Nov. 17, 1953 R. P. CARROLL 2,659,110

AIR WALL BUILDING STRUCTURE

Filed April 25, 1951 3 Sheets-Sheet 1

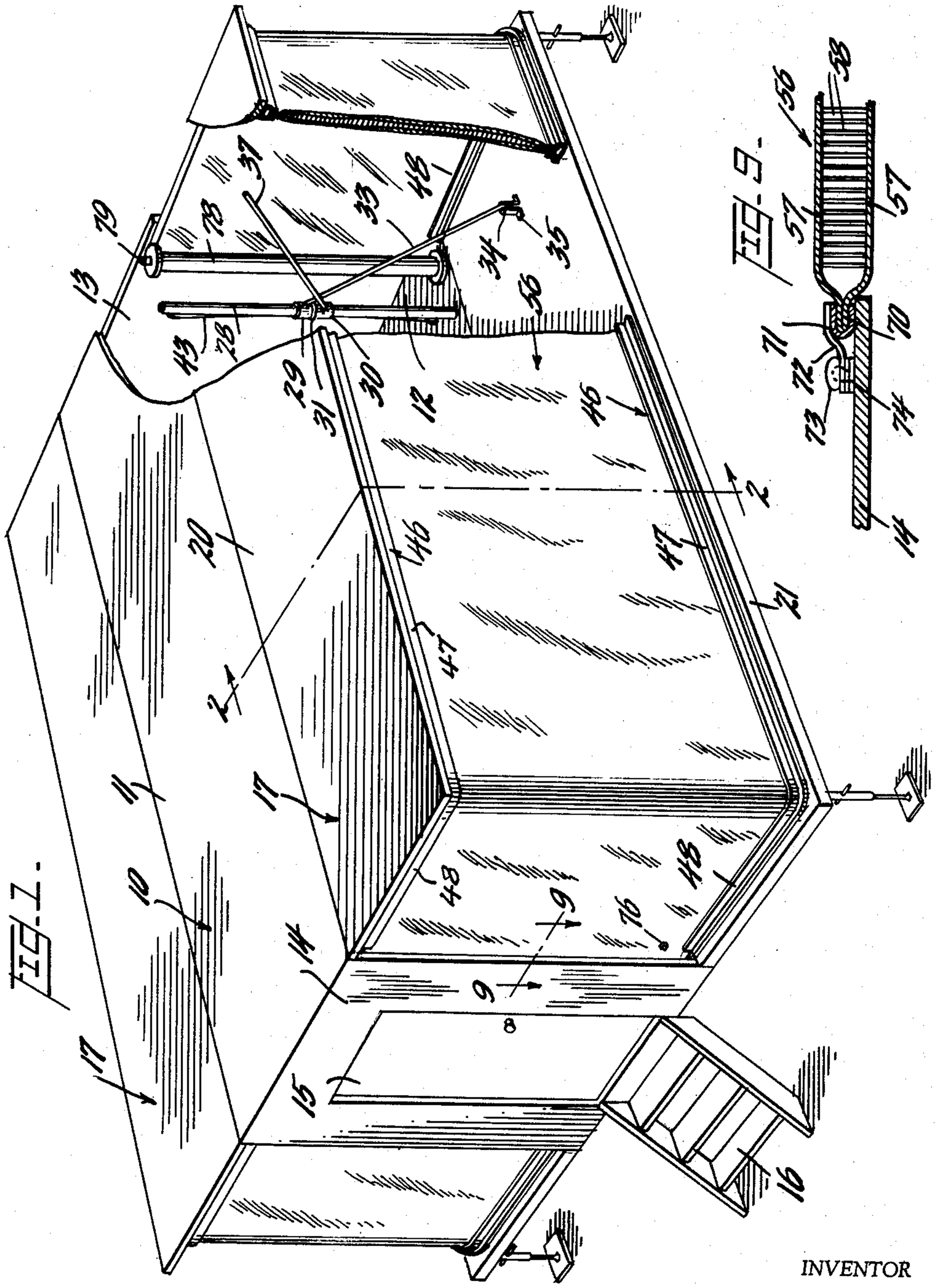

FIG. 1.

FIG. 9.

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AIR WALL BUILDING STRUCTURE

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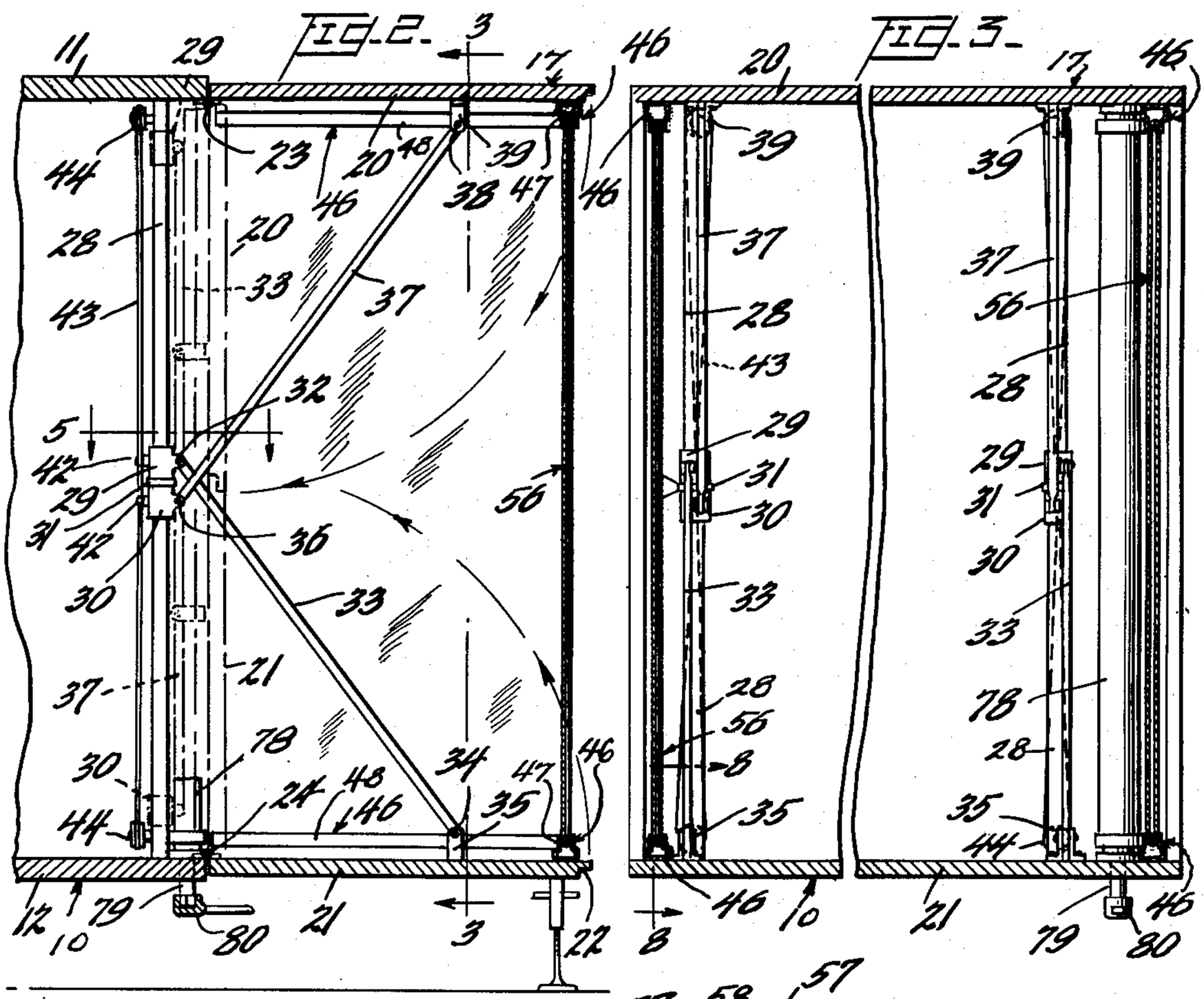

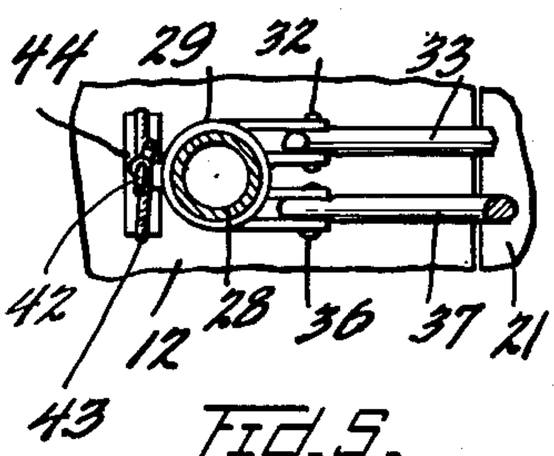

FIG-5-

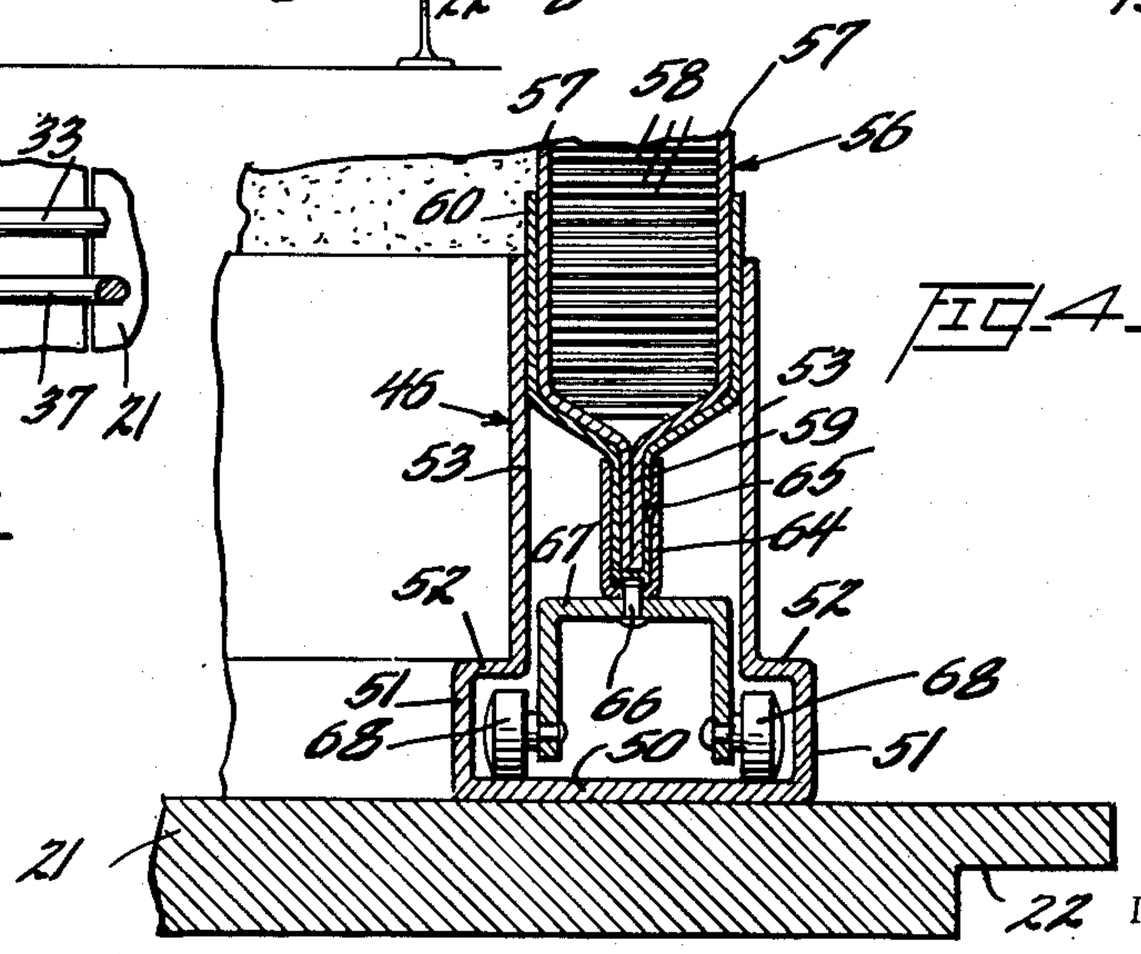

FIG-4-

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AIR WALL BUILDING STRUCTURE

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FIG. 6.

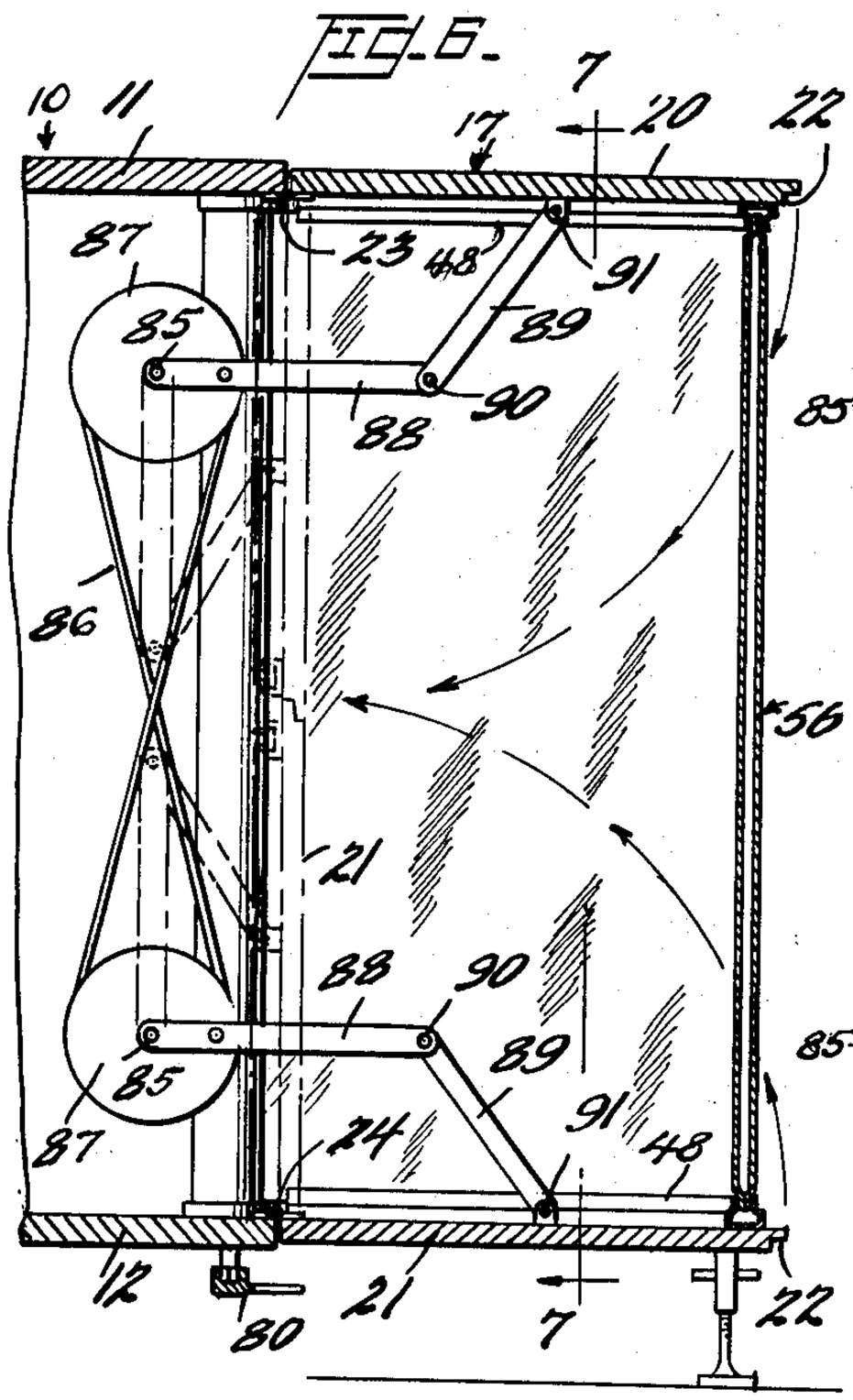


FIG. 7.

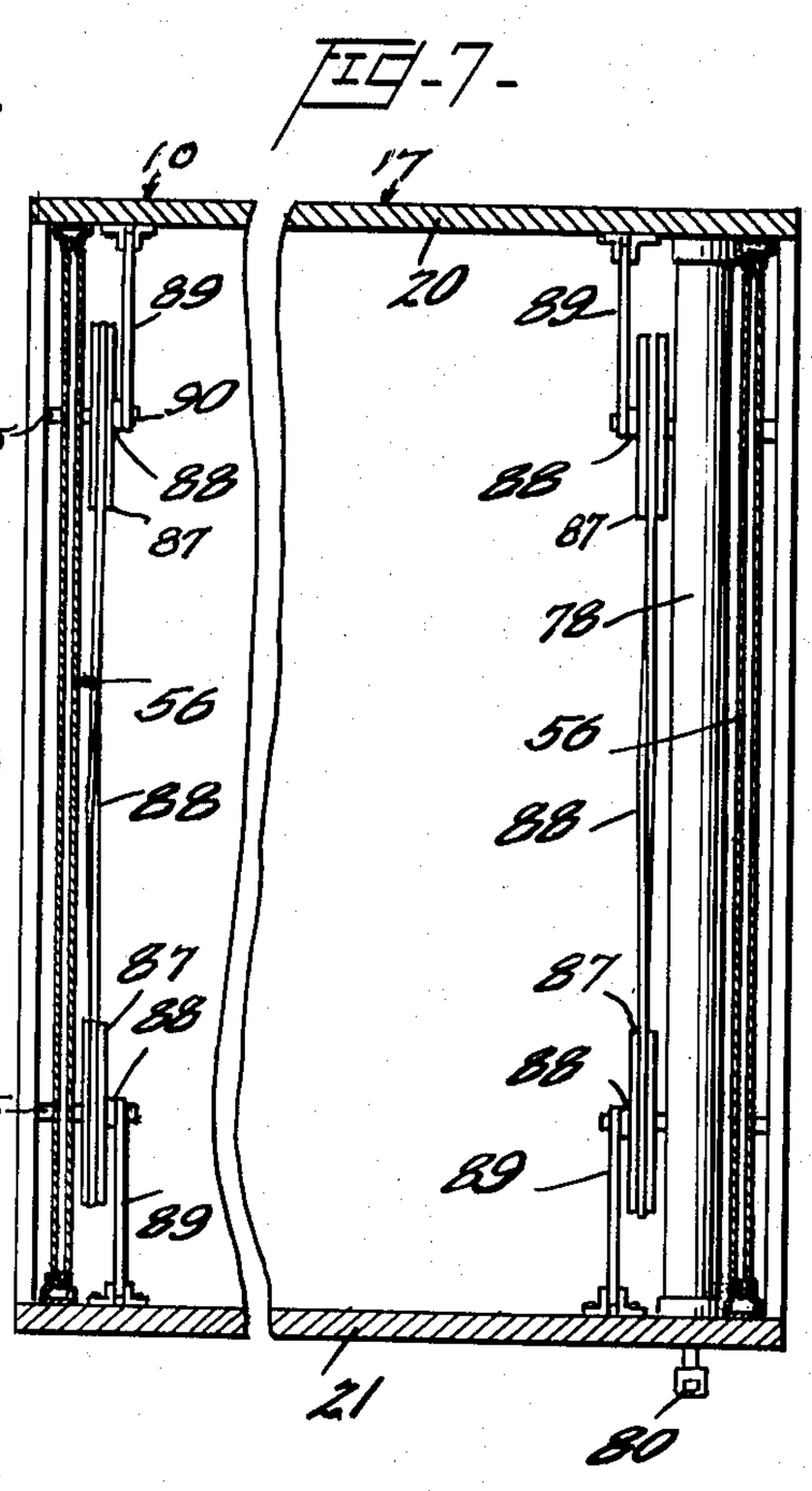
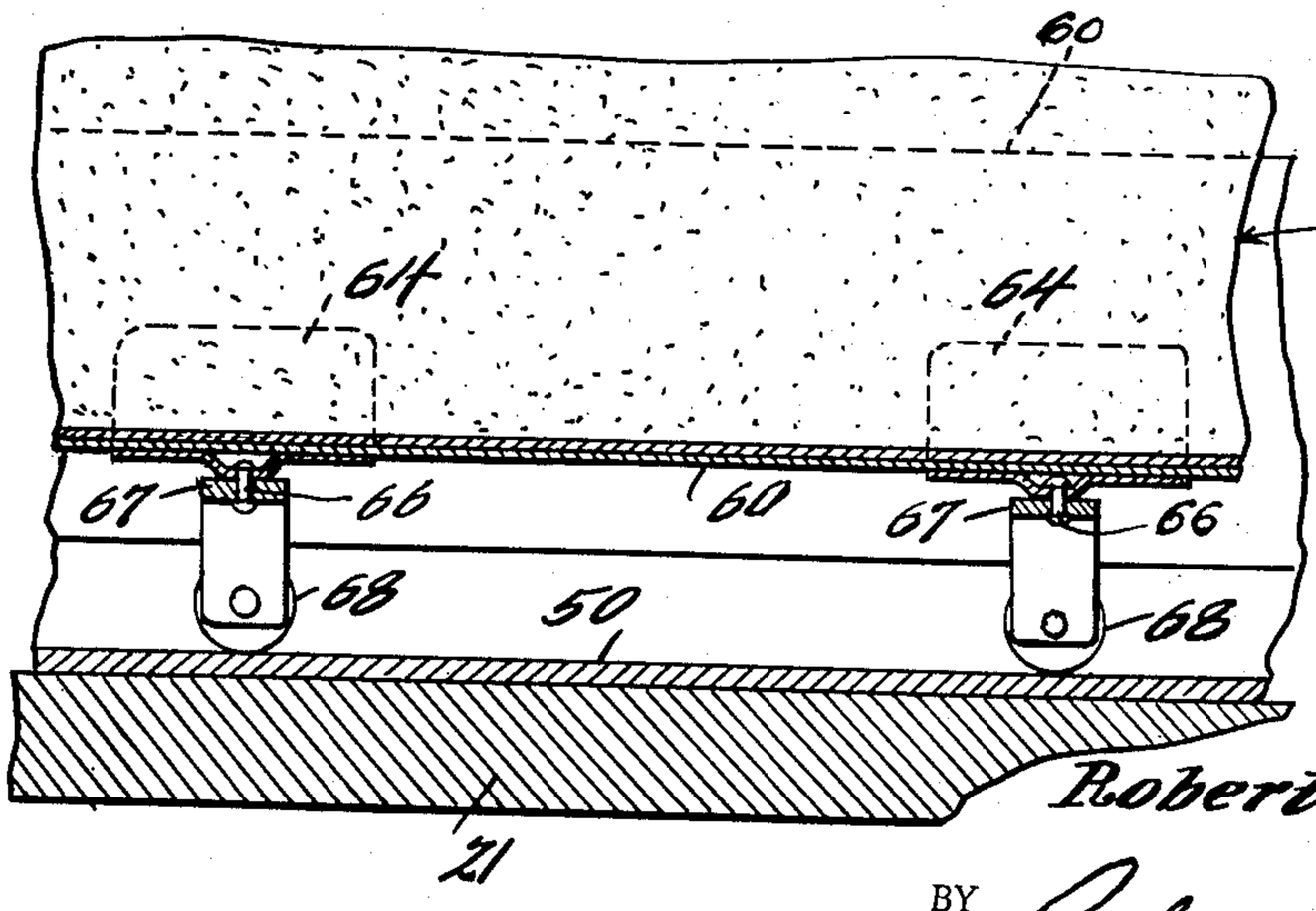


FIG. 8.



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2,659,110

UNITED STATES PATENT OFFICE

2,659,110

AIR WALL BUILDING STRUCTURE

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Application April 25, 1951, Serial No. 222,905

22 Claims. (Cl. 20—2)

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This invention relates to a relatively rigid air wall building structure, and more particularly to an extensible structure having a relatively rigid inflated wall for use in extending building structures, trailer bodies and the like.

An important object of the invention is to provide a novel structure by means of which a building such as a shop, trailer body, etc., may be extended in size to provide additional space within the structure.

More specifically, an object of the invention is to provide a building structure wherein one wall of the structure may be opened and wherein the structure is provided with means for supporting in position an inflatable wall structure whereby the interior of the building structure may be enlarged for any useful purpose.

A further object is to provide such a building structure wherein the wall adapted to be opened is in the form of movable sections, one of which forms the ceiling or roof and the other the floor for the extensible structure, the wall of such extensible structure being in the form of a normally deflated flexible wall adapted to be moved outwardly and supported relative to the edge portions of said ceiling and roof and then inflated to become a relatively rigid wall of the extended building structure.

A further object is to provide a normally flexible inflatable wall of the type referred to and to provide in cooperation therewith means for guiding such wall to an operative position and to engage and fix the wall in position when it is inflated.

A further object is to provide such a guiding and position-fixing means for an inflatable wall which cooperates with the wall, when inflated, to provide sealed waterproof joints between the wall and the ceiling and floor structures.

A further object is to provide means for facilitating the moving of the movable building wall elements to positions forming the floor and roof of the extended building structure and for supporting such floor and roof elements in position.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the drawings, I have shown two embodiments of the invention. In this showing,

Figure 1 is a perspective view of a building structure showing the invention applied, parts being broken away for the purpose of illustration,

Figure 2 is a sectional view taken generally in the plane indicated by the line 2—2 in Figure 1,

Figure 3 is a sectional view on line 3—3 of Figure 2,

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Figure 4 is an enlarged fragmentary sectional view showing a portion of one of the guide tracks and associated elements connected to the floor portion of the extensible building wall and illustrating a portion of the inflatable wall,

Figure 5 is a detailed sectional view on line 5—5 of Figure 2,

Figure 6 is a sectional view similar to Figure 2 showing a modified form of construction,

Figure 7 is a sectional view on line 7—7 of Figure 6,

Figure 8 is an enlarged fragmentary sectional view on line 8—8 of Figure 3, or along a corresponding line in Figure 7, and

Figure 9 is an enlarged fragmentary sectional view on line 9—9 of Figure 1.

Referring to Figure 1, the numeral 10 designates a building structure as a whole which may be supported in any suitable manner (not shown). The structure 10 may be any conventional building structure supported on piers or a foundation, or it may be a vehicle trailer body or the like. The structure is shown as having a roof 11, floor 12, rear wall 13 and forward wall 14, the latter of which is provided with a door 15 shown as being accessible by steps 16. The structure 10 is provided with side walls each indicated as a whole by the numeral 17. Either or both of these side walls may be made extensible in accordance with the present invention, and both have been so illustrated in Figure 1.

Each side wall is formed of upper and lower sections 20 and 21 grooved as at 22 (Figures 4 and 6) to provide an overlapping joint when the sections 20 and 21 are in closed position as indicated by the broken lines in Figure 6. The wall sections 20 and 21 are respectively hinged as at 23 and 24 to the roof 11 and floor 12, and when the building structure is extended as shown in Figures 1 and 6, the wall sections 20 and 21 form the ceiling or roof and floor of the extended building section as further described below.

Means may be provided for mechanically moving the wall sections 20 and 21 to their extended positions. One means for accomplishing this is shown in Figures 2 and 3, and a modified form of means is shown in Figures 6 and 7. Referring to Figures 1, 2 and 3, the numeral 28 designates a pair of posts, one arranged adjacent each of the building walls 13 and 14 adjacent one of the side walls. This post is fixed at its ends to the roof 11 and floor 12. A pair of collars 29 and 30 is mounted to slide on each post 28 and a fixed stop member 31 surrounds the post 28 intermediate the ends thereof to act as a stop member for each of the collars when

the latter are in their operative positions shown in Figure 2. Each collar 29 has pivoted thereto as at 32 (Figure 5) a reach rod 33, the other end of which is pivotally connected as at 34 to a bracket 35 fixed to the floor section 21. Each collar 30 has pivotally connected thereto as at 36 one end of a reach rod 37, the other end of which is pivotally connected as at 38 to a bracket 39 fixed to the roof section 20. When the sections 20 and 21 are moved to the broken line position in Figure 2 to form a side wall of the building structure, the collars 29 and 30 are also in the broken line positions in Figure 2. When the wall sections 20 and 21 are swung outwardly to form roof and floor sections of the building extension, the collars 29 and 30 contact the stop member 31 to limit movement of the sections 20 and 21 away from each other.

Each collar 29 and 30 has connected thereto as at 42 (Figures 2 and 5) one end of a cable 43 which passes around upper and lower pulleys 44 fixed to each post 28. As shown in dotted lines in Figure 3, the cable 43 is crossed over to reverse the movement of the collars 29 and 30 upon movement of the cable 43. Thus when the collar 29 is moved upwardly, the collar 30 moves downwardly and vice versa. By pulling on the cables 43 associated with the posts 28 adjacent one side wall of the building structure, the wall sections 20 and 21 may be moved inwardly or outwardly. Each wall section 20 and 21 is provided with a continuous track indicated as a whole by the numeral 46 and extending throughout the width and length of each such section. In other words, each track 46 comprises a portion 47 extending from end to end of the longitudinal edge of each section 20 and 21 and sections 48 extending throughout the length of the forward and rear edges of such wall sections.

Each track unit is formed in section as shown in detail in Figure 4 and comprises a bottom wall 50. This showing, of course, is the arrangement of the track relative to the wall section 21 and the wall 50 will be the top wall of the track 46 of the upper wall section 20. The track, however, will be described with relation to its showing in Figure 4 and it will be understood that this description applies to the track 46 of the wall section 20 except that the track will be inverted. Each track turns upwardly at the extremities of the bottom wall 50 as at 51, then inwardly as at 52 and then upwardly as at 53. The elements 50, 51 and 52 constitute the track proper for rollers, one pair of which is shown in Figure 4, and these rollers will be described in detail later. The material from which the track sections 46 are made is relatively stiff, and it will be apparent that the side wall portions 53, which extend upwardly a substantial distance from the inwardly extending wall portions 52, will be relatively stiff but afford some slight degree of resiliency. Actually, as will become apparent, the side wall portions 53 may be fully rigid.

The inflatable wall portion of the structure is indicated as a whole by the numeral 56. This wall structure comprises opposite flexible wall elements 57, each of which is formed of a relatively heavy fabric, provided with a rubber or other waterproof and impervious coating and the fabric layers of the wall sections 57 are connected by cords 58 closely arranged relative to each other throughout the areas of the fabric layers. These cords are woven into the fabric layers, and while they do not possess great tensile strength individually, the multitude of closely arranged cords provides a high degree of tensile strength in the cords to limit movement of the wall sections 57 away from each other.

In accordance with the present invention, the top and bottom edges of the wall sections 57 are brought together as at 59 and a reinforcing flexible covering 60 is cemented over the adjacent outer surfaces of the wall sections 57 and extends beyond the free edges of the track walls 53.

At spaced points along the seam provided by the members 59 and 60 are arranged U-shaped clips 64 formed of metal having punched-in lips 65 to clinch them relative to the sealing beads of the flexible wall. Each clip 64 is connected by a pivot pin 66, in the form of a rivet, to a roller carrier 67 preferably of inverted U-shape as shown in Figure 4, and each end of this carrier is provided with rollers 68 adapted to travel in the grooves formed by the adjacent wall portions 50, 51 and 52. All of the structure just described in connection with Figure 4 is duplicated, of course, at the top of the wall 56 and forms the means for connecting such wall to the wall section 20.

A horizontal sectional view of one end of the inflatable wall 56 is shown in Figure 9, each vertical end of the wall 56 has its edges brought together as at 70 and covered by a cealing strip 71 cemented therearound as shown in Figure 9. The forward end of the wall 56, which is the end shown in Figure 9, is provided at spaced points with straps 72 carrying snap fastener sockets 73 adapted for connection with conventional stud members 74. It will become apparent that any suitable type of means, in place of the snap fasteners, may be employed for securing the forward edge of the inflatable wall 56 to the front wall 14 of the building structure. The rear edge of the inflatable wall is sealed in the same manner as the forward edge shown in Figure 9 and is adapted to be wound upon a reel to be described. All four edges of the wall 56 accordingly are sealed, and the wall 56 is inflatable. This is accomplished by connecting a hose from a suitable source of pressure to a valve 76 (Figure 1) which may be located at any desired or convenient point internally or externally of the wall 56.

The rear extremity of the wall 56 is adapted to be wound upon a reel 78 (Figure 1). This reel may be provided at its ends with stub shafts 79 journaled respectively in the roof 11 and floor 12 of the building structure. Any suitable means may be employed for winding the wall 56 on the reel 78, and merely for the purpose of illustration, the lower stub shaft 79 (Figure 2) has been shown as being provided with a polygonal end engageable by a socket wrench 80 or similar implement.

In Figures 6 and 7 of the drawings, I have shown a somewhat modified type of means for moving the wall sections 20 and 21 between open and closed positions. The parts in Figures 6 and 7 which correspond to parts already described have been indicated by the same reference numerals. It will become apparent that the means for moving the walls 20 and 21 in both forms of the invention operate as counterbalancing means, any gravitational force tending to move one of these wall sections downwardly transmitting mechanical forces tending to move the other wall section upwardly.

Referring to Figures 6 and 7, the numeral 85 indicates each of a pair of shafts associated with each wall 13 and 14. Each of these shafts sup-

ports a pulley 87 and a cable 86 passes around the pulleys 87 and is crossed as shown in Figure 7 to reverse the rotation of the pulleys. Each pulley has fixed thereto an arm 88 to one end of which is pivotally connected a link 89 as at 90. The other ends of the links 89 are pivotally connected as at 91 respectively to the wall sections 20 and 21. It will be apparent that by pulling on the cable 86, the pulleys 87 will be reversely rotated to effect opening or closing movement of the wall sections 20 and 21. These sections, when closed, occupy the broken line positions in Figure 6, and under such conditions, the arms 88 and links 89 are arranged in the broken line positions shown in the same figure, in alignment with the axes of the shafts 85.

Operation

The operation of the form of the invention shown in Figures 1 to 5, 8 and 9 is as follows. The structure 10 may be a shed or other building, a vehicle trailer body, etc. The present invention is highly useful in enlarging the available space in the structure 10 for any useful purposes. For example, this structure may be a shop trailer containing tools and machines movable to the sites of repair jobs, etc., and the width of the trailer body would be limited by State laws.

The present invention provides means whereby the available space may be substantially tripled. Normally, the wall sections 20 and 21 are closed as shown in broken lines in Figure 2. When it is desired to expand the space within the structure 10 at one side thereof, operators will pull on the cables 43 to move the collars 29 and 30 toward each other, thus transmitting forces through the links 37 and 33 to swing outwardly the wall sections 20 and 21. The crossing of the cable 43 between the pulleys 44 reverses the rotation of these pulleys, and accordingly reverses the direction of movement of the collars 29 and 30 transmitted thereto by the cable through its connections 42. The collars 29 and 30 are mechanically connected to each other by the cable, and any gravitational force tending to move the roof section 20 downwardly will tend to move the floor section 21 upwardly. The sections 20 and 21, being approximately the same size and weight, will counterbalance each other and they will remain in their horizontal positions when moved to such positions.

The wall 56, under the conditions now being considered, will be completely deflated and will be wound upon the reel 78. The rear portions 48 of the upper and lower track structures 46 will terminate adjacent the reel 78, and the first wheel carrier 67 arranged adjacent such track sections at the top and bottom of the wall 46 will be inserted in these track sections. In any suitable manner, the operator will then move the inflatable wall 56 to its operative position shown in Figure 1. This may be done, for example, merely by grasping one or more of the straps 72 and pulling on the wall 56 to unwind it from the reel 78. Successive wheel carries 67 may be fed into the upper and lower track structures 47. Thus the wall 56 may be fed across the rear of the extended building structure, then forwardly along the side thereof, and thence inwardly across the front of the extended structure. The snap fasteners 73 are then connected to the studs 74, or the front edge of the inflatable wall 56 is connected to the wall 14 in any other desired manner.

It will be apparent that during the foregoing operation, the wall 56 will be relatively soft and

limp, and this is necessary for the free movement of the wall 56 to its operative position. However, it is not necessary at this time for the wall 56 to function as a connecting support between the wall sections 20 and 21. As a matter of fact, these wall sections are self-sustaining in the absence of loads because of the counterbalancing action referred to. Of course, when the floor section 21 is used and subjected to weight, the counterbalancing action no longer will be effective and accordingly, it is preferred that some supporting means be employed beneath the outer edge portions of the floor section 21. Such supports may be in the form of blocks or the like, but it is preferred that conventional jacks be employed as shown in Figures 1 and 2.

After the wall 56 has been extended to operative position, a pump hose is applied to the valve 76 to inflate the wall 56. This wall, when inflated, will possess a remarkable degree of rigidity. It is necessary only to inflate the wall 56 ordinarily to eight or ten pounds pressure per square inch. However, this is not critical, and higher pressures may be employed. The multiplicity of closely arranged connecting threads or cords 58 holds opposite wall layers 57 fixedly in parallel relation. Each cord 58, of course, possesses a relatively low degree of tensile strength, as stated, but the actual tensile strength resisting movement of the wall layers 57 is very high because of the use of such a great number of the closely arranged cords 58.

Referring to Figure 4, attention is invited to the fact that the parallel walls 53, which are relatively stiff, are normally arranged a distance apart slightly less than the width of the wall 56 across the sealing layer 60. The same is true of the cooperative relation between the parts associated with the roof section 20. When the wall 56 is fully inflated, therefore, the sides of the sealing members 60 will tightly engage the parallel walls 53 in sealing association therewith. Thus the interior of the structure is effectively sealed against the entrance of air and water. The sealing of the structure against the entrance of air is important in cold weather, and it is possible to keep the interior of the structure comfortably warm because of the insulating characteristics of the body of air within the wall 56.

It will be obvious that both sides of the structure may be extended as shown in Figure 1, thus substantially tripling the space within the structure. The floor sections 21, of course, form continuations of the floor 12 and accordingly facilitate the use of the expanded space within the structure. As stated, both sides of the structure may be made extensible, and one or both sides may be extended at any particular time, as may be desired.

When it is desired to restore the structure to its normal condition, the valve 76 will be opened to vent the interior of the wall 56 to the atmosphere. The wrench 80 or any other suitable means used for turning the reel 78 then may be operated to wind the wall 56 on the reel. The opening of the valve 76 permits the collapsing of the cords 58 as the winding operation proceeds, the opposite wall layers 57 thus moving substantially flat against each other to be wound on the reel. The cable 43 then may be operated to swing the wall sections 20 and 21 back to their normal positions shown in broken lines in Figure 2. The same operation, of course, will be performed at the opposite side of the structure if the latter has been extended at both sides. The

wall sections 20 and 21 may be locked in closed position by any suitable means (not shown) forming no part of the present invention. It also will be apparent that suitable means of any desired type may be employed for providing a leak-proof joint between the wall or roof section 20 and the roof 11 when the structure is opened, as shown in Figure 2.

The wheeled devices for supporting the wall 56 for movement, one of which devices is shown in Figure 4, are preferably employed for facilitating movement of the wall 56 between operative and normal positions. The bottom of the wall may slide on the floor section 21 if desired, but the anti-friction means shown greatly facilitates the operation. After the structure has been restored to normal position, of course, the wrench 80 and the supporting jacks will be removed.

The operation of the form of the device shown in Figures 6 and 7 is very similar to the operation of the structure shown in Figures 2 and 3. The pulling of the cable 86 will reversely rotate the pulleys 87, thus reversely swinging the arms 88 to simultaneously open or close the wall sections 20 and 21, depending upon the directions of rotational movement of the pulleys 87.

The present construction provides relatively simple and quickly and easily operable means for increasing the capacity of any structure such as a small shed or building, or a vehicle trailer. While it might appear that the normally highly flexible nature of the inflatable wall would not result in the provision of an operative wall possessing a practicable degree of rigidity, this clearly is not the case. The rigidity of the inflatable wall is substantially beyond what normally would be expected. Any blows which might be struck against this wall to tend to move the upper and lower ends thereof downwardly and upwardly respectively would be absorbed by the arrangement of the wheels 68 in their tracks and by the tight frictional engagement of the ceiling layers 60 with the parallel walls 50. This frictional engagement, as stated, is sufficiently tight to exclude water and air and is provided only when the wall is inflated. When the wall is deflated, it is freely movable along the several trackways.

I claim:

1. A building structure comprising upper and lower spaced supports forming parallel guideways, and an inflatable wall having opposite impervious surface layers and flexible connecting elements therebetween to limit movement of said layers away from each other, the edges of said layers being sealed, the upper and lower edges of said wall being movable along said guideways, and a valve for the introduction of fluid pressure into said wall.

2. A building structure comprising upper and lower spaced supports forming parallel guideways, and an inflatable wall having opposite impervious surface layers and flexible connecting elements therebetween to limit movement of said layers away from each other, the edges of said layers being sealed, said guideways having parallel flanges between which the upper and lower edges of said wall are movable to be guided by said guideways, and a valve carried by said wall for the introduction of fluid pressure thereinto.

3. A building structure comprising upper and lower spaced supports forming parallel guideways, and an inflatable wall having opposite impervious surface layers and flexible connecting elements therebetween, the edges of said layers being sealed, said guideways having parallel flanges between which the upper and lower edges of said wall are movable to be guided by said guideways, and a valve carried by said wall for the introduction of fluid pressure thereinto, said connecting elements limiting movement of the layers of said wall away from each other to a predetermined distance apart at least as great as the distance between said flanges whereby, when said wall is inflated, said layers frictionally engage said flanges.

4. A building structure comprising upper and lower spaced supports forming parallel guideways, and an inflatable wall having opposite impervious surface layers and flexible connecting elements therebetween to limit movement of said layers away from each other, the edges of said layers being sealed, said guideways having parallel flanges between which the upper and lower edges of said wall are movable to be guided by said guideways, a valve carried by said wall for the introduction of fluid pressure thereinto, said guideways having tracks, and anti-friction devices connected to the upper and lower edges of said wall and having wheels running in said tracks.

5. A building structure comprising upper and lower spaced supports forming parallel guideways, and an inflatable wall having opposite impervious surface layers and flexible connecting elements therebetween, the edges of said layers being sealed, said guideways having parallel flanges between which the upper and lower edges of said wall are movable to be guided by said guideways, a valve carried by said wall for the introduction of fluid pressure thereinto, said connecting elements limiting movement of the layers of said wall away from each other to a predetermined distance apart at least as great as the distance between said flanges whereby, when said wall is inflated, said layers frictionally engage said flanges, said guideways having tracks, and anti-friction devices connected to the upper and lower edges of said wall and having wheels running in said tracks, said wheels, when said wall is deflated, being freely movable along said tracks, the frictional engagement between said wall and said flanges when said wall is inflated preventing movement of said wheels along said tracks.

6. A building structure comprising upper and lower spaced supports forming parallel guideways, and an inflatable wall having opposite impervious surface layers and flexible connecting elements therebetween to limit movement of said layers away from each other, the edges of said layers being sealed, the upper and lower edges of said wall being movable along said guideways, a valve for the introduction of fluid pressure into said wall, and a reel arranged adjacent one end of said guideways and upon which said wall, when deflated, is adapted to be wound.

7. A building structure comprising upper and lower spaced supports forming parallel guideways, and an inflatable wall having opposite impervious surface layers and flexible connecting elements therebetween to limit movement of said layers away from each other, the edges of said layers being sealed, said guideways having parallel flanges between which the upper and lower edges of said wall are movable to be guided by said guideways, a valve carried by said wall for the introduction of fluid pressure thereinto, said guideways having tracks, anti-friction devices connected to the upper and lower edges of said

wall and having wheels running in said tracks, and a reel arranged adjacent one end of said guideways and upon which said wall, when deflated, is adapted to be wound.

8. A building structure comprising spaced roof and floor sections, a guideway carried by each of said sections, the guideway carried by said roof section opening downwardly and the guideway carried by said floor section opening upwardly, said guideways being in vertical alignment and forming channels, a wall having upper and lower edges movable in said guideways longitudinally thereof, said wall comprising impervious flexible surface layers, and closely spaced flexible elements connected therebetween to limit movement of said surface layers away from each other to a predetermined uniform extent, the edges of said layers being sealed to provide a leak-proof space therebetween, and a valve carried by one of said layers for the introduction of fluid pressure into said wall.

9. A building structure comprising spaced roof and floor sections, a guideway carried by each of said sections, the guideway carried by said roof section opening downwardly and the guideway carried by said floor section opening upwardly, said guideways being in vertical alignment and forming channels, a wall having upper and lower edges movable in said guideways longitudinally thereof, said wall comprising impervious flexible surface layers, and closely spaced flexible elements connected therebetween to limit movement of said surface layers away from each other to a predetermined uniform extent, the edges of said layers being sealed to provide a leak-proof space therebetween, and a valve carried by one of said layers for the introduction of fluid pressure into said wall, said guideways having flanges between which the upper and lower edge portions of said wall are movable, said flanges being spaced apart a distance slightly less than the distance between the outer faces of said surface layers when the latter are moved apart said predetermined distance whereby said flanges frictionally engage said surface layers when said wall is inflated.

10. A building structure comprising spaced roof and floor sections, a guideway carried by each of said sections, the guideway carried by said roof section opening downwardly and the guideway carried by said floor section opening upwardly, said guideways being in vertical alignment and forming channels, a wall having upper and lower edges movable in said guideways longitudinally thereof, said wall comprising impervious flexible surface layers, and closely spaced flexible elements connected therebetween to limit movement of said surface layers away from each other to a predetermined uniform extent, the edges of said layers being sealed to provide a leak-proof space therebetween, a valve carried by one of said layers for the introduction of fluid pressure into said wall, said guideways having portions thereof formed as tracks, and a plurality of anti-friction devices carried by each of the upper and lower edges of said wall in spaced relation and each having a wheel movable in the associated track.

11. A building structure comprising spaced roof and floor sections, a guideway carried by each of said sections, the guideway carried by said roof section opening downwardly and the guideway carried by said floor section opening upwardly, said guideways being in vertical alignment and forming channels, a wall having

upper and lower edges movable in said guideways longitudinally thereof, said wall comprising impervious flexible surface layers, and closely spaced flexible elements connected therebetween to limit movement of said surface layers away from each other to a predetermined uniform extent, the edges of said layers being sealed to provide a leak-proof space therebetween, a valve carried by one of said layers for the introduction of fluid pressure into said wall, said guideways having flanges between which the upper and lower edge portions of said wall are movable, said flanges being spaced apart a distance slightly less than the distance between the outer faces of said surface layers when the latter are moved apart said predetermined distance whereby said flanges frictionally engage said surface layers when said wall is inflated, said guideways having portions thereof formed as tracks, and a plurality of anti-friction devices carried by each of the upper and lower edges of said wall in spaced relation and each having a wheel movable in the associated track, said wheels being freely movable in said tracks when said wall is deflated, the frictional engagement of said flanges with said surface layers, when said wall is inflated, preventing movement of said wheels.

12. A building structure comprising spaced roof and floor sections, a guideway carried by each of said sections, the guideway carried by said roof section opening downwardly and the guideway carried by said floor section opening upwardly, said guideways being in vertical alignment and forming channels, a wall having upper and lower edges movable in said guideways longitudinally thereof, said wall comprising impervious flexible surface layers, and closely spaced flexible elements connected therebetween to limit movement of said surface layers away from each other to a predetermined uniform extent, the edges of said layers being sealed to provide a leak-proof space therebetween, a valve carried by one of said layers for the introduction of fluid pressure into said wall, and a vertical reel extending between said guideways adjacent one end thereof and connected to the adjacent end of said wall whereby rotation of said reel winds said wall thereon when said wall is deflated.

13. A building structure comprising spaced roof and floor sections, a guideway carried by each of said sections, the guideway carried by said roof section opening downwardly and the guideway carried by said floor section opening upwardly, said guideways being in vertical alignment and forming channels, a wall having upper and lower edges movable in said guideways longitudinally thereof, said wall comprising impervious flexible surface layers, and closely spaced flexible elements connected therebetween to limit movement of said surface layers away from each other to a predetermined uniform extent, the edges of said layers being sealed to provide a leak-proof space therebetween, a valve carried by one of said layers for the introduction of fluid pressure into said wall, said guideways having portions thereof formed as tracks, a plurality of anti-friction devices carried by each of the upper and lower edges of said wall in spaced relation and each having a wheel movable in the associated track, and a vertical reel extending between said guideways adjacent one end thereof and connected to the adjacent end

of said wall whereby rotation of said reel winds said wall thereon when said wall is deflated.

14. A building structure comprising a roof section and a floor section having end edges and connecting edges therebetween, a guideway fixed to the bottom of said roof section adjacent said edges thereof and a guideway fixed to the upper surface of said floor section adjacent said edges thereof, said guideways being substantially in vertical registration and being of channel form opening toward each other, and an inflatable wall having its upper and lower edges arranged in the respective guideways, said wall having flexible impervious surface layers and closely arranged flexible connecting elements extending therebetween to limit movement of said layers away from each other a predetermined distance, the edges of said layers being sealed to provide a leak-proof space betwen said layers, and a valve for introducing air into said wall to inflate it, said wall, when deflated, being highly flexible for movement thereof from end to end of said guideways.

15. A building structure comprising a roof section and a floor section having end edges and connecting edges therebetween, a guideway fixed to the bottom of said roof section adjacent said edges thereof and a guideway fixed to the upper surface of said floor section adjacent said edges thereof, said guideways being substantially in vertical registration and being of channel form opening toward each other, and an inflatable wall having its upper and lower edges arranged in the respective guideways, said wall having flexible impervious surface layers and closely arranged flexible connecting elements extending therebetween to limit movement of said layers away from each other a predetermined distance, the edges of said layers being sealed to provide a leak-proof space between said layers, a valve for introducing air into said wall to inflate it, said wall, when deflated, being highly flexible for movement thereof from end to end of said guideways, and means for suspending the upper edge of said wall relative to the guideway of said roof section for movement of said wall from end to end of said guideways.

16. A building structure comprising a roof section and a floor section having end edges and connecting edges therebetween, a guideway fixed to the bottom of said roof section adjacent said edges thereof and a guideway fixed to the upper surface of said floor section adjacent said edges thereof, said guideways being substantially in vertical registration and being of channel form opening toward each other, and an inflatable wall having its upper and lower edges arranged in the respective guideways, said wall having flexible impervious surface layers and closely arranged flexible connecting elements extending therebetween to limit movement of said layers away from each other a predetermined distance, the edges of said layers being sealed to provide a leak-proof space between said layers, a valve for introducing air into said wall to inflate it, said wall, when deflated, being highly flexible for movement thereof from end to end of said guideways, means for suspending the upper edge of said wall relative to the guideway of said roof section for movement of said wall from end to end of said guideways, and a vertical reel arranged adjacent one end of said guideways and to which one end of said wall is connected to be wound on said reel when deflated.

17. A building structure comprising a roof section and a floor section having end edges and connecting edges therebetween, a guideway fixed to the bottom of said roof section adjacent said edges thereof and a guideway fixed to the upper surface of said floor section adjacent said edges thereof, said guideways being substantially in vertical registration and being of channel form opening toward each other, and an inflatable wall having its upper and lower edges arranged in the respective guideways, said wall having flexible impervious surface layers and closely arranged flexible connecting elements extending therebetween to limit movement of said layers away from each other a predetermined distance, the edges of said layers being sealed to provide a leak-proof space between said layers, a valve for introducing air into said wall to inflate it, said wall when deflated, being highly flexible for movement thereof from end to end of said guideways, each guideway being provided with flanges between which the adjacent edge of said wall is movable, said flanges being spaced apart a distance slightly less than the distance between the outer faces of said surface layers when the latter are moved apart said predetermined distance to effect frictional engagement of said surface layers with said flanges.

18. A building structure comprising a roof section and a floor section having end edges and connecting edges therebetween, a guideway fixed to the bottom of said roof section adjacent said edges thereof and a guideway fixed to the upper surface of said floor section adjacent said edges thereof, said guideways being substantially in vertical registration and being of channel form opening toward each other, and an inflatable wall having its upper and lower edges arranged in the respective guideways, said wall having flexible impervious surface layers and closely arranged flexible connecting elements extending therebetween to limit movement of said layers away from each other a predetermined distance, the edges of said layers being sealed to provide a leak-proof space between said layers, a valve for introducing air into said wall to inflate it, said wall, when deflated, being highly flexible for movement thereof from end to end of said guideways, each of said guideways having opposite laterally extending channels forming tracks, and spaced anti-friction elements connected to the upper and lower edges of said wall and each having wheels movable in said tracks.

19. Apparatus constructed in accordance with claim 18 wherein said guideways further comprise spaced flanges between which the upper and lower edge portions of said wall are movable, said flanges being spaced apart such distance as to frictionally engage such edge portions of said wall when the latter is inflated.

20. Apparatus constructed in accordance with claim 18 wherein said guideways further comprise spaced flanges between which the upper and lower edge portions of said wall are movable, said flanges being spaced apart such distance as to frictionally engage such edge portions of said wall when the latter is inflated, and a reel extending vertically between said guideways at one end thereof and to which one end of said wall is connected whereby said wall, when deflated, is windable upon said reel.

21. A building structure comprising a roof and floor, and a side wall formed of sections hinged

respectively to said roof and said floor, said sections being approximately of equal width, means for swinging said sections outwardly to horizontal positions to form roof and floor sections each having end edges and a side edge extending outwardly from said roof and floor, guideways carried by said roof and floor sections against the lower and upper faces thereof respectively and adjacent said edges thereof, said guideways being vertically registered and forming channels opening toward each other, an inflatable wall having upper and lower edge portions movable from end to end of said guideways, said wall comprising impervious surface layers sealed at their edges to provide a leak-proof space therebetween, and flexible elements connecting said surface layers to each other to limit movement of said layers away from each other when said wall is inflated, and a valve for the introduction of pressure fluid into said wall to inflate it.

22. Apparatus constructed in accordance with

claim 21 wherein the means for swinging said wall sections outwardly comprises upper and lower pulleys, a cable passing around said pulleys and crossed therebetween to reverse rotation of said pulleys upon the pulling of said cable, and mechanical means for transmitting movement to said floor and roof sections upon operation of said pulleys incident to movement of said cable.

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