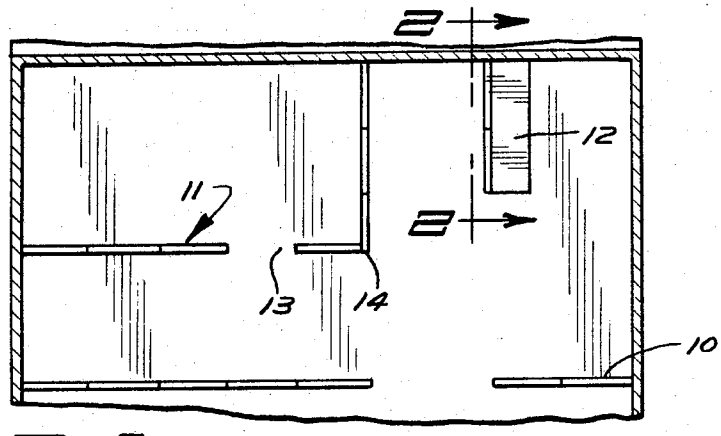


FIG. 1

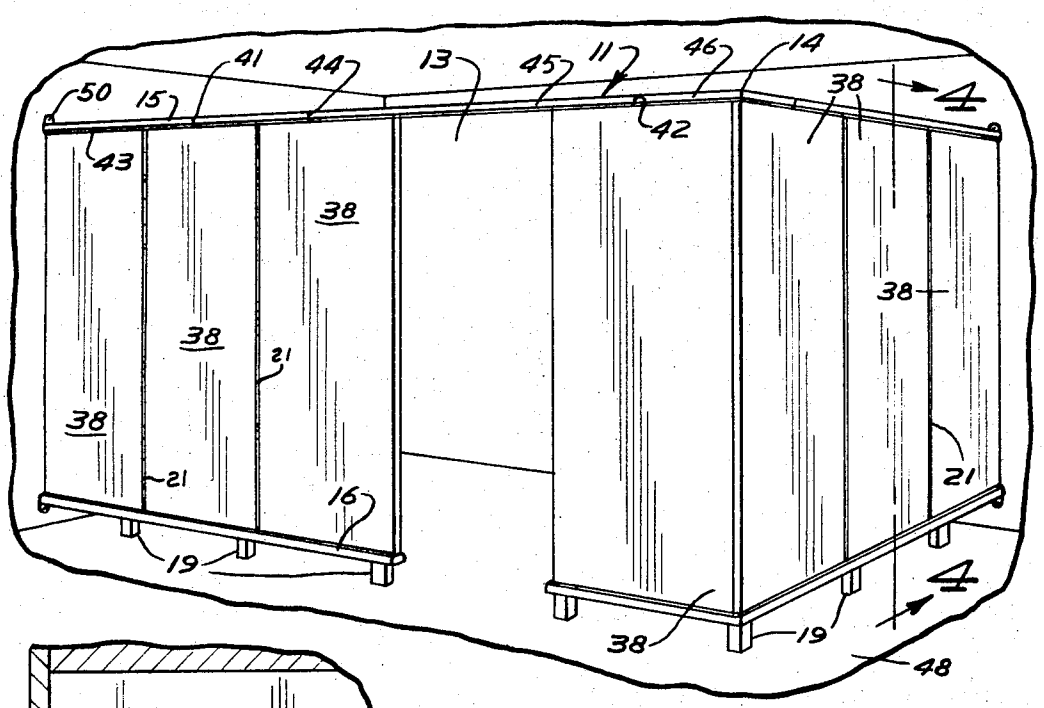


FIG. 3

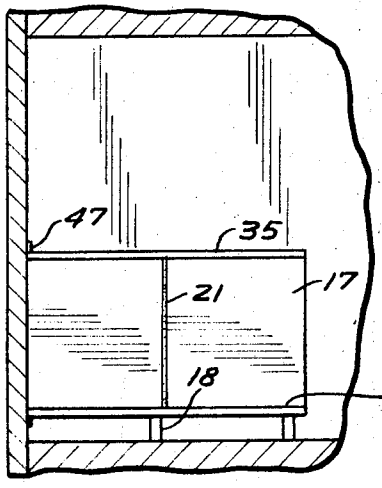


FIG. 2

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FIG. 4

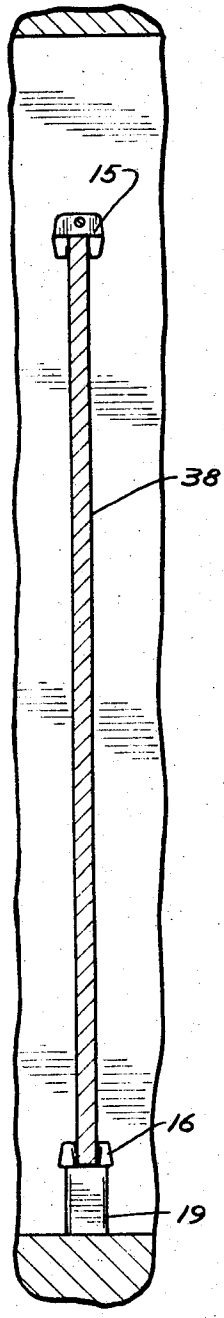


FIG. 5

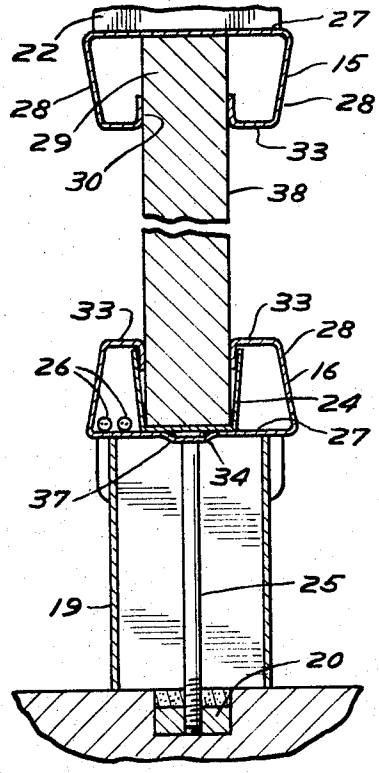
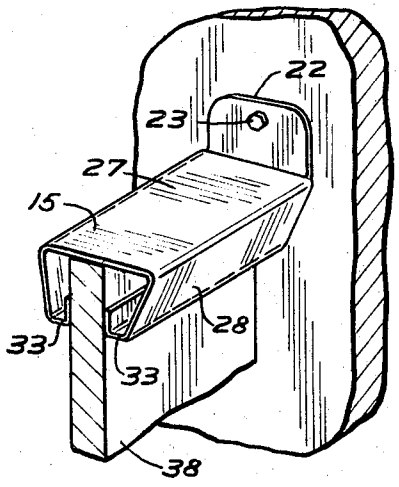


FIG. 8



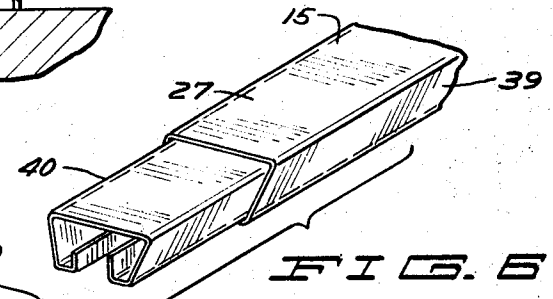
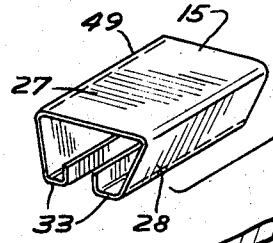


FIG. 6



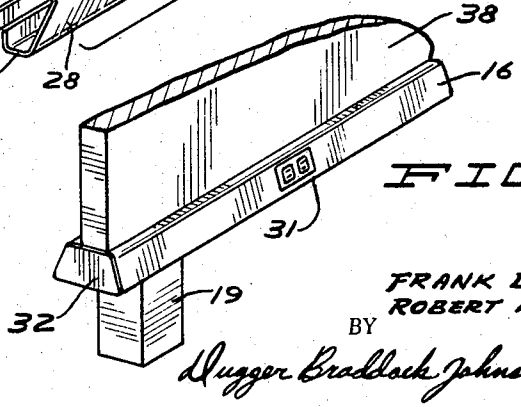


FIG. 7

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MOVABLE WALL CONSTRUCTION OF PANELS HELD BY CHANNELS AT TOP AND BOTTOM

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1 Claim. (Cl. 52—239)

This invention relates to a movable wall construction and more particularly to such a wall having no ceiling support and which may be constructed and moved very easily without alteration of the material and with little expense.

Temporary or movable walls are frequently desired for use in office and factory buildings where the assignment of floor space to various services may from time-to-time require remodeling and alterations of the interior space in the building. Movable walls are frequently needed also for use in overnight alteration of large halls as, for example, convention halls where the halls must be quickly and easily altered to suit the needs of, for example, the exhibitors at a trade convention.

In the prior art, in order to make partition walls of considerable length sufficiently sturdy for normal use, costly and time consuming construction has been necessary. It was necessary either to fasten the walls to the ceiling as well as the floor at periodic intervals, or to provide a heavy rigid support along the bottom of the wall.

When it was desired to move the walls in the prior art, considerable time and expense were required and the materials have almost always been deteriorated in so doing. Similarly, even inserting or removing a doorway required considerable time and expense.

A movable wall constructed according to the present invention may be constructed with a considerable saving in time and expense. The walls will span any distance normally encountered in office or factory needs for temporary walls without requiring any ceiling support whatsoever. The walls may be moved and doors and walkways may be inserted or removed in the wall in a very short time with little or no cutting involved. All of these ends may be achieved and yet the walls may still be suspended several inches above the floor of the building for ventilation and cleanliness.

Walls are constructed according to the present invention from panels which approximate the dimensions of doors. Preferably, regular stock sized of flat-slab doors, either "hollow core" or "solid core" doors, are used. The doors are inserted into rigid channels on both the bottom and top running the full length of the wall. The channels are so constructed that the sides of the channels into which the door panels are inserted have a slight resiliency which enables the channels to hold the panels firmly without the use of nails, bolts, or other means of attachment. The ends of the channels may be attached to the permanent walls of the building, and the bottom channel may be bolted directly to the floor or preferably, supported on short pieces of conduit which act as legs. When short pieces of conduit are used to support the lower channel the wall is raised above the floor, yet the bolt fastenings by which the lower channel is attached to the conduits do not show.

The principal object of this invention is to provide movable walls which may be quickly and easily constructed and which have no ceiling support, to partition open areas and which can be dissembled equally quickly.

It is a further object of this invention, to provide a movable wall construction which allows for quick, easy

and inexpensive movement of the walls from one place to another within a building.

It is a further object of this invention to provide a movable wall construction in which doors can be inserted and removed with very little time, effort and expense.

A still further object of this invention is to provide movable walls which are suspended on short legs above the floor and yet are strong and rugged and do not require ceiling support.

In the drawings,

FIG. 1 is a top plan view of an office area showing walls made according to the present invention used to form several different constructions;

FIG. 2 is a side elevational view of a half-wall viewed as on line 2—2 in FIG. 1;

FIG. 3 shows a perspective view of an office or room formed of the movable wall panels of the present invention;

FIG. 4 is a sectional view taken as on line 4—4 in FIG. 3;

FIG. 5 is a fragmentary enlarged sectional view taken on substantially the same line as FIG. 4;

FIG. 6 is an exploded perspective view of the junction of two channel sections showing a telescoping insert for holding the channel sections together;

FIG. 7 is a fragmentary perspective view of a lower portion of a wall and the wall support; and

FIG. 8 is a perspective view of a member for connecting a movable wall to a permanent wall.

Referring to FIG. 1, a movable wall **10** which may be as much as 25 or more feet in length without any ceiling support is shown. A second movable wall partitioning off an enclosed area is shown at **11**. Each of the walls comprises a top channel **15**, a bottom channel **16** and a number of wall panels **38** held upright between the channels **15** and **16**. A door opening, **13** is bridged by a channel **15** on the top, but is entirely open below. This may be more clearly seen in FIG. 3 where the upper channel **15** runs across the door opening, but the lower channel **16** is cut off to provide the opening. Since the panels **38** are of standard interior door size, it will be observed that the panels are sufficiently high so that the top channel **15** will be well above the head of anyone walking through the door opening.

FIGURE 4 shows an end view of a movable wall viewed along the line 4—4 in FIG. 3. The same view is shown enlarged in FIGURE 5. Each of the channels **15** and **16** are formed identically in cross section and have a flat base **27** which is substantially greater in width than the thickness of the wall panels **38**. Preferably the base **27** is twice as wide as the panel is thick. The channel side walls **28** are somewhat higher than the thickness of the panel **38** and extend upwardly from the base and converge somewhat. Head pieces **33** are joined to the walls and extend toward each other and in a plane parallel to the base **27**. The head pieces are spaced a sufficient distance from the base **27** to provide effective support for the wall panels **38** when the panels are inserted in the channel. The channel edge portions are then bent downward toward the base to form walls **30** defining an open topped groove **29**. The groove **29** is usually constructed to have a width somewhat less than the thickness of wall panels **39**. The groove defining walls **30** are held tightly against the panel **38** in the channel by the natural resiliency and the inward convergence of the channel side walls **28**. The groove walls **30** terminate in spaced relation to the base **24**.

FIGURE 3 shows the walls **11** in perspective. In constructing the wall, small sections of conduit (as shown square tubes) which comprises legs **19** are placed at intervals along the floor **48** where the movable wall will

be fastened to the floor. The lower channel 16 is laid on top of and supported by the legs 19. In the method of construction shown, a nut 20 is fastened to a recess in the floor by known methods, such as adhesives. A series of dents 34 are made in the base 27 of the channel 16 at spaced intervals. A hole is drilled in the bottom of each of the dents 34, and a bolt 25 is inserted through the hole through the aligned leg 19, and fastened to the nut 20. The dents 34 provide recesses for the heads 37 of the bolts 25 so the heads do not interfere with the panels 38 in the lower channel. Door sized panels 38 are then inserted in the lower channel 16 as shown.

The panels 38 are positioned side by side in the channel 16. Resilient spacers 21, which may be strips of sponge rubber, compressible tubing, or other conformable material are inserted between the abutting longitudinal edges of the wall panels 38. These spacers permit proper fitting of the panels to achieve the desired wall length with a relatively large tolerance in panel width. The spacers are wide enough to conform to any irregularities in the panel edge to close what would otherwise be cracks between the panels. The spacers are fastened to one panel and are compressed against the other panel of each abutting pair. In addition, the spacers 21 dampen wall panel vibration and help to reduce sound transmission through the walls. Finally, the upper channel 15 is placed on the top of the wall panels 38 as shown.

The channels 15 and 16 are made in sections of standard length and if more than one length is necessary two channel sections are placed end to end. The lower channel sections comprising channel 16 are held properly aligned by the support legs 19 and the wall panels 38, which are inserted in the channel groove. The upper channel 15 is held onto the panels 38 simply by the sides of the panels 38. The upper channel is also fastened to the main wall of the building at its ends, or to another channel, as at corner 14. The channel sections are cut to lengths so that all joints between channel sections fall near the center of a wall panel. The panels will thus be held in a common plane and will not cock or skew.

Referring to FIGURE 3, one end of a channel section 43 of the upper channel 15 is attached to a wall as at 50. The channel section extends one and one-half panel widths to channel joint 41 in the center of the second panel 38. Successive channel sections 44 and 45, are placed end-to-end along the top edge of the wall. It will be noted that in this construction each channel joint falls in the center of a panel, giving maximum support between the panels. A corner section 46 is constructed with the distance from the corner 14 to the channel joint 42 one-half a panel wide.

It is frequently desired to give additional support to the channel joints rather than merely butting the sections together. Such additional support may be provided without employing a permanent mechanical junction between channel sections by using a telescoping insert 40 as shown in FIGURE 6. The insert 40 is made with outside dimensions slightly less than the inside dimensions of the channel section 39. The groove of the insert 40 is wide enough to let the walls defining the insert groove pass outside the walls 30 of the main channels. The insert is made about six inches long. One end of the insert 40 is slid in the end of one channel section 39. Then the adjoining channel section 49 is slid over the other end of the insert 40. This arrangement holds the adjacent channel sections firmly and rigidly together. This construction is strong and yet it avoids the disadvantage of fixedly attached channels which require considerable time and effort to construct.

FIGURE 8 shows a simple bracket 22 with a single bolt 23 which is commonly used to attach the end of the movable channel to the building wall. The bracket is fastened to the channel it supports in any suitable manner.

The corner section 46 is made by cutting two pieces of the channel on a miter and welding them together to form a 90° angle. The corner piece 45 uses two very short channel pieces running only one-half the width of the two panels 38 at the corner. Then when it is wished to remove a corner and provide a straight wall instead, the corner section may be removed and straight channel sections added to the erected portions.

Where the channel sections are butted together, if the channel sections run to the middle of the panels 38, the joint will be nearly as strong as a continuous long channel. This is because the slight inward taper of the walls defining the panel holding groove in the channel gives a resiliency which binds the channel very tightly to the sides of the panel in the channel. Thus the panels serve as couplings to couple the abutting channel section end to end.

It is frequently desired to run electrical and telephone wires along the temporary or movable wall. If the wires are simply placed within the bottom channel 16 they may be damaged, broken or shorted against the channel walls when the panels 38 are inserted and removed. In order to protect the wires from damage a U-shaped liner 24 is placed within the channel 16. The legs of the U extend upwardly as shown and are positioned on the outer sides of the groove defining walls 30 of the channel. Electrical and telephone wires 26 may be strung along the channel between the legs of the liner 24 and one of the side walls 28. At periodic intervals, holes may be stamped in the side walls of the channels to provide for electrical outlets 31 as shown in FIGURE 7 or for telephone jacks as desired.

The support legs 19 may be any kind of spacer desired. For economy, they are usually hollow and for aesthetic purposes they are usually rectangular with rounded corners as shown in FIGURE 7. Where channels terminate, such as at a doorway or the end of a cantilevered wall, a cap 32 may be placed over the end of the channel. This cap keeps foreign objects out of the channels and is aesthetically appealing.

Referring again to FIGS. 1 and 2, a half-wall is shown at 12. This half-wall, as shown in FIG. 2, is constructed by cutting the door panels in half along the transverse dimension and running the upper channel 35 along the top edge of the half-panels 17. The upper channel 35 is fastened to the main wall as at 47. The lower channels may be directly attached to the floor at periodic intervals or legs 18 may be provided as shown. The fasteners may be either bolts, nails, or other means. Half-walls, constructed as shown in FIGURE 2, are particularly useful for receptionist areas, counters, or constructions where it is desired to have the top half constructed of glass.

It has been found desirable to use extruded aluminum for the channels 15 and 16. The panels 38 consist of standard doors 6 feet 8 inches high and 1.375 inches thick. Painting increases their thickness so that when the door panels are inserted in the grooves 29 they spread the groove slightly and are held firmly in place.

With this construction, it was found that walls extending 25 feet from one permanent wall to another in the manner of wall 10 in FIGURE 1 were sturdy and resisted movement from the normal bumping and knocking found in factories. Further, they were held firmly and did not rattle or otherwise generate noise from surrounding vibrations. The channel side walls by sloping inwardly toward each other are resilient and provide the gripping action. In addition, the sponge rubber spacers 21 used between the panels helped to reduce noise transmission from one side of the wall to the other as well as providing adjustment in the total length of the wall if this becomes necessary.

The only fixed attachements for the movable walls are the legs 19 and the places where the top and bottom channels attach to the building walls. This makes the walls easy to erect, easy to change in length and easy to disassemble.

What is claimed is:

A movable wall construction comprising an upper channel and a lower channel, each provided with a groove and each comprising at least one channel section, a plurality of panels, the bottom of each panel being inserted in the groove of said lower channel, and the top of each panel being inserted in the groove in said upper channel, a plurality of legs, said legs being deployed in a vertical position under said lower channel, each of said channel sections comprising a single piece of metal and having a base, two side walls, two head pieces and two groove defining walls, said base having a width more than twice the thickness of said panels, each edge of said base integrally joined to one of said side walls, said side walls each being integrally joined to one of said head pieces, said head pieces running parallel to said base in a plane distant from said base by at least the thickness of said panel, said head pieces extending a short distance toward the plane defined by the perpendicular bisector of said base, the head pieces each being integrally joined to one of two groove defining walls, said groove defining walls being perpendicular to said base and equidistant from the plane defined by the perpendicular bisector of said base, said groove defining walls being spaced from each other a distance substantially equal to the thickness of said panels, and an inner U-shaped liner inside said lower

channel, said liner having a base and a pair of spaced parallel legs attached to the base, the base of said liner resting on the base of the lower channel and the legs of the liner extending toward the head pieces and being positioned outside of the groove defining walls and touching the groove defining walls.

References Cited

UNITED STATES PATENTS

1,803,589	5/1931	Bohnsack	52—241
1,960,575	5/1934	Davison	52—238 X
2,105,588	1/1938	Davis	52—241
2,682,087	6/1954	Siering	52—242 X
2,904,991	9/1959	Vaughan	52—242
3,189,135	6/1965	Slowinski	52—241
3,195,698	7/1965	Codrea	52—239

FOREIGN PATENTS

537,790	1/1956	Italy.

OTHER REFERENCES

Penn Metal Co., Inc., Publication, rec'd in Patent Office July 2, 1962, A.I.A. File No. 35–H–6 pages 1, 5.

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