United States Patent [19]

Wenger et al.

[11] **3,908,787**

[45] **Sept. 30, 1975**

[54] **PORTABLE ACOUSTICAL SHELL AND RISER STRUCTURE**

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[73] Assignee: **Wenger Corporation,** Owatonna, Minn.

[22] Filed: **Oct. 9, 1974**

[21] Appl. No.: **513,268**

[52] **U.S. Cl.** ..... **181/30;** 160/40; 160/135; 160/351; 181/33 GB; 182/129

[51] **Int. Cl.²**.... **E04B 1/99;** E04G 1/00; A47G 5/00

[58] **Field of Search**..... 181/30, 33 HB; 160/40, 160/113, 135, 351, 136; 182/152, 129, 113, 46; 52/70, 71

[56] **References Cited**

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3,630,309	12/1971	Wenger et al.	181/30
3,747,706	7/1973	Paine et al.	182/113

Primary Examiner—Stephen J. Tomsky
Assistant Examiner—John F. Gonzales
Attorney, Agent, or Firm—Wegner, Stellman, McCord, Wiles & Wood

[57] **ABSTRACT**

A portable acoustical shell and riser structure including a step unit with a pivotal linkage frame system movable between an operative position with a series of vertically-spaced steps and a compacted position wherein floor-engaging wheels are positioned for floor engagement and an acoustical shell pivotally hinged to the step unit for movement between a transport position wherein the acoustical shell is closely spaced to the step unit for movement of the entire structure to various locations on the floor-engaging wheels and for storage. Additionally, the acoustical shell can be moved to an operative position extending generally upright and at an angle to the step unit whereby performers, such as a choral group, may stand on the steps and with the acoustical shell enhancing the sound. The structure additionally has mechanisms for placing parts of the acoustical shell at a desired angle relative to each other and a filler panel assembly for spanning the space between adjacent structures and with further mechanisms to assure locking of the components in operative use positions and to assure a fixed relation between the components when the structure is being transported on the floor-engaging wheels.

16 Claims, 16 Drawing Figures

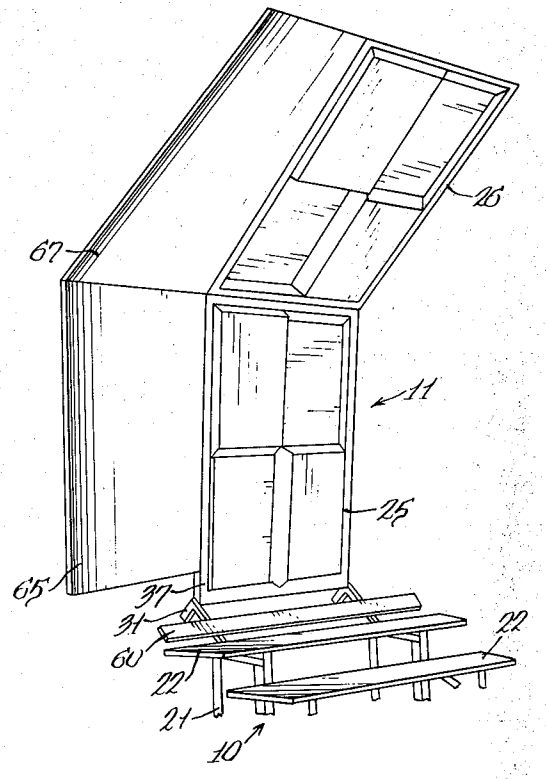


Fig. 1.

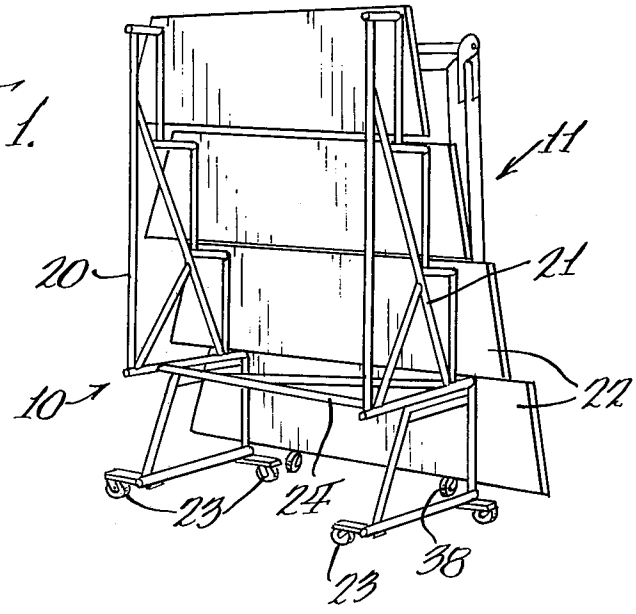

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Fig. 2.

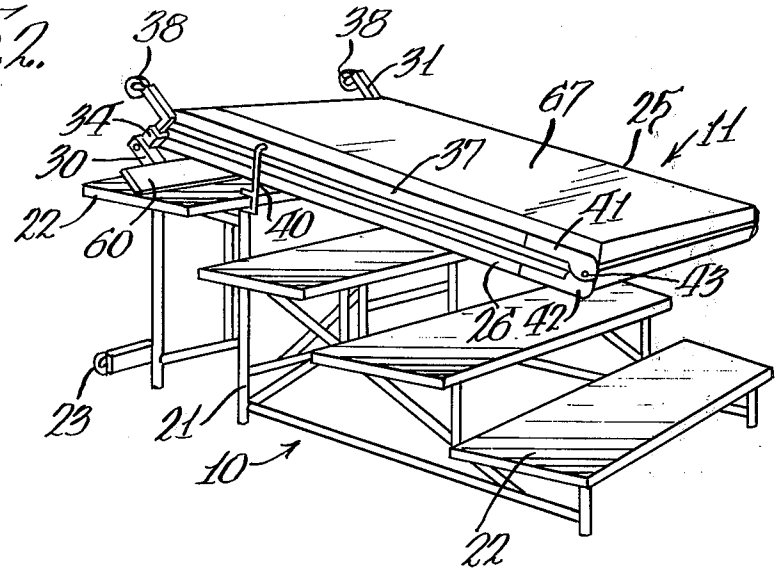

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Fig. 3.

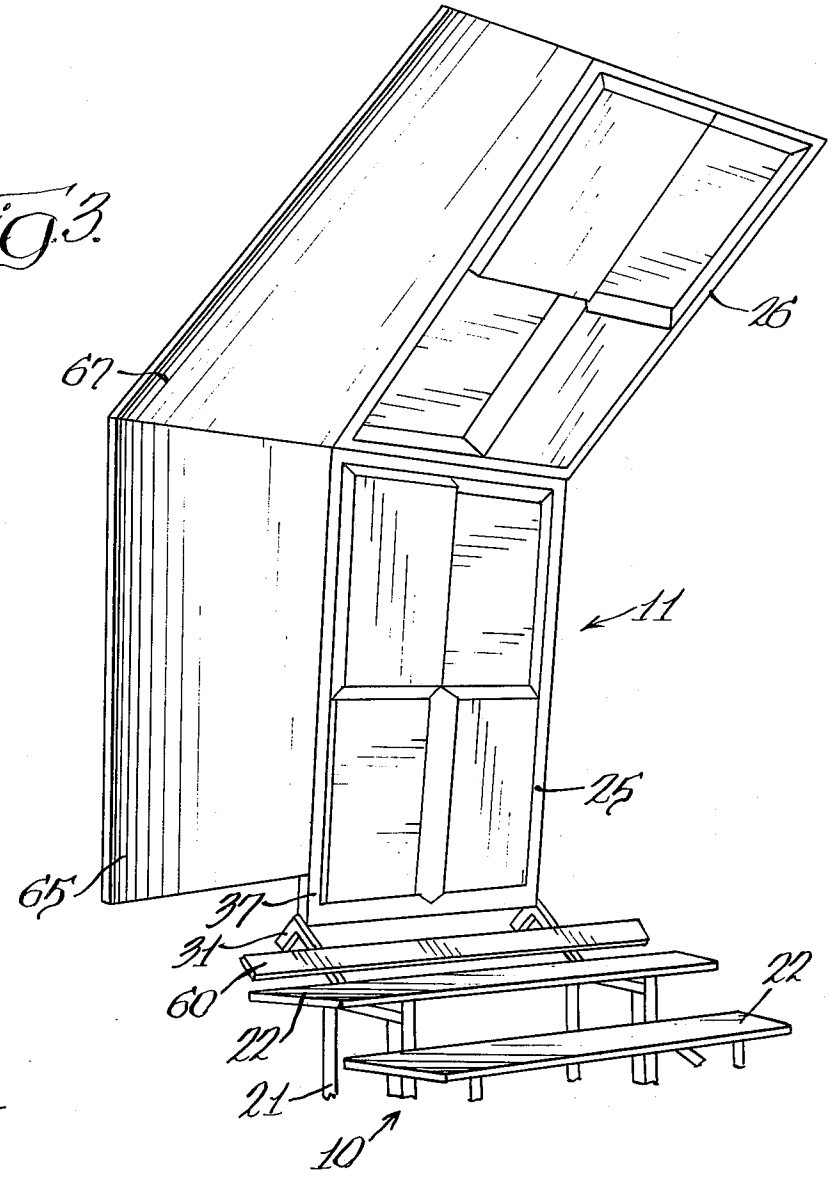


Fig. 4.

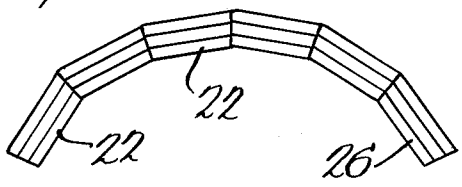


Fig. 5.

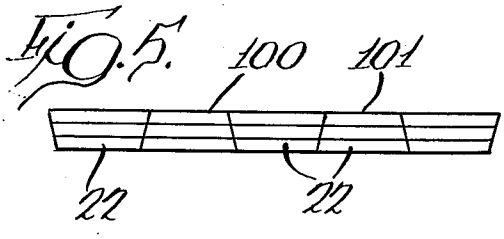


Fig. 6.

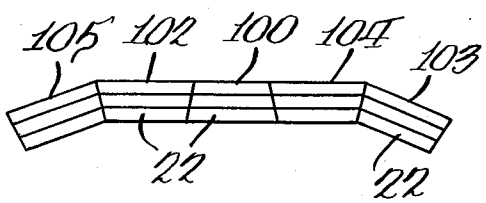
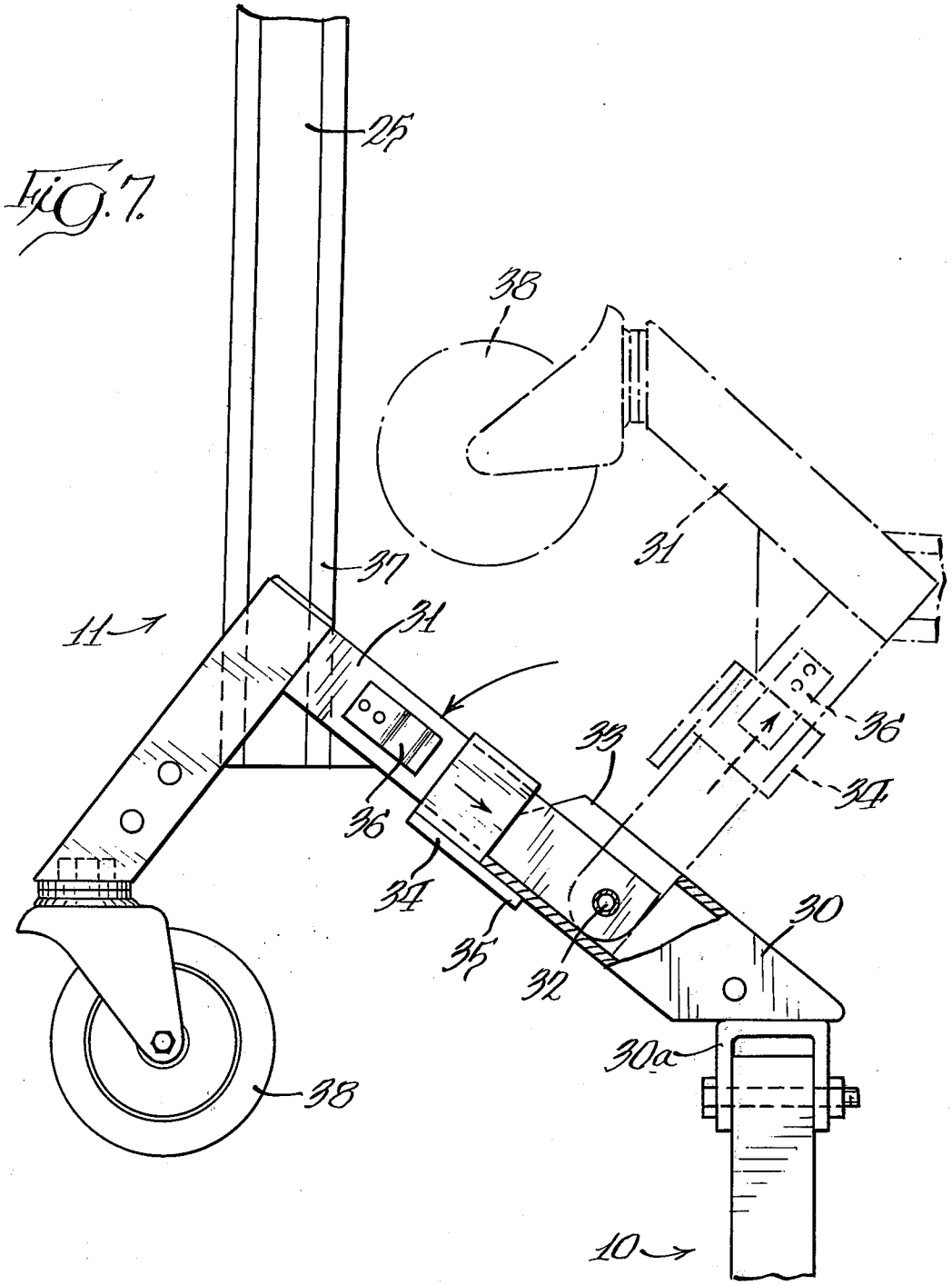


Fig. 7.



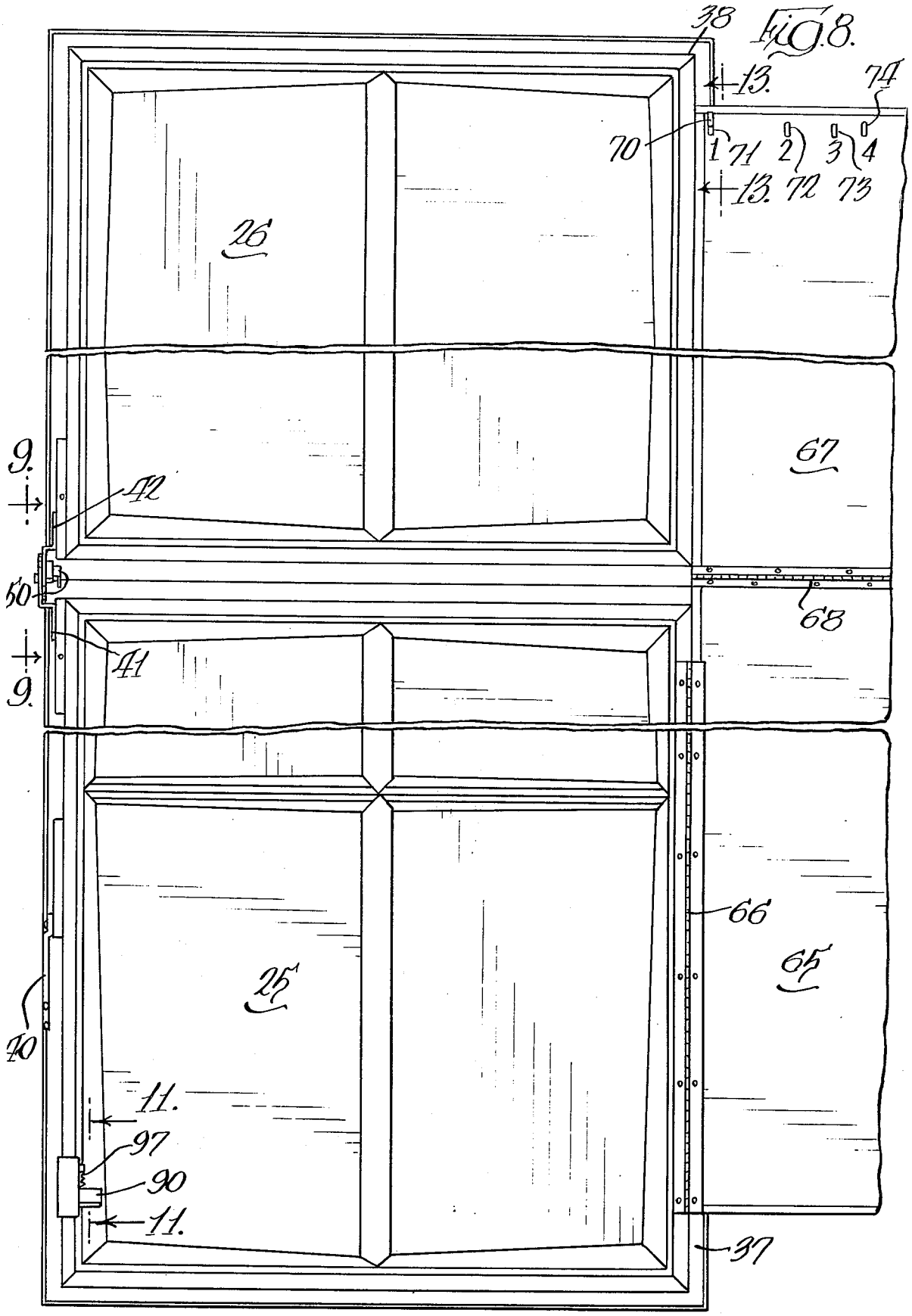

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FIG. 8.

Fig. 9.

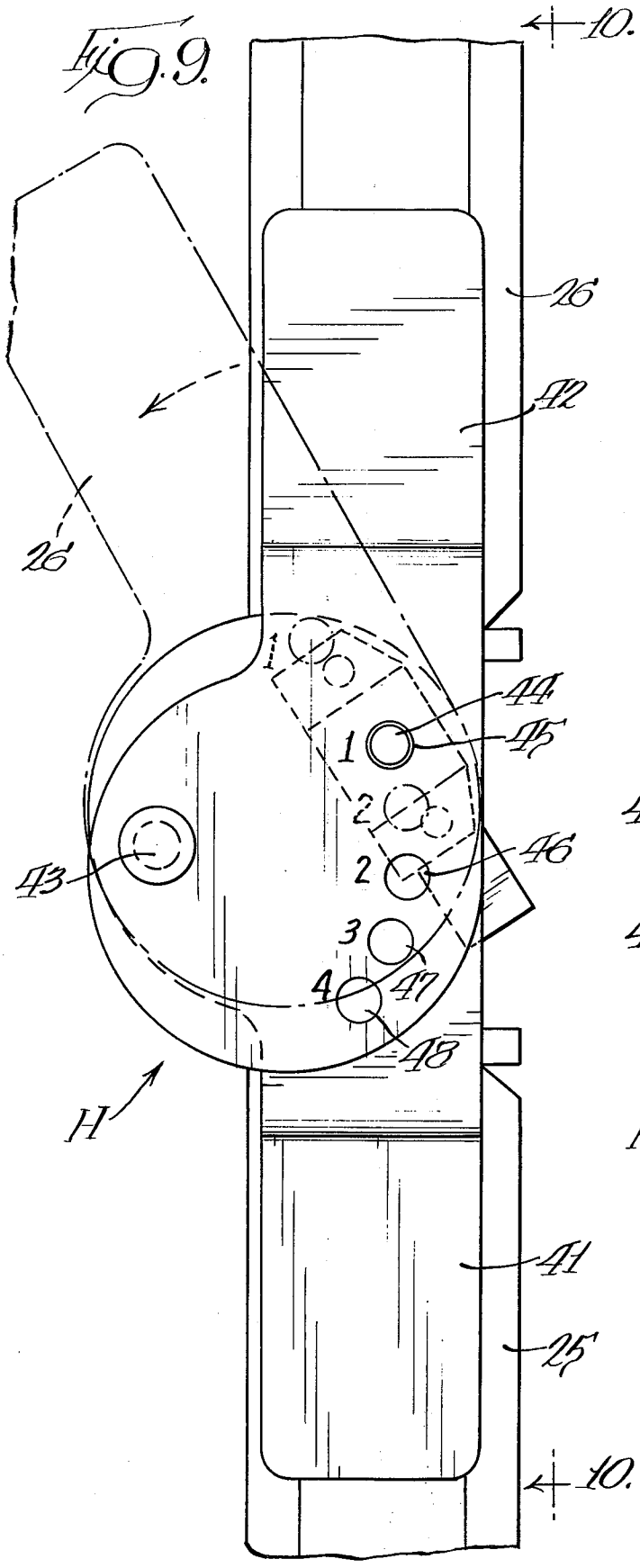

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Fig. 10.

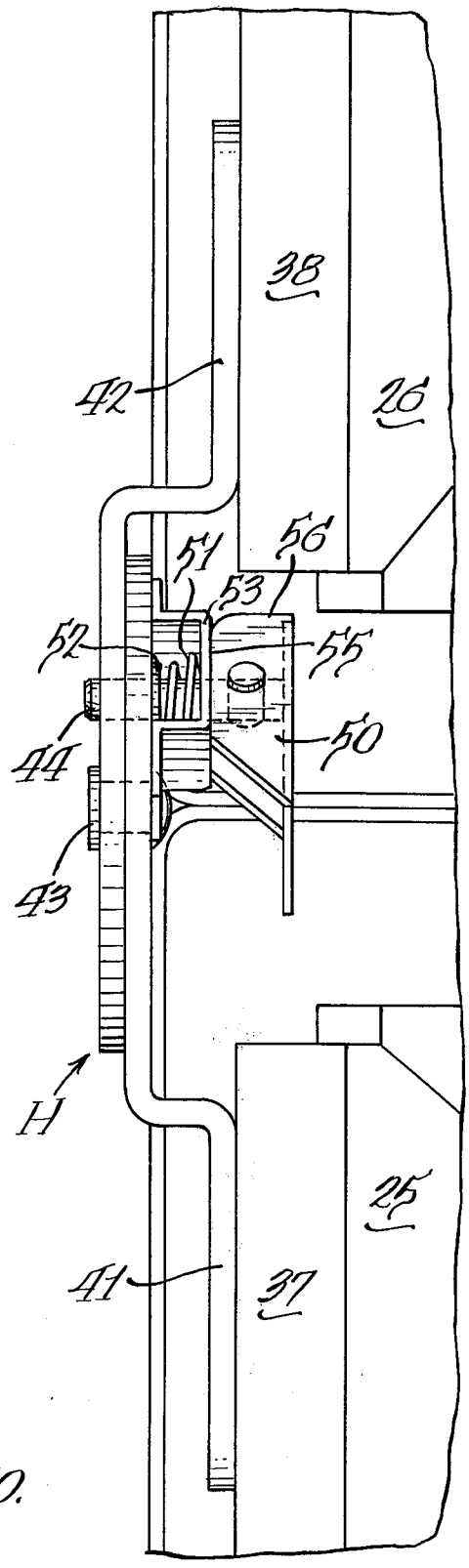

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Fig. 11.

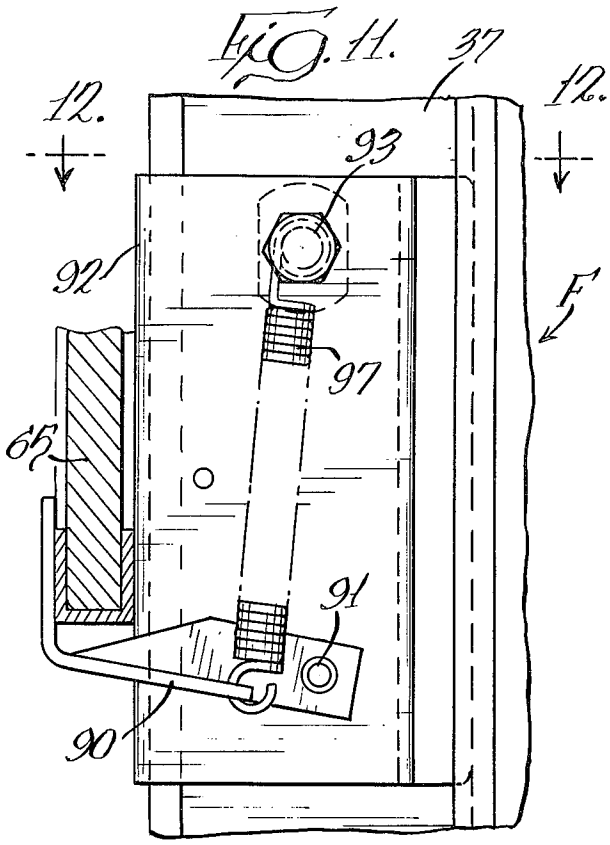


Fig. 12

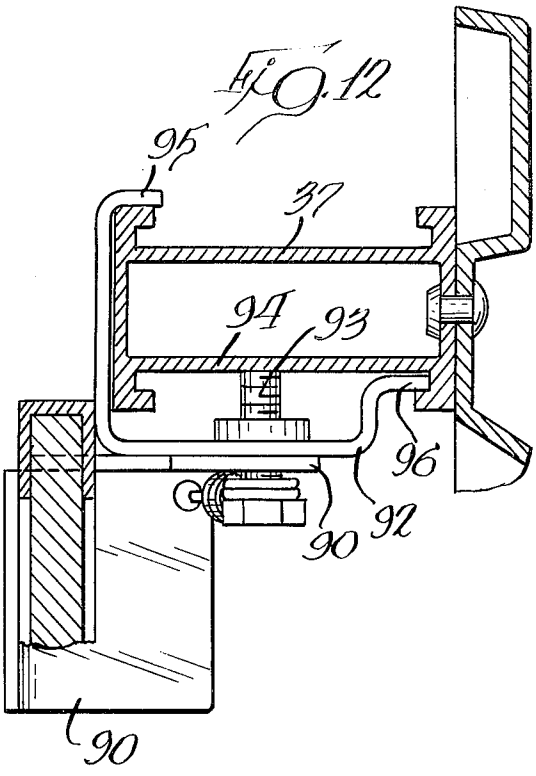


Fig. 13.

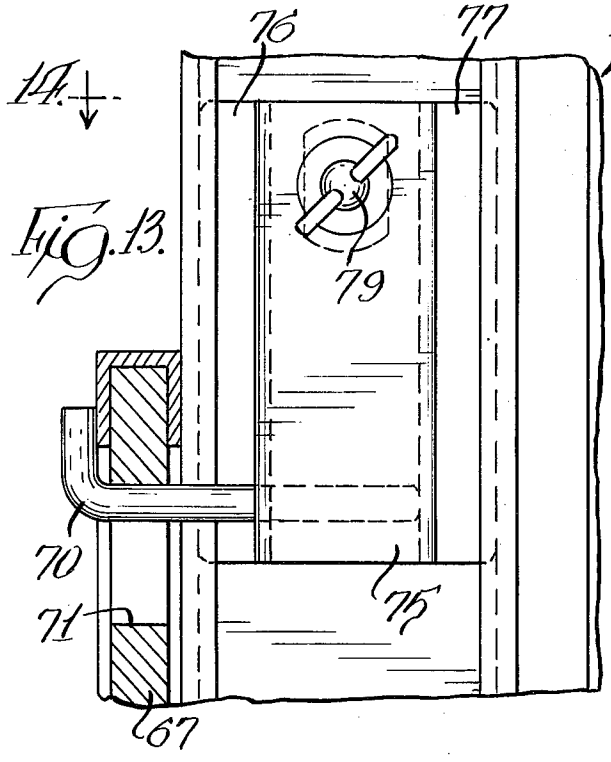


Fig. 14.

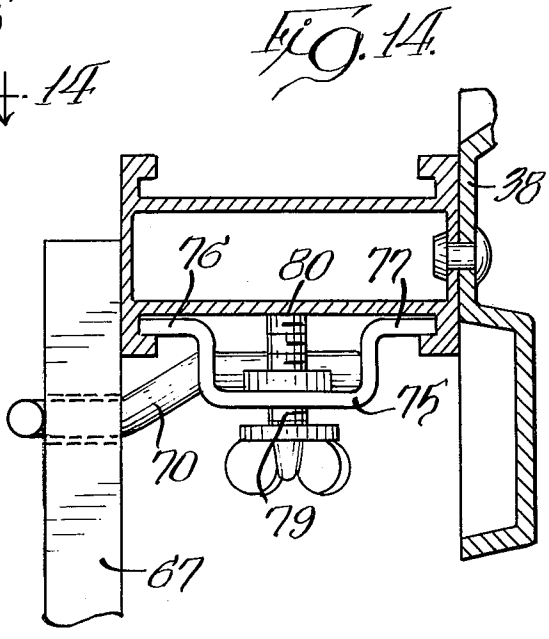


Fig. 15.

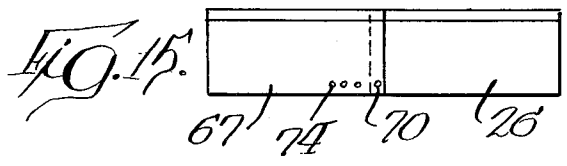
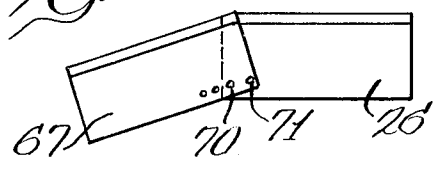


Fig. 16.



PORTABLE ACOUSTICAL SHELL AND RISER STRUCTURE

BACKGROUND OF THE INVENTION

This invention pertains to structure primarily used in association with the performing arts and, more particularly, a portable acoustical shell and riser structure which may be placed in a compact condition and has floor-engaging wheels for storage and transport of the structure and which may be easily erected to an operative position merely by the operation of various latch and lock mechanisms and movement of parts about pivotally-hinged connections.

Fixed acoustical treatment for auditoriums and the like is well known. Portable acoustical shells are often used in schools and at other locations wherein an acoustical shell having pivotally interconnected panels has a frame with floor-engaging wheels permitting transport of the shell between a storage location and various locations for use with the shell panels then being moved to an operative position. Examples of such structures are shown in U.S. Pat. Nos. 3,180,446 and 3,630,309, issued to the assignee of this application.

Also in the performing arts, it is frequently desirable to have choral groups, for example, positioned at different vertical levels and portable riser structures for achieving this are known. In many instances, such portable risers have fixed frames; however, a more versatile unit has a series of vertically-spaced steps carried by a frame linkage system which can move between an extended position for use and a compacted position to reduce the size of the riser structure for transport and storage. Such structure also has floor-engaging wheels to enhance portability. Examples of such structures are shown in Pat. Nos. 3,747,706 and 3,747,708, issued to the assignee of this application.

Frequently, it is desirable to have both portable riser structure and acoustical shell structure used at the same time and otherwise placed in storage. In the past, these structures have been separate and, therefore, have involved duplication of substantial structure providing for support and transport of the various components and have increased the time and labor involved in handling of the structure.

SUMMARY

A feature of the invention disclosed herein is to provide a portable acoustical shell and riser structure wherein the riser structure is constructed with a linkage system to permit extension of the steps into operative position or positioning of the riser structure in a compact relation for transport and storage and with floor-engaging wheels provided thereon and with a portable acoustical shell mounted to the riser structure for transport and storage therewith and support by the riser structure and which may be easily erected into a desired operative position by operation of mechanism permanently associated with the structure.

A further feature of the aforesaid structure has the acoustical shell with a filler panel assembly permanently attached thereto which may extend laterally from the acoustical shell when in operative position in order to coact with an adjacent structure in a multiple structure assembly and close any gap between adjacent acoustical shells. The filler panel assembly is mounted to the acoustical shell for movement between a folded, storage position and an operative position and both the shell and the filler panel assembly have upper and lower panels with the upper shell panel being positionable at various angles of outward extension and with the upper filler panel being adjustably connected thereto at different degrees of overlap in order to span the gap between adjacent upper shell panels regardless of the angle of extension thereof.

Additionally, the upper acoustical shell panel is hinged to the lower acoustical shell panel for movement between positions of close adjacency for transport and in operative position with the upper shell panel extending upwardly from the lower shell panel and with the hinge means incorporating positive lock structure for holding the upper shell panel at any one of a plurality of preselected angles relative to the lower shell panel.

Another feature of the invention is to provide for latch or lock structure for securely holding the various components in compact relation for transport and storage, including latch means for holding the acoustical shell in closely-spaced relation to the riser structure and additional means carried by the acoustical shell for holding the filler panel assembly in closely-spaced parallel relation with the acoustical shell panels and with the latter means also functioning to engage and hold a laterally-extended filler panel of an adjacent structure when plural of said structures are positioned adjacent each other in use.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the portable acoustical shell and riser structure shown in transport position except for the riser structure having been moved from a compacted position to an extended position but with the floor-engaging wheels still operative;

FIG. 2 is a perspective view of the structure shown in FIG. 1 which has been rotatably tipped to place the riser structure in operative position and remove the support thereof by the floor-engaging wheels and with the acoustical shell structure still in transport position;

FIG. 3 is a front elevational view with part of the riser structure broken away and with the acoustical shell shown in one of its operative positions;

FIG. 4 is a diagrammatic view showing a curved relation of a plurality of the structures shown in FIG. 3;

FIG. 5 is a diagrammatic view, showing a plurality of these structures associated in straight line;

FIG. 6 is a diagrammatic view showing a further arrangement of a plurality of structures;

FIG. 7 is a fragmentary side elevational view of the pivot structure interconnecting the acoustical shell and the riser structure, with parts broken away, and with an alternate position shown in broken line;

FIG. 8 is a rear elevational view, on an enlarged scale and with parts broken away, of the acoustical shell structure as shown in FIG. 3 and with the upper shell panel at a different angle;

FIG. 9 is a fragmentary elevational view, on a further enlarged scale and taken generally along the line 9—9 in FIG. 8;

FIG. 10 is a fragmentary elevational view, taken along the line 10—10 in FIG. 9;

FIG. 11 is a fragmentary view, on an enlarged scale, taken generally along the line 11—11 in FIG. 8;

FIG. 12 is a plan section, taken generally along the line 12—12 in FIG. 11;

FIG. 13 is a fragmentary view, on an enlarged scale, taken generally along the line 13—13 in FIG. 8;

FIG. 14 is a plan section, taken generally along the line 14—14 in FIG. 13;

FIG. 15 is a diagrammatic view, showing the relation of an upper filler panel with an upper acoustical shell panel at one angle of the acoustical shell panel; and

FIG. 16 is a view, similar to FIG. 15, showing a different relation of the filler panel when the upper acoustical shell panel is at a different angle.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A general understanding of the invention disclosed herein may be obtained from consideration of FIGS. 1 to 6. The structure includes a riser structure, indicated generally at 10, and an acoustical shell, indicated generally at 11, with the riser structure being of the type as generally shown in U.S. Pat. No. 3,747,708 wherein a frame linkage system includes a pair of side frames 20 and 21 pivotally connected to the underside of a plurality of steps 22 and having, at their lower ends, floor-engaging wheels 23. The side frames 20 and 21 are shown in extended position in FIGS. 1 and 2. While in full transport condition, the side frames 20 and 21 would be pivoted relative to the steps 22 to a position substantially parallel thereto to reduce the over-all width of the unit as viewed looking toward the right-hand side of FIG. 1. The riser structure is shown in extended position in FIG. 1, with the side frames 20 and 21 held in erected condition by a brace member 24. This structure is more particularly shown and the operation thereof described in the aforesaid patent, owned by the assignee of this application and the disclosure thereof is incorporated herein by reference.

With the riser structure extended, as shown in FIG. 1, the structure is rotatably tipped to a position, as shown in FIG. 2, wherein the steps 22 are vertically-spaced for support of a plurality of rows of persons as in a choral group.

The structure is in an intermediate condition, as shown in FIG. 2, wherein the acoustical shell 11 is still in a transport condition and must be operatively extended to an operative position as shown in FIG. 3. The acoustical shell includes a lower shell panel 25 and an upper shell panel 26 which are hinged together along their adjacent edges and with the lower shell panel 25 additionally hinged to the riser structure whereby the acoustical shell 11 can be raised from the transport position of FIG. 2 to the operative position of FIG. 3. The shell panels each have a surround frame with acoustical surfaces.

The acoustical shell 11 is pivotally connected to the riser structure by a pivot assembly, shown particularly in FIG. 7. The structure shown in FIG. 7 is duplicated at each side of the riser structure 10 and includes a tubular arm 30 secured to a bracket 30*a*, as by welding, and with the bracket 30*a* pivoted to the frame of the riser structure. An L-shaped arm 31 of tubular construction is pivoted to arm 30 at 32 and movable between an operative use position for the acoustical shell 11, shown in full line in FIG. 7, and a position, shown in broken line, wherein the acoustical shell is positioned for transport, as shown in FIG. 2. The pivotal movement to the broken line position of FIG. 7 is permitted by a slot 33 formed in the upper side of the tubular arm 30. The acoustical shell 11 is locked in operative position, as shown in full line in FIG. 7, by a slidable lock member 34 which, in locked position, has a flange 35 overlapping the lower surface of the arm 30. This lock is a tubular member which is slidably movable on the arm 31 and which may be retained in an unlocked position by frictional engagement with a spring member 35 (as shown in broken line in FIG. 7). The flange 35 of the lock prevents clockwise pivoting of the arm 31 with respect to the arm 30, as viewed in FIG. 7, while counterclockwise movement is prevented by engagement of the arm 31 with the interior surface of the lower part of the arm 30.

The arm 31 is secured to the surround frame member 37 of an acoustical lower shell panel and with the free end of the arm carrying a floor-engaging wheel 38 whereby added stability is provided for the structure when in transport position with the wheels 38 as well as the wheels 23 engaging the floor.

With the acoustical shell 11 in transport and storage condition, as shown in FIG. 2, the arm 31 is in the broken line position of FIG. 7 and the acoustical shell structure is held locked to the riser structure by a pair of locks 40, one of which is shown in FIG. 2. The lock 40 is pivotally mounted on the shell surround frame 37 and has a bifurcated end to engage both sides of the upper step 22 and hold the shell in a position extending generally parallel to the step unit. A similar lock member 40 is located at the side of the shell not visible in FIG. 2.

Continuing with the sequence in movement of the structure to operative position from the previously described intermediate condition of FIG. 2, it will be seen that the lock members 40 are pivoted to release the engagement with the upper step 22 and then the acoustical shell 11 is raised by pivoting of arms 31 relative to arms 30 of the pivot mountings for the acoustical shell. With the acoustical shell having a lower panel 25 and an upper panel 26, the next step in operation is to dispose the upper shell panel at a predetermined angle relative to the lower shell panel prior to final positioning, as shown in FIG. 3. The upper shell panel 26 is pivotally connected to the lower shell panel by a pair of hinge assemblies located, one at each vertical edge of the two panels. One of the hinge assemblies and lock means associated therewith is shown particularly in FIGS. 9 and 10. The hinge assembly, indicated generally at H, includes a hinge arm 41 connected to the surround frame member 37 of the lower shell panel and a hinge arm 42 connected to a surround frame member 38 of the upper shell panel 26. These two hinge arms overlap and are pivotally connected together for relative pivoting movement by a pin in the form of a rivet 43 extending therethrough. This permits pivoting of the shell panels relative to each other between a position wherein the upper shell panel 26 extends vertically upward from the lower shell panel, as shown in full line in FIG. 9, to a variety of preselected angular positions for the upper shell panel and one of which is indicated in broken line in FIG. 9. Analysis has shown that three angular positions of the upper shell panel 26, other than upright, are adequate to meet a variety of conditions as to over-all height and size of room in which the structure is used and these four positions are obtained by a lock structure including a detent pin 44 carried by the hinge arm 41 and which coacts with any one of four different openings 45, 46, 47, and 48 in hinge arm 42 and disposed along an arcuate line about the pivot pin 43 as

the center. As shown in FIG. 9, the pin 44 is in opening 45 which provides for position 1 whereby the upper shell panel 26 is vertical. The opening 46 provides for position 2 which is at an angle of approximately 30° from the vertical. The opening 47 provides for a position 3 which provides for an angle of 45° from the vertical; while the opening 48 provides for position 4 which has the upper shell panel 26 at an angle of approximately 60° from the vertical.

The pin 44 is mounted for retraction by connection to a manually-operable actuator 50 which is self-retaining, either in the position shown in FIG. 10 or at a position rotated counterclockwise 90° therefrom to lock the pin 44 in retracted position. A spring 51 acts between a C-washer 52 fitted in a groove in the locking pin 44 and a member 53 carried on the hinge arm 41 to normally urge the pin 44 into extended position into one of the holes 44-48 and to maintain the manual actuator 50 in either of the positions shown in FIG. 10 wherein surfaces 55 thereof engage the member 53 or, alternatively, wherein surfaces 56 of the manual actuator engage the member 53 and with the detent pin 44 retracted. This structure is operated to set the angle of the upper shell panel 26 relative to the lower shell 25 by raising the acoustical shell 11 from the position shown in FIG. 2 a sufficient distance to permit outward pivoting of the upper shell panel 26. The desired angle of the upper shell panel is then set by operation of the structure shown in FIGS. 9 and 10 and the acoustical shell 11 is then raised to the position shown in FIG. 3 and the locks 34 of the pivot assembly, shown in FIG. 7, are then lowered to the full line position shown therein to maintain the acoustical shell in operative position. At this time, a pivoted step guard 60 can be pivoted from the position of FIG. 2 to the position of FIG. 3 to partially span the space between the upper step 22 and the lower edge of the acoustical shell lower panel 25.

As explained more fully hereinafter, a number of the portable acoustical shell and riser structures may be used in association with each other and there is a resulting space between the acoustical shells of adjacent structures. For improved acoustical properties as well as appearance, it is desirable to span the spaces between adjacent acoustical shells and, for this purpose, each of the structures has a filler panel assembly associated therewith. The filler panel assembly is shown in operative position from the front of the structure in FIG. 3 and from the rear of the structure in FIG. 8. A lower filler panel 65 is pivotally hinged along an adjacent edge to the lower acoustical shell panel 25 by means, such as a piano hinge 66. An upper filler panel 67 is hinged along an adjacent edge to the upper edge of the lower filler panel 65 by means such as piano hinge 68. The hinging of the filler panels to each other and to the lower acoustical shell panel permits a folding downwardly of the upper filler panel 67 toward the front face of the lower filler panel 65, as viewed in FIG. 3, to have the front faces of both filler panels in facing relation and then pivotal movement of the filler panels about the hinge 66 into a position of storage within the surround frame 37 of the lower acoustical panel 25 and with the upper filler panel 67 positioned uppermost, as viewed in FIG. 2.

In setting up the filler panel assembly and after the angle of the upper acoustical panel 26 has been set relative to the lower acoustical panel 25, the filler panel assembly is pivoted upwardly and outwardly from the back of the lower acoustical panel 25 followed by pivoting of the upper filler panel 67 relative to the lower filler panel by movement permitted by the hinge 68.

It will be noted that all of the panels of both the acoustical shell and the filler panel assembly are generally rectangular whereby if the upper acoustical shell panel 26 extends vertically upward, the filler panels 65 and 67 will extend vertically upward adjacent the acoustical shell panels. This is illustrated in the rear elevational view of FIG. 8. With the upper filler panel 67 being supported only by the hinge 68, it is necessary to secure the upper filler panel to the upper acoustical shell panel 26. In the relative positions shown in FIG. 8, this is accomplished by having a hook 70 carried by the upper acoustical shell panel 26 engaged in an opening 71 at the upper edge of the upper filler panel 67. This is the relation when the upper acoustical shell panel extends upward vertically from the lower shell panel and the lower filler panel 65 is to be coplanar with the lower acoustical shell panel 25. There are additional openings 72, 73, and 74 which are coded similarly to the coding of the pivot assembly holes 44–48, shown in FIG. 9, which control and establish the angle of the lower filler panel relative to the lower shell panel.

The hook 70 and associated structure are shown particularly in FIGS. 13 and 14 wherein the hook 70 is fixed to a carrier 75 having a pair of flanges 76 and 77 slidable within associated grooves formed in the surround frame 38 of the upper acoustical shell panel 26. The carrier 75 has sliding movement in order to permit insertion of the hook 70 in any one of the openings 71–74 followed by upward movement of the hook, as viewed in FIG. 13, to securely overlie the upper filler panel 67. When this is accomplished, the threaded member 79 is advanced into engagement with a wall 80 of the surround frame to firmly hold the flanges 76 and 77 against the outer surfaces of the associated grooves and, in effect, lock the hook 70 in position. This variable location of the hook in one of the openings 71–74 of the upper filler panel is diagrammatically shown in FIGS. 15 and 16 wherein, in FIG. 15, the relation is as illustrated in FIG. 8.

The filler panel assembly, when in transport position of the structure, nests behind the lower acoustical shell panel 25 and a latch assembly is provided in order to hold the filler panel assembly in such relation during transport. This structure is shown particularly in FIGS. 8, 11 and 12. This latch assembly has the added function of coacting with a free edge of a lower filler panel 65 of an adjacent structure to secure said free edge against movement and this particular operation is specifically shown in FIGS. 11 and 12. The latch assembly includes a latch member 90 pivoted at 91 to a clip 92 slidably engaged with a section of the panel surround frame member 37 and which is held in adjusted position by firm extension of a threaded member 93 into engagement with a section 94 of the surround frame which causes a reaction of clip sections 95 and 96 against adjacent parts of the surround frame surfaces to hold the clip 92 firmly in position. The threaded member 93 has one end of a spring 97 engaged therewith and with the opposite end of the spring connected to the latch member 90 and urging the latch member in a clockwise direction of rotation as viewed in FIG. 11. As shown in FIGS. 11 and 12, the latch member 90 is

urged by the spring **97** into engagement with a lower filler panel **65** of an adjacent structure to hold the filler panel in firm relation with the remainder of the structure. The latch member **90** also functions to hold the folded filler panel assembly within the interior of the rear side of the lower acoustical shell panel **25**, as will be evident in FIG. **8** wherein the latch member **90** overlies this cavity at the rear of the acoustical shell panel **25**.

Referring now to FIGS. **4** to **6** wherein several of the possible arrangements of the structure are shown and wherein the step structures are diagrammatically illustrated, it will be noted that in FIG. **4** a curved configuration is provided. This is obtained by the fact that the steps **22** of a step unit are of variable length with the lowest step being shorter than the highest step so that in the arrangement of FIG. **4** there will be a continuity of step surfaces at each step level. This is particularly evident in FIG. **1** wherein the highest step, which is at the bottom of the structure, is longer than the lowest step, which is at the top of the structure, as viewed in FIG. **1**. Further, as seen in FIGS. **1** and **3**, the acoustical shell panels **25** and **26** have a width substantially less than the step unit. Thus as the step units are related as shown in FIG. **4**, there is a space between the acoustical shell panels of adjacent structures and it is the function of the filler panel assembly to span these spaces.

In the arrangement of FIG. **5**, it is necessary to have certain of the structures provided with step units which are the reverse of those shown in the drawings wherein the units **100** and **101** have the highest step shorter than the lowest step.

In the arrangement of FIG. **6**, there is a single reverse unit **100** used, with the other units being of the structure shown specifically in this application. Thus, the filler panel assembly spans the space between adjacent acoustical shells and the upper filler panel **67** of each filler panel assembly follows the upper acoustical shell panel **26** in all angular relations thereof with respect to the lower acoustical shell panel **25**. There is a corresponding angular relation of the lower filler panel **65** relative to the acoustical shell.

More specifically in FIG. **4**, the upper filler panel **67** should have one of the openings **71–74** associated with the hook **70** which corresponds with the position opening of the hinge assembly of FIG. **9**. If position **2** is used in the hinge assembly of FIG. **9**, then position **2** should be used with the filler panel. In a straight-line arrangement as viewed in FIG. **5**, then the position **1** opening of the upper filler panel should be used, namely, opening **71** for association with the hook **70**. In the arrangement of FIG. **6**, the units **102** and **103** should have the position opening on the filler panel correspond to the position opening on the hinge assembly of FIG. **9**, while the unit **100** and a unit **104** have position **1** opening of the filler panel used in association with the hook **70**. A unit **105** has its filler panel assembly closed and inactive. It will be seen that the angle of the lower filler panel is set by the relation of the hook **70** to one of the openings **71–74**.

Starting from the operative position of FIG. **3**, movement of the structure to a storage position is commenced by release of the lock members **34** of the pivot mountings of the acoustical shell to the riser structure and with a gentle lowering of the acoustical shell structure to place the upper edge of the upper acoustical shell panel **26** in engagement with the floor. The hook **70** is then released from the upper filler panel **67**, the filler panels moved to an angle relative to the shell panels and the upper filler panel **67** is then folded downwardly against the front face of the lower filler panel **65** and the associated panels are then pivoted about the hinge **66** to nest within the rear of the lower acoustical panel **25**. The latch assembly shown in FIGS. **11** and **12** is moved into position to hold the filler panel assembly in association with the acoustical shell. The acoustical shell is then raised a sufficient distance to permit movement of the front face of the upper acoustical shell panel **26** toward the front face of the lower acoustical shell panel **25**, as permitted by release of the detents associated with the hinge structure therefor shown in FIGS. **9** and **10**. When this is accomplished, the acoustical shell is then brought to the position shown in FIG. **2** and the travel latches **40** are moved into locked relation with the upper step **22**. Previously, the step guard **60** has been moved to the position shown in FIG. **2**. The structure is then rotatably tipped to the position of FIG. **1** and then the side frames **20** and **21** of the step unit are pivoted relative to the steps to lie closely adjacent thereto. The structure is then in a compact storage condition and for transport along the floor including support by the wheels **23** of the step unit as well as the wheels **38** carried by the arms **31** of the pivot mounting assembly for the acoustical shell. Reverse of the foregoing operations sets up the structure for use.

We claim:

1. A portable acoustical shell and riser structure including a step unit having a pivotal linkage system movable between transport and operative positions and having floor-engaging wheels positioned for floor engagement in the transport position and a series of vertically-spaced steps for use in the operative position, an acoustical shell, and means for piviotally hinging said acoustical shell to said step unit for movement between a transport position in closely spaced relation to said step unit and an operative position extending generally upright and at an angle to said step unit.

2. A structure as defined in claim **1** wherein said pivotal hinge means carries additional floor-engaging wheels to provide added stability in transport.

3. A structure as defined in claim **1** including means for latching said acoustical shell to said step unit in both of said shell positions.

4. A structure as defined in claim **1** wherein said acoustical shell includes upper and lower panels with said pivotal hinge means connected to said lower panel, second hinge means pivotally connecting said upper panel to said lower panel, and means for locking said upper panel at one of a plurality of different angles with respect to said lower panel.

5. A structure as defined in claim **4** wherein said locking means includes a spring loaded lock pin on one part of said second hinge means and a series of lock pin receiving openings on a second part of said second hinge means and which are arcuately disposed about a pivot axis for said two parts of the second hinge means.

6. A structure as defined in claim **4** including a filler panel assembly for extension laterally of said acoustical shell when the latter is in operative position to close the gap between acoustical shells of two of said structures positioned adjacent to each other.

7. A structure as defined in claim **6** wherein said filler panel assembly includes upper and lower pivotally interconnected filler panels generally coextensive with

the upper and lower shell panels, and said lower filler panel and shell panel being vertically hinged together along an adjacent edge.

8. a structure as defined in claim **7** including a filler panel latch for holding said filler panels in folded back-to-back relation with the acoustical shell when in transport position.

9. A structure as defined in claim **8** including means mounting said filler panel latch for engagement with a filler panel of an adjacent structure when two of said structures are positioned adjacent each other.

10. A structure as defined in claim **7** wherein said upper filler panel and upper shell panel are movable independently of each other and means for holding said last-mentioned parts in overlapped fixed relation and in variable amounts to set the angle of the lower filler panel relative to said lower shell panel.

11. A portable acoustical shell structure including upper and lower shell panels, hinge means interconnecting said shell panels for movement between a transport position wherein the panels are in face-to-face relation and an operative position wherein the upper shell panel extends upwardly from the lower shell panel, means associated with the hinge means for locking said panels in any one of several different angular relations, a filler panel assembly including upper and lower filler panels hinged together along adjacent edges, said lower filler panel being hinged to said lower shell panel along adjacent edges and an axis extending heightwise thereof, means for latching said filler panel assembly to said lower shell panel for transport with said filler panels in face-to-face relation, and means for locking said upper filler panel to said upper shell panel when in operative position with the filler panels extended laterally of the shell panels and with varying degrees of overlap dependent upon the angularity of the lower filler panel to the lower shell panel, and floor-engaging rollers for transport of said structure.

12. A structure as defined in claim **11** wherein said filler panel latching means includes a latch member pivoted to said lower shell panel and extendable beyond a rear face of the lower shell panel to engage a filler panel, said latch member also being engageable with an operatively positioned filler panel of an adjacent structure when a plurality of said structures are associated in use.

13. A structure as defined in claim **11** including a step unit, means hinging said shell structure to said step unit, and said floor-engaging rollers being both on said step unit and on said shell structure.

14. A structure as defined in claim **13** wherein said last-mentioned hinging means permits disposition of said shell structure adjacent said step unit for transport and extension of the shell structure upwardly from the step unit in operative position, and locking means associated with the hinging means to maintain the last-mentioned relation.

15. A portable acoustical shell and riser structure including a step unit having a pivotal linkage frame system movable between transport and operative positions and having floor-engaging wheels positioned for floor engagement in the transport position and a series of vertically-spaced steps for use in the operative position, an acoustical shell, means for pivotally hinging said acoustical shell to said step unit for movement between a transport position in closely spaced relation to said step unit and an operative position extending generally upright and at an angle to said step unit, said acoustical shell having upper and lower shell panels hinged together along an adjacent edge by hinge structure, detent means associated with the hinge structure for the shell panels and engageable in a selected one of a plurality of arcuately arranged openings in a hinge member of said hinge structure for locating the upper shell panel at a predetermined angle relative to the lower shell panel, releasable means for locking the acoustical shell to the step unit when in said transport position, releasable means for locking the acoustical shell in operative position relative to said step unit, and a filler panel assembly including upper and lower filler panels positioned to extend laterally from the acoustical shell panels when in operative position and with the lower filler panel hinged to the lower shell panel along an adjacent edge, and means for connecting the upper filler panel to the upper shell panel at different locations with differing degrees of overlap between said latter panels to cause and be dependent upon the desired orientation of the lower filler panel relative to the lower acoustical shell panel.

16. A structure as defined in claim **15** wherein said means pivotally hinging the acoustical shell to the step unit includes arms connected to the acoustical shell, and floor-engaging wheels carried by said arms to be positioned at a distance from the floor-engaging wheels of the riser structure to provide added stability in transport and storage of the structure.

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