March 2, 1971 W. B. DICKSON 3,566,559

DEMOUNTABLE WALL STRUCTURE

Filed Dec. 23, 1968 2 Sheets-Sheet 1

FIG. 1.

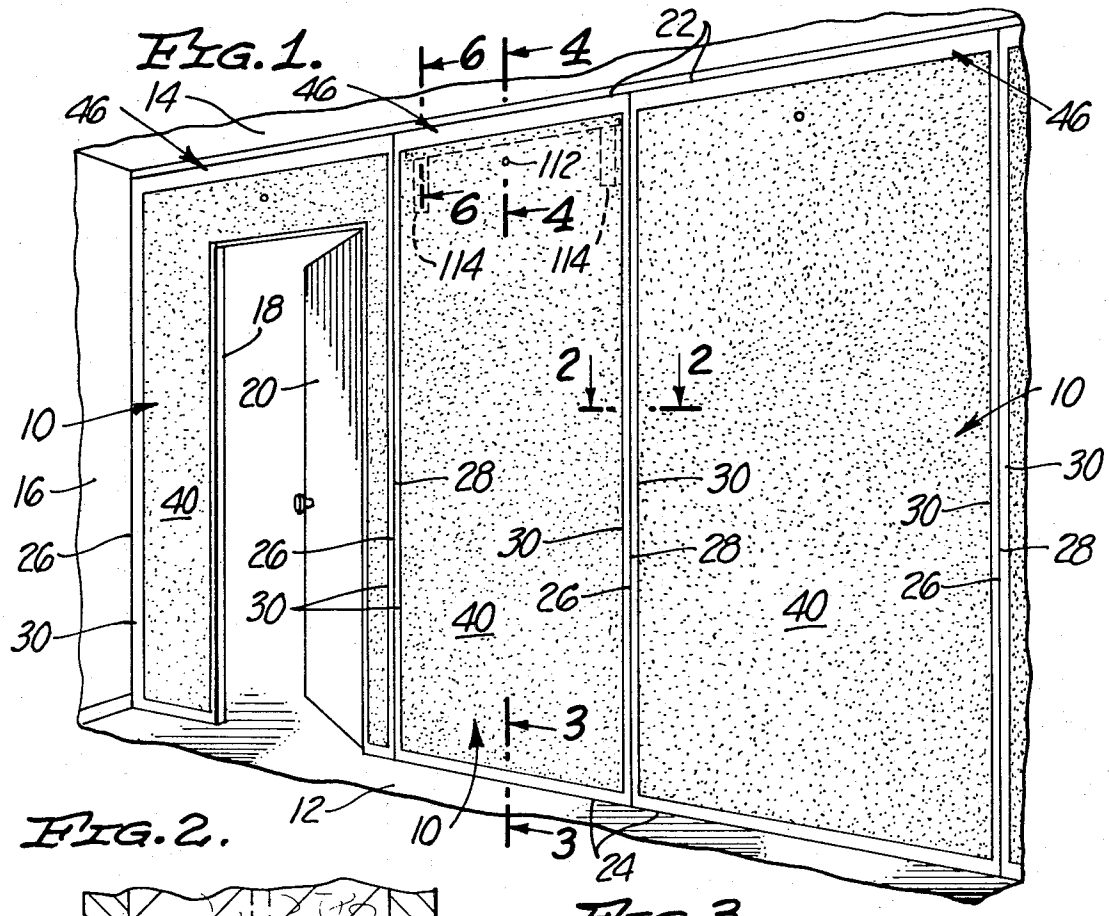


FIG. 2.

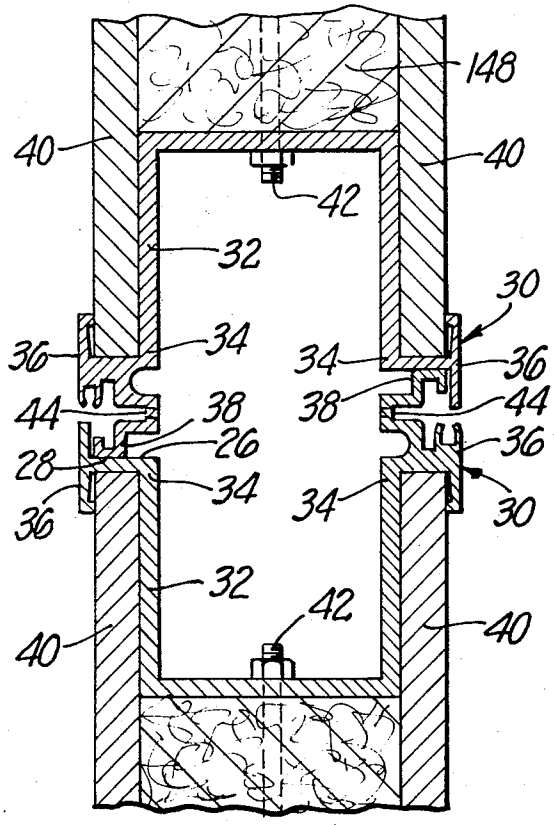
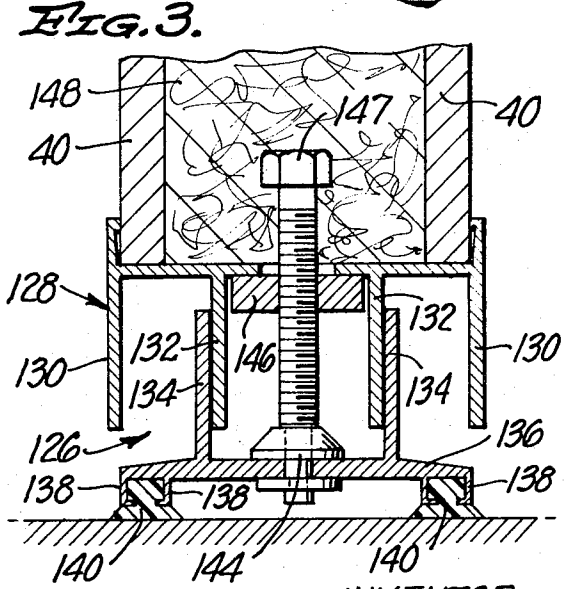


FIG. 3.



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FIG. 4.

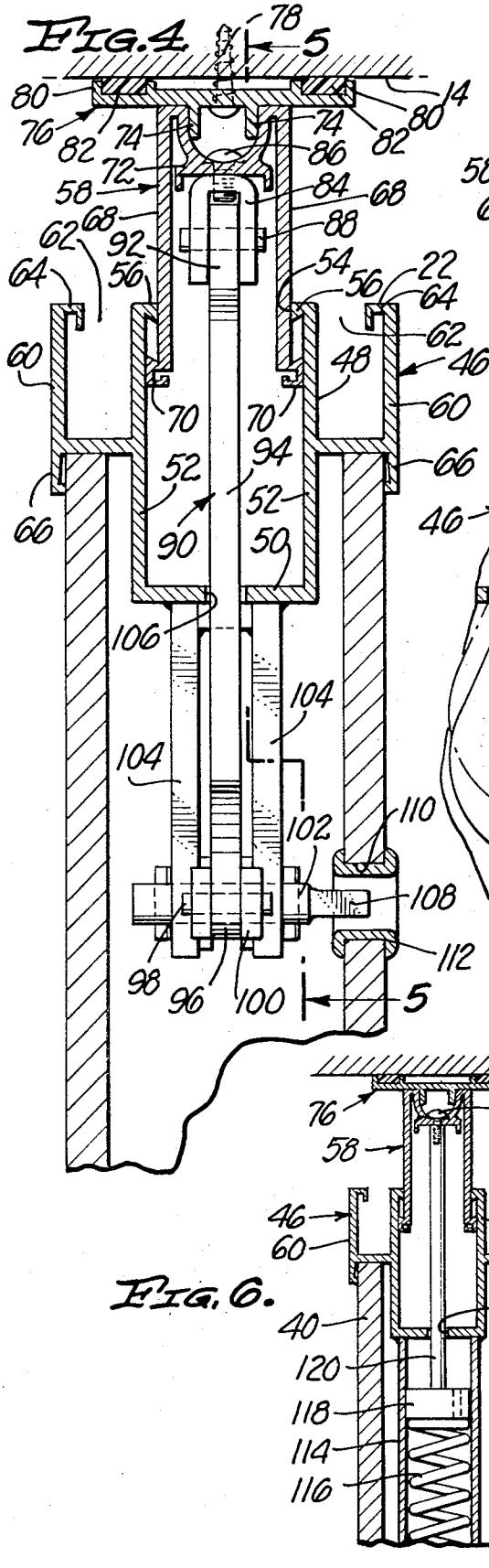


FIG. 5.

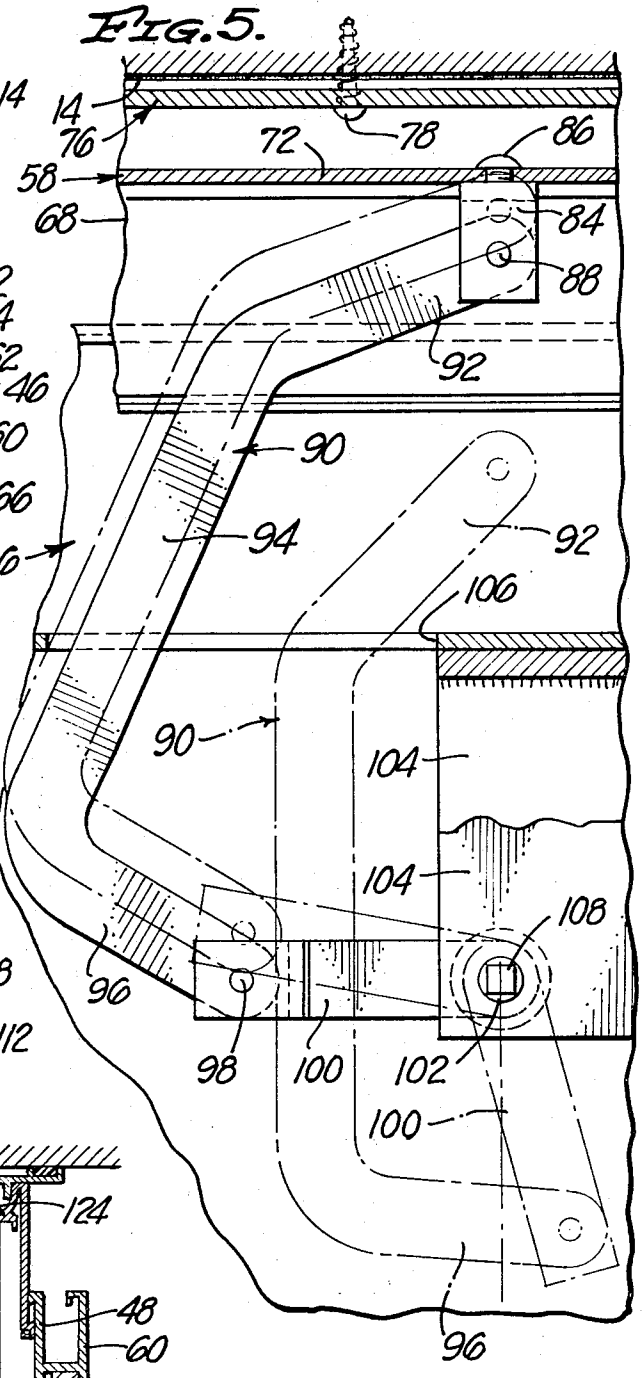


FIG. 6.

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DEMOUNTABLE WALL STRUCTURE

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Int. Cl. E04b 2/18, 2/78
U.S. Cl. 52—122 1 Claim

ABSTRACT OF THE DISCLOSURE

Demountable wall panels are disclosed which include centrally located panel sections, ceiling clamps mounted on the tops of these panels, spring means biasing these ceiling clamps away from the sections on which they are located, toggle means connecting the ceiling clamps on these sections and means for moving the toggle means so that the ceiling clamps are in either an extended position or retracted position in which they extend generally along the tops of the panel sections. These panels preferably also include inner engaging means located along their side edges and an adjustable bottom plate located along their bottoms.

BACKGROUND OF THE INVENTION

Traditionally the interior walls within buildings have been built into such buildings so as to form an integral part within them. While walls constructed integrally with a building are undoubtedly satisfactory for most purposes, they are nevertheless disadvantageous under some circumstances. To understand this it is necessary to consider the fact that the space utilization within a building may change periodically.

Thus, for example, office buildings, schools and the like are frequently constructed with rigid walls separating the interior of a building into different rooms for different, specific utilizations. In office buildings frequently the need will arise to change the sizes, shapes and locations of the offices. With schools frequently the need will arise to change the dimensions of the classrooms. When rigid structures are used as walls within such buildings, obviously it is a relatively difficult and normally a relatively expensive task to change or relocate such walls.

Because of this problem, a great variety of different so-called demountable wall structures have been proposed and to varying extents adopted. An understanding of this invention does not require detailed analysis of all such prior structures. Generally speaking such prior structures have suffered from any one of a series of limitations. Frequently they have been relatively expensive. On occasion they have been relatively complex and/or incapable of easy, convenient utilization. At times they have been designed so as to require some significant attachment or other connection to a building.

SUMMARY OF THE INVENTION

An object of this invention is to provide new and improved wall panels which overcome various limitations of prior related structures such as are briefly indicated in the preceding discussion. A further object of this invention is to provide wall panels which may be used with a minimum of difficulty in partitioning off an interior wall within a building. A closely-related objective is to provide wall panels which are not significantly attached o the interior of a building, and which can be easily moved from one location to another as may be required or desired during the continuing use of the building. Other objectives of this invention are to provide wall panels of the type indicated which may be relatively inexpensively constructed and which may be easily and conveniently set up and used within a building.

In accordance with this invention these objectives are achieved by providing demountable wall panels, each of which includes a centrally-located or wall section having top, bottom and side edges, a ceiling clamp movably mounted on the top of the panel section so as to be capable of being moved towards and away from this top, spring means connecting the ceiling clamp and the panel section and biasing the ceiling clamp away from the panel section, lever means constituting a part of the toggle system connecting the ceiling clamp with the panel section and means for moving the lever means so that the ceiling clamp in one position is held adjacent the top edge of the panel section and so that in another position the ceiling clamp is biased away from the panel section by the spring means employed.

DESCRIPTION OF THE DRAWINGS

No summary of this type is capable of completely and accurately indicating the nature of an invention such as the present invention. The actual details of this invention are best explained by referring to the accompanying drawings in which:

FIG. 1 is a view of a part of an interior of a building withing which there are located presently-preferred embodiments of demountable wall panels of this invention;

FIG. 2 is a partial cross-sectional view taken at line 2—2 of FIG. 1;

FIG. 3 is a partial cross-sectional view taken at line 3—3 of FIG. 1;

FIG. 4 is a partial cross-sectional view taken at line 4—4 of FIG. 1;

FIG. 5 is a partial cross-sectional view taken at line 5—5 of FIG. 4, portions of this view being broken away for convenience of illustration; and

FIG. 6 is a partial cross-sectional view taken at line 6—6 of FIG. 1.

From a careful consideration of the aforegoing objectives of this invention, of the drawings and of the remainder of this specification, it will be realized that numerous changes may be made in the demountable wall panels illustrated and described through the exercise of routine engineering skill without departing from the principles of this invention as defined by the appended claims. For this reason the illustration of a preferred embodiment of this invention and a description of it is not to be taken as limiting the invention in any respect.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In the drawing there is shown a section of a wall composed of demountable wall panels **10** of this invention. These wall panels **10** are mounted as hereinafter described between a floor **12** and ceiling **14** so as to lead to an existing side wall **16** within a building interior. One of the panels illustrated is provided with a door jamb **18** and a conventional door **20**. The construction of this jamb **18** and door **20** is immaterial as far as the present invention is concerned. If desired, this jamb **18** and the door **20** may be constructed in accordance with conventional practice.

Each of the panels **10** has a top edge **22**, a bottom edge **24** and side edges **26** and **28**. In the structure shown these side edges **26** and **28** are "framed" by edge channels **30** which are bilaterally symmetrical as shown in FIG. 2 of the drawing. Each of the channels **30** has a generally U-shaped center section **32** having outwardly projecting ends **34**. These ends **34** are provided with terminal flanges **36**. One of these ends **34** on each channel **30** is provided with an abutting flange **38**. The flanges **36** are designed so as to hold surface boards **40** forming a part of the panel **10** along the sides of the center section **32** parallel

to one another. These center sections **32** are preferably connected by means of bolts **42** so as to hold the channels **30** in each panel **10** rigidly with respect to the surface boards **40**.

With this construction when the panels **10** are moved together to form a wall as shown, the abutting flange **38** on one of the channels **30** on a panel **10** fits up against an end **34** on a channel **30** on the next adjacent panel **10** in back of a flange **36**. When the panels **10** are so positioned so as to fit against one another, the exteriors of the flanges **36** are exposed and are separated by a comparatively small slot. Such a slot may conveniently be utilized in conjunction with the abutting flanges **38** for such purposes as mounting bookshelves, a blackboard, a bulletin board or the like. The abutting flanges **38** are preferably formed of a specialized configuration as indicated for such mounting purposes. They may contain small weakened sections **44** of a so-called knock-out variety which are adapted to be punched out so that they can be used in holding conventional shelf-type fasteners.

The top edges **22** of the panels **10** are preferably provided with other differently-constructed mounting channels **46** shaped as indicated in FIG. 4 of the drawing. The channel **46** illustrated has a generally box-shaped holding subchannel **48** having a bottom **50**, parallel sides **52** and an open top **54**. Small, inwardly directed flanges **56** are located at the ends of the sides **52** for the purpose of limiting motion of a ceiling clamp **58**.

This channel **46** is also provided with edge subchannels **60** located along the sides of the subchannel **48**. These subchannels **60** are of the same general configuration as the subchannel **48**, but are of smaller dimension than the subchannel **48**. These subchannels **60** include open tops **62** and peripheral flanges **64**. These tops **62** and flanges **64** may be used in hanging pictures or the like. Although it is not normally considered necessary, they may also be used in mounting a decorative structure along the top edge **22**. These subchannels **60** carry bottom flanges **66** which fit over the surface boards **40** so as to hold the channel **46** in a panel **10** so it is supported by these boards.

The ceiling clamp **58** includes parallel sides **68** which are adapted to slide through the top **54** of the subchannel **48** against the surfaces of the flanges **56**. These sides **68** include at their extremities other flanges **70** which are adapted to fit against the flanges **56** so as to limit movement of the ceiling flange **58** with respect to channel **46** and, of course, the remainder of the entire wall panel **10**. In the ceiling clamp **58** the sides **68** are joined together by inwardly curved base **72** extending between the sides **68**.

This base **72** is adapted to fit along the sides of flange-like projections **74** on a mounting plate **76** attached to the ceiling **14**. Although it is considered preferable to utilize the mounting plate **76** with the wall panels **10**, effective usable structures can be created by forming the base **72** of a different configuration so that it will directly engage and hold against a ceiling **14**. The particular mounting plate **76** shown is adapted to be secured in place by a common screw **78**. It includes holding flanges **80** retaining small rubber or rubber-like strips **82** adapted to engage the ceiling **14** so as to prevent unnecessary marring of this ceiling.

A small yoke **84** is connected to the base **72** of the ceiling clamp **58** by means of an appropriate conventional fastener **86**. A pivot pin **88** on the yoke **84** pivotally carries an end **92** of an actuating lever **90**. This lever **90** has the end **92** located at an obtuse angle to a center section **94** and another end **96** located at a right angle to this center section. This other end **96** is pivotally connected by a pin **98** to an end of a crank arm **100** mounted upon a shaft **102**. This shaft **102** is rotatably carried by bearing arms **104** extending from the bottom **50** of the subchannel **48**. It will be noted that a small opening **106** is located in this bottom **50** for the purpose of accommodating the lever **90**. An end **108** of the shaft **102** is of a non-round shape so that this shaft **102** may be engaged with a conventional wrench so as to be turned. Access is provided to this end **108** by means of an opening **110** in one of the surface boards **40**. If desired this opening **110** may be surrounded by a protective grommet **112**.

This bottom **50** of the subchannel **48** also carries holding cylinders **114**. Preferably two of these cylinders **114** are used so that each is adjacent to one of the side edges **26** or **28** in a particular panel **10**. Each of the cylinders **114** carries an internal spring **116** so that such spring **116** tends to bias a piston **118** within it towards the bottom **50** of the subchannel **48**. Each piston **118** used carries a piston rod **120** extending through an opening **122** in this bottom **50**. The piston rods **120** are connected to the base **72** of the ceiling clamp **58** by means of conventional fasteners **124**.

From a consideration of the wall panel **10** it will be obvious that the springs **116** serve as a means for biasing the ceiling clamp **58** in a panel **10** away from the central region of such a panel. When the ceiling clamp **58** is in an extended position as illustrated by full lines in the drawings, the lever **90** is in a position as shown in FIG. 5. This lever **90** may, however, be turned by rotating the shaft **102** so that the crank arm **100** and the lever **90** assume a withdrawn position as indicated in phantom towards the bottom of FIG. 5. In this position further rotation of the shaft **102** and the lever **90** is prevented by mechanical engagement as between the lever **90** and the bottom **50** of the subchannel **48**.

In this position of the lever **90** the ceiling clamp **58** is withdrawn into the channel **50** generally along the top edge **22**. In this position upward movement of the ceiling clamp **58** is prevented by what is referred to herein as a toggle type action. It will be noted that the pin **98** as shown in phantom in FIG. 5 is to the right of a line drawn through the pin **88** and the shaft **102**. As a consequence of this, there is what may be referred to as an overcenter type action. Further rotation of the shaft **102** in a clockwise direction is prevented by means of the physical engagement described in the preceding. However, in this withdrawn position the springs **116** continue to tend to urge the ceiling clamp **58** in an upward direction. Because the pin **98** has been moved past a line drawn through pin **88** and the shaft **102** the ceiling clamp **58** is in this withdrawn position held by the springs **116** so that it cannot go any where until the shaft **102** is turned. This has the effect of locking the ceiling clamp **58** in a withdrawn position.

In such a withdrawn position a wall panel **10** may be easily moved from one location to another prior to being installed. This is considered quite advantageous in that it will normally provide ceiling clearance enabling such a panel **10** to be moved from one location to another with a minimum of difficulty. In a new location such a panel **10** is preferably located beneath a mounting plate **76**. When so located the panel **10** may be installed by rotating the shaft **102** so that the lever **90** and the crank arm **100** assume positions indicated by full lines in FIG. 5 of the drawing. In this position the springs **116** will bias the ceiling clamp **58** into engagement with the mounting plate **76** so as to firmly hold the panel **10** into an extended position.

Because of the fact that frequently floors such as the floor **12** in areas where the panel **10** are to be used are not overly level or parallel to a ceiling such as the ceiling **14**, it is preferred to provide a panel **10** with a floor adjustment structure **126** as indicated in FIG. 3 of the drawing. At times it will not be necessary to include a floor adjustment structure **126** such as is shown with a panel **10**. However, the precise structure **126** described or other related structures may be used with a panel **10** whenever it is necessary because of the intended application.

Such an adjustment structure **126** includes a channel **128** engaging and mounted upon the surface boards **40**. This channel **128** may include side flanges **130** serving an appearance function and guide flanges **132** extending parallel to the surface boards **40**. Similar flanges **134** on a

bottom plate **136** ride along the sides of these guide flanges **132** for the purposes of controlling the direction of movement of the plate **136**. This plate **136** may include flanges **138** engaging rubber or similar members **140** which are designed to engage a floor without marring it.

A conventional threaded fastener **142** may be rotatably supported in a bushing **144** held by the plate **136** so as to be capable of being turned with respect to the plate **136**. This fastener **142** carries a threaded nut **146** between the guide flanges **132**. The relative position between the plate **136** and the remainder of a wall panel **10** can be varied by turning this fastener **140** so that the position of the nut **146** is varied along the length of this fastener. In this structure **126** the channel **128** may be connected to the bottom **50** of the subchannel **48** through the use of other bolts **42** so as to secure the entire wall panel into an effective, usable structure.

With a wall panel **10** the surface boards **40** employed may be of any desired type. Further they may be provided with any desired surface coating which may be required for decorative or utilitarian purposes. When it is desired the sound transmission properties within a panel **10** may be regulated by filling the interiors of the panel **10** between the surface boards **40** with an appropriate insulating type material **148**. Such materials should be of such a character and/or secured in such manner that they will not interfere with the operation of the crank arm **100** or the lever **90** as the complete panel **10** is used. Since the panels **10** are normally held vertically, it is possible to use loose material such as material **148** since such loose material will normally fall and pack between the board **40** out of the area occupied by the crank arm **100** and the lever **90**.

What is claimed is:

1. A demountable wall panel structure which comprises:

a mounting plate adapted to be secured to a ceiling, a portion of said mounting plate extending therefrom towards a floor when said mounting plate is secured to a ceiling,

a panel section having a top, a bottom and side edges, said panel including two spaced surface boards,

said panel also including a top, a bottom, and two side channels located along said top, bottom and side edges, respectively,

said side channels each having a U-shaped center section between said surface boards, outwardly projecting ends on said center section and terminal flanges located on said projecting ends, said surface fitting between said center section and said terminal flanges so as to be held therebetween,

means extending between said center sections of said side channels for holding said side channels with respect to said surface channels,

said top channel having a subchannel which has a bottom, parallel sides and an open top, said top channel having outwardly extending structures located on said parallel sides and bottom flanges located on said outwardly extending structures, said surface boards fitting between said parallel sides and said bottom flanges so as to hold said top channel so it is supported by said surface boards,

a ceiling clamp having parallel sides and a base extending between said parallel sides and joining said parallel sides, said clamp being located between the sides of said subchannel so as to extend out of said open top with said base being located above said top channel, said ceiling clamp being movable with respect to said top channel so as to be capable of being moved away from said top channel into engagement with said mounting plate, said base of said ceiling clamp being shaped so as to engage said portion of said mounting plate when moved away from said top channel into engagement with said mounting plate.

spring means for biasing said ceiling clamp away from said top channel located between said surface boards and being mounted on said subchannel of said top channel and being connected to said ceiling clamp,

toggle means mounted on said top channel between said surface boards and connected to said ceiling clamp, said toggle means having a first position in which said clamp is held adjacent to the remainder of said panel section against the pressure of said spring means and a second position in which said ceiling clamp is biased away from said top channel in engagement with said mounting plate by said spring means, said toggle means including a rotatable shaft for moving said toggle means from either of said positions to the other of said positions,

coacting means for limiting the movement of said ceiling clamp away from said top channel located on said top channel and said ceiling clamp so as to be capable of engaging one another when said toggle means is in said second position,

interfitting means at the side edges of said panel section for engaging corresponding interfitting means on an adjacent demountable wall panel structure so as to form a wall in which such panel structures are located so as to fit against one another,

floor adjustment means for conforming to a floor surface located on said bottom channel, said floor adjustment means being capable of being moved with respect to said bottom channel so as to extend therefrom.

References Cited

UNITED STATES PATENTS

3,120,031	2/1964	Bohnsack	52—241
1,876,528	9/1932	Walters	52—238
3,292,321	12/1966	Schans	52—241X
3,341,992	9/1967	Piper	52—127
3,400,504	9/1968	Neisewander	52—127X

FOREIGN PATENTS

1,281,875	1961	France	52—238

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U.S. Cl. X.R.

52—241

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(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,566,559 Dated March 2, 1971

Inventor(s) Wesley B. Dickson

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 5, line 48, (Claim 1, line 15), the word "

--boards-- should appear after the word "surface".

Signed and sealed this 15th day of June 1971.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

WILLIAM E. SCHUYLER,
Commissioner of Pate