April 27, 1965 H. J. WENGER 3,180,446

PORTABLE SOUND SHELL

Filed Nov. 17, 1961 6 Sheets-Sheet 1

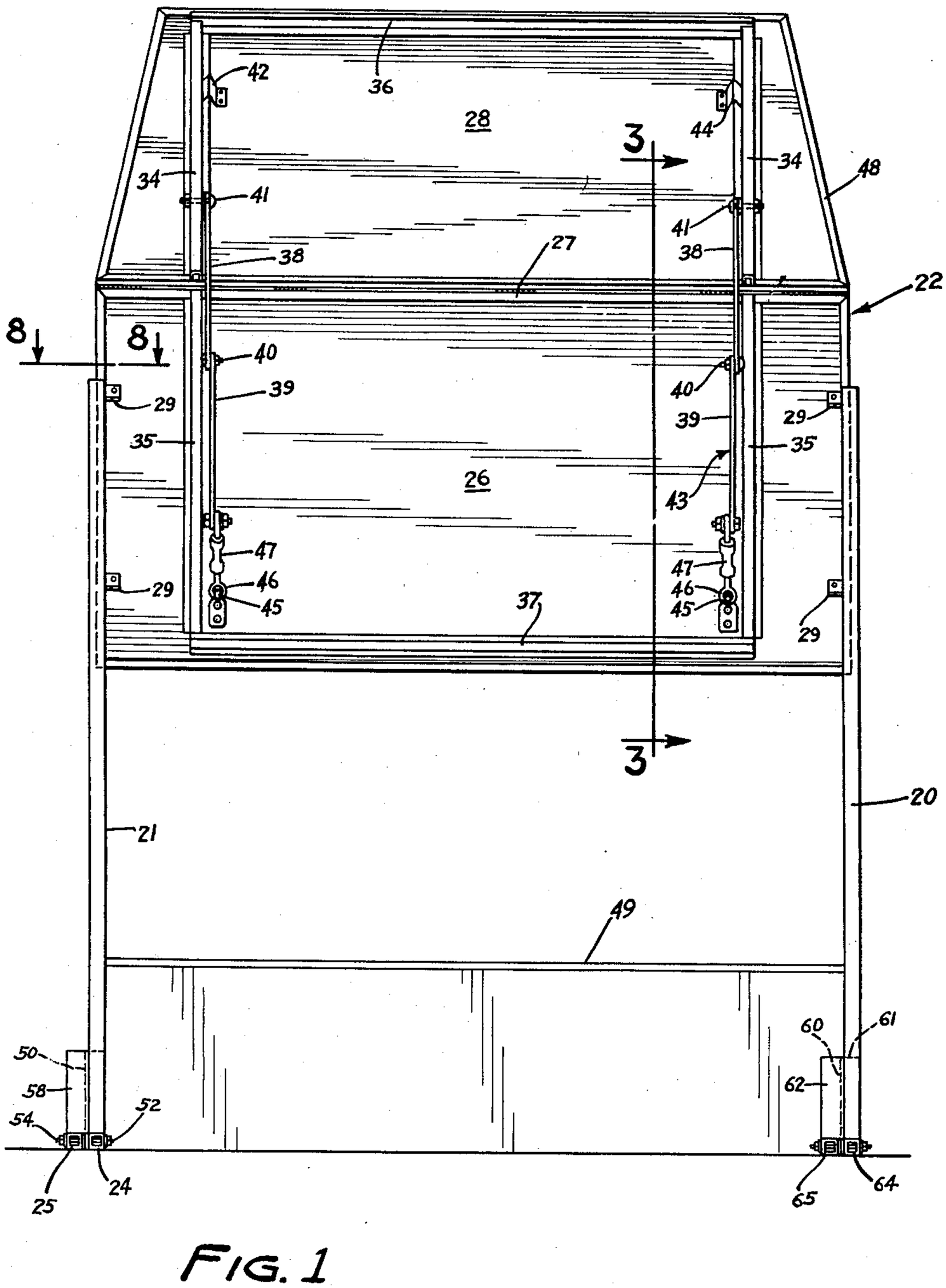

FIG. 1

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6 Sheets-Sheet 2

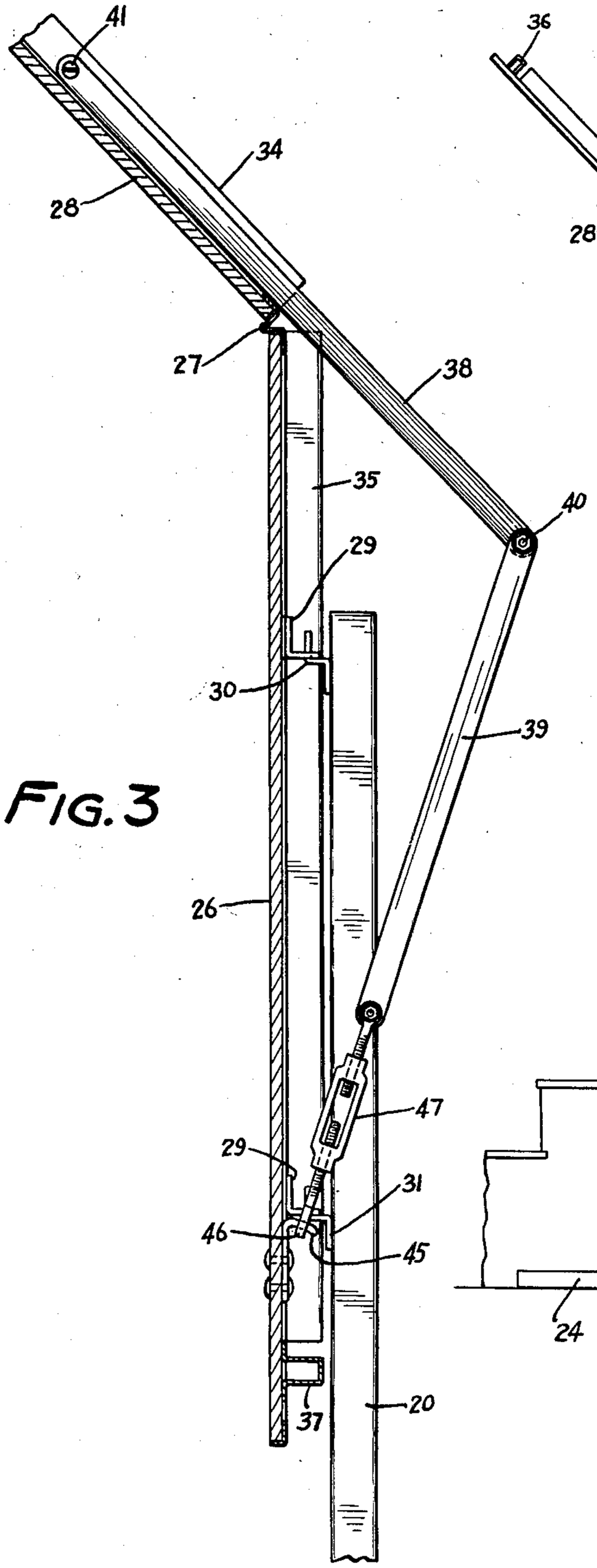

FIG. 3

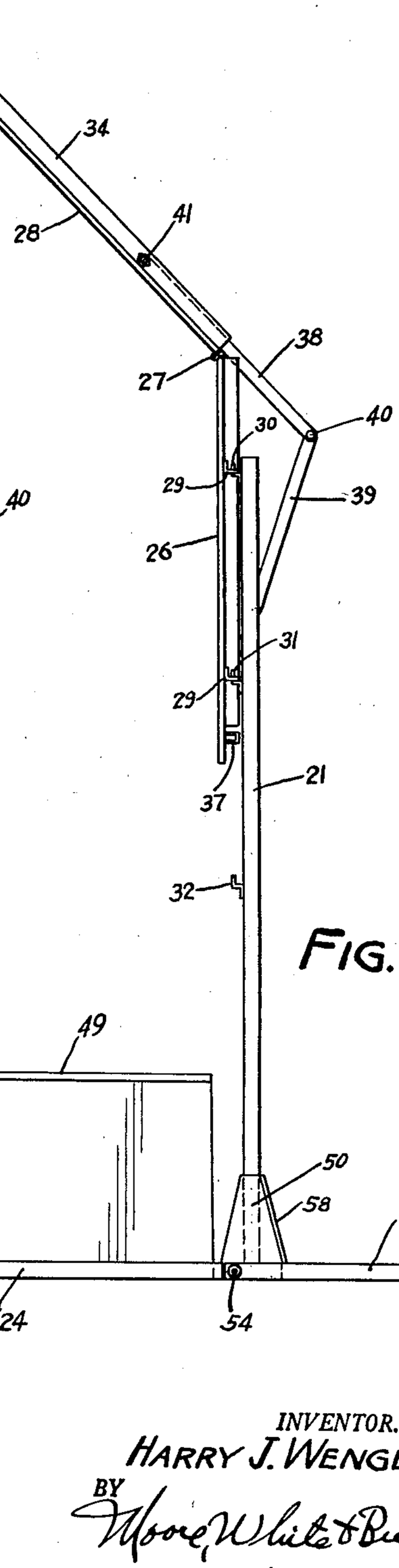

FIG. 2

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6 Sheets-Sheet 3

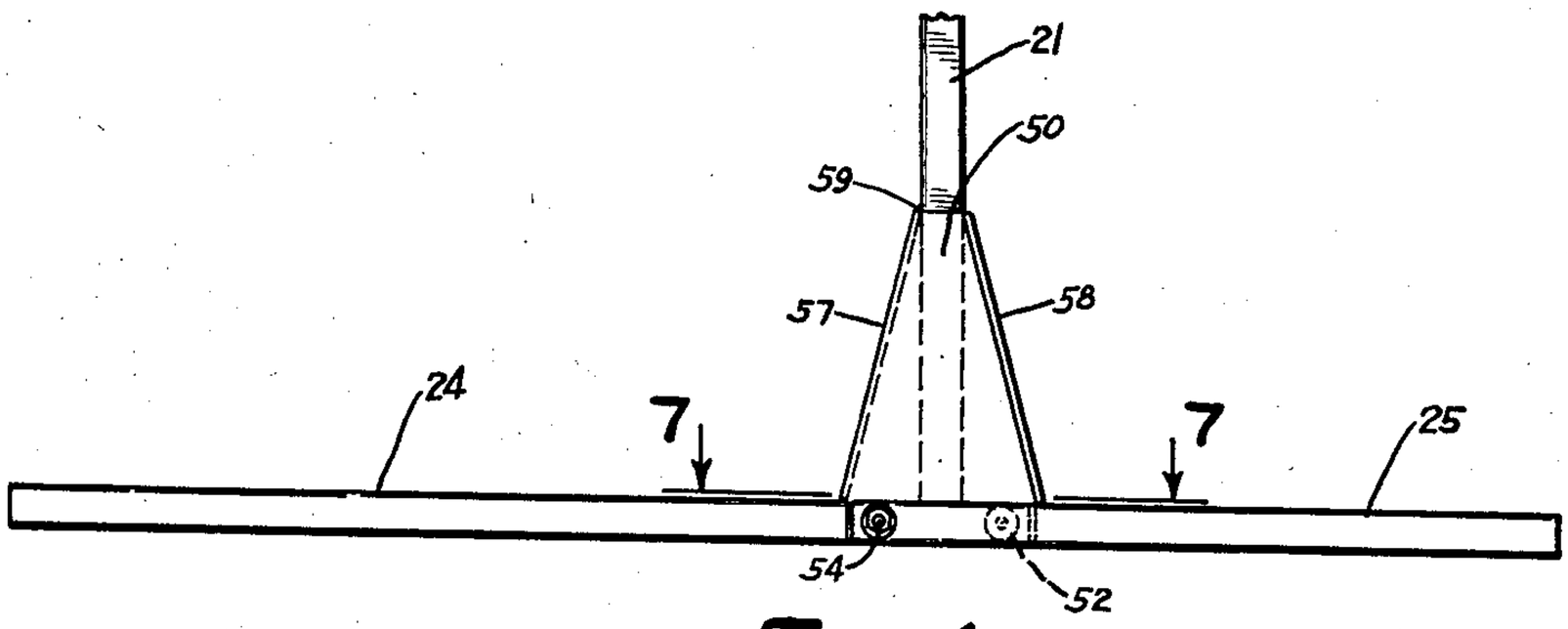

FIG. 4

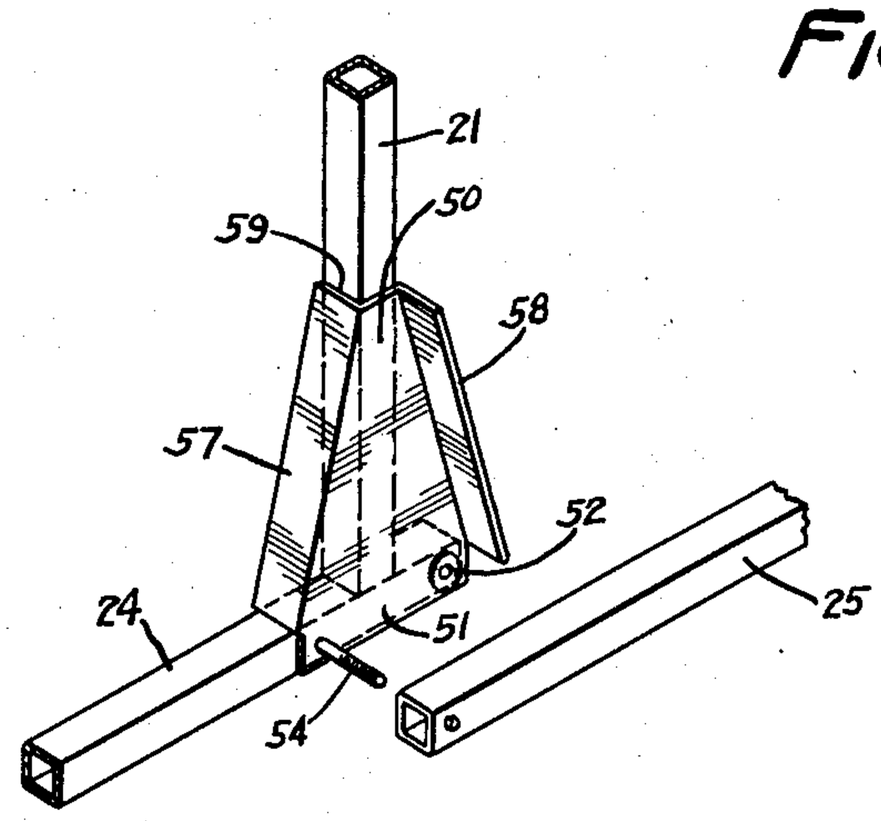

FIG. 6

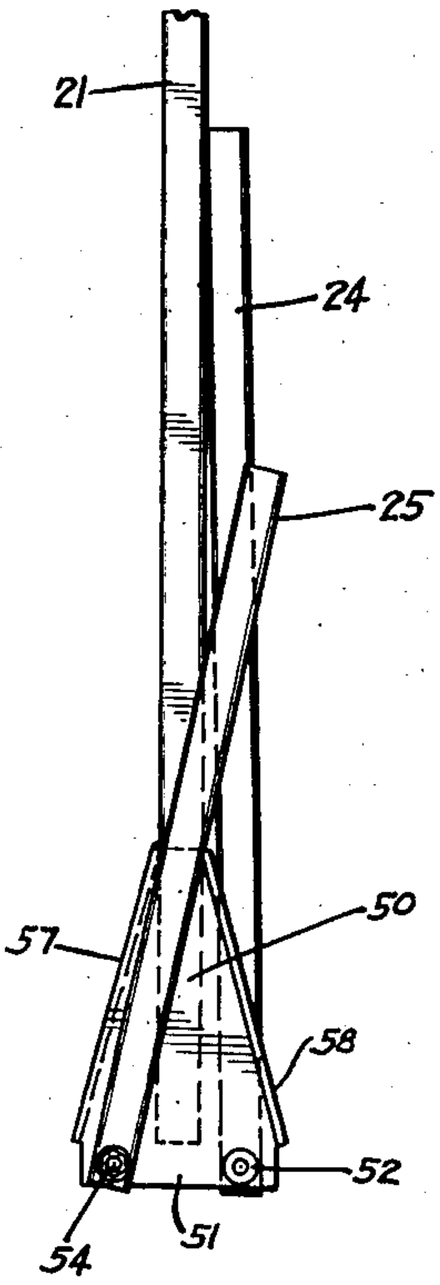

FIG. 5

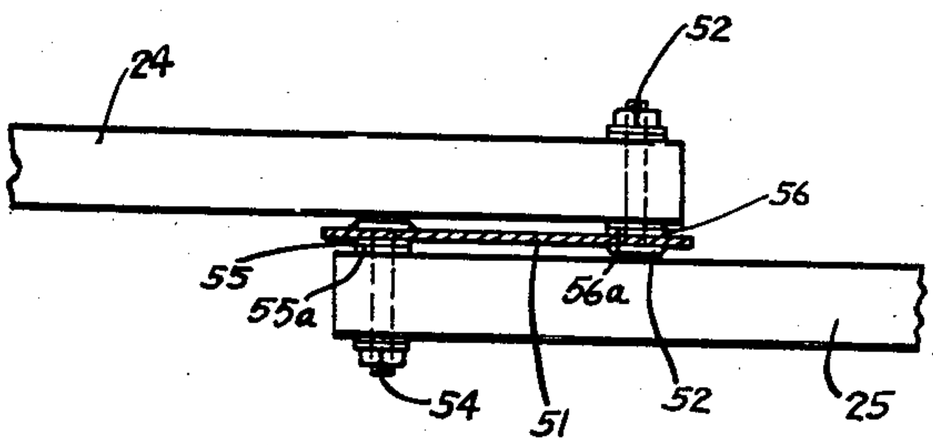

FIG. 7

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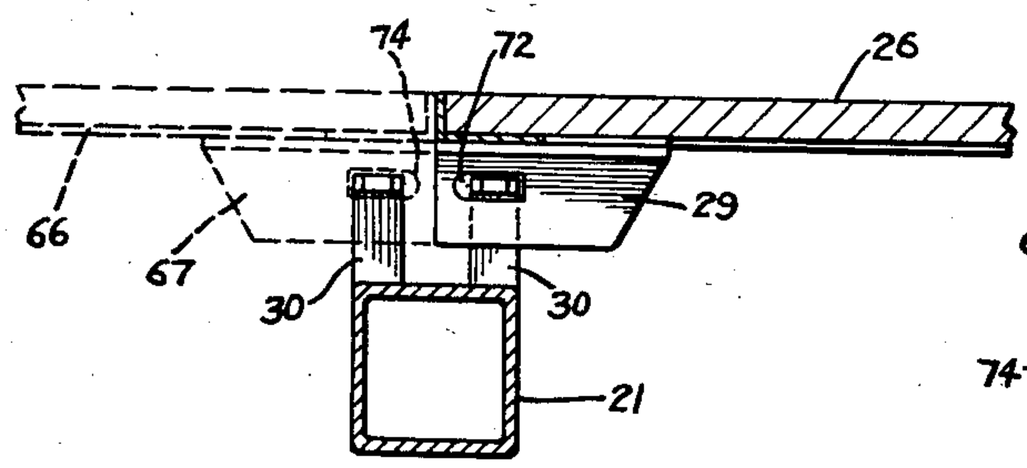

FIG. 8

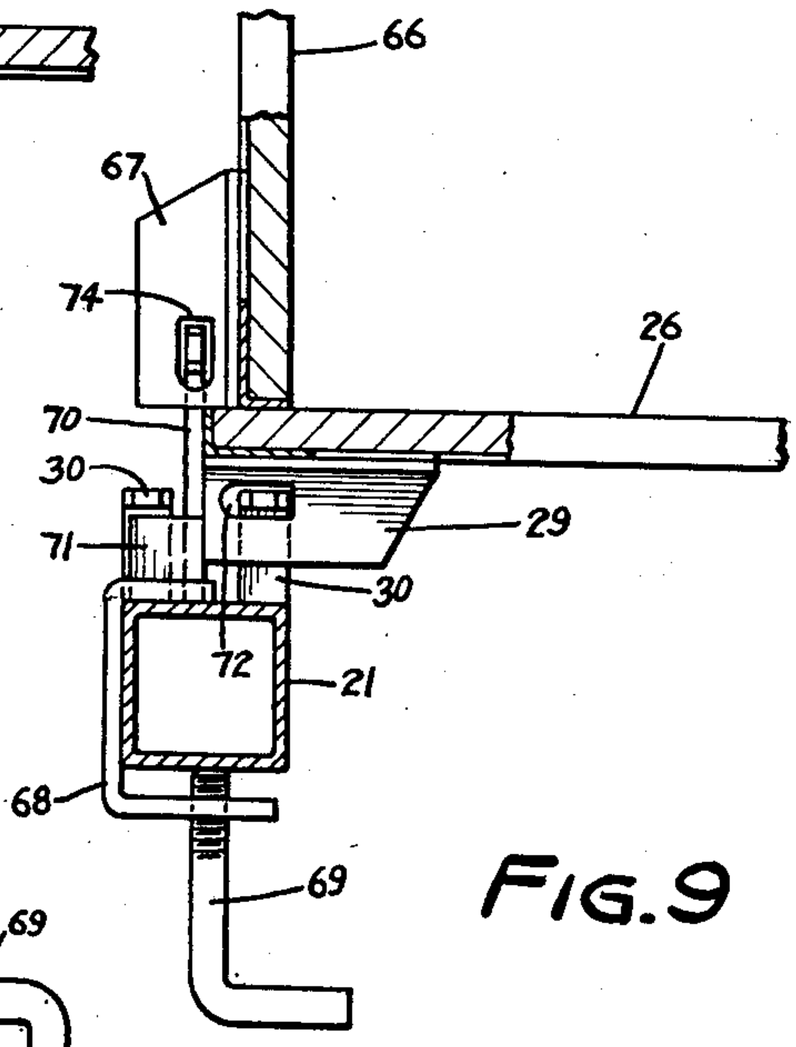

FIG. 9

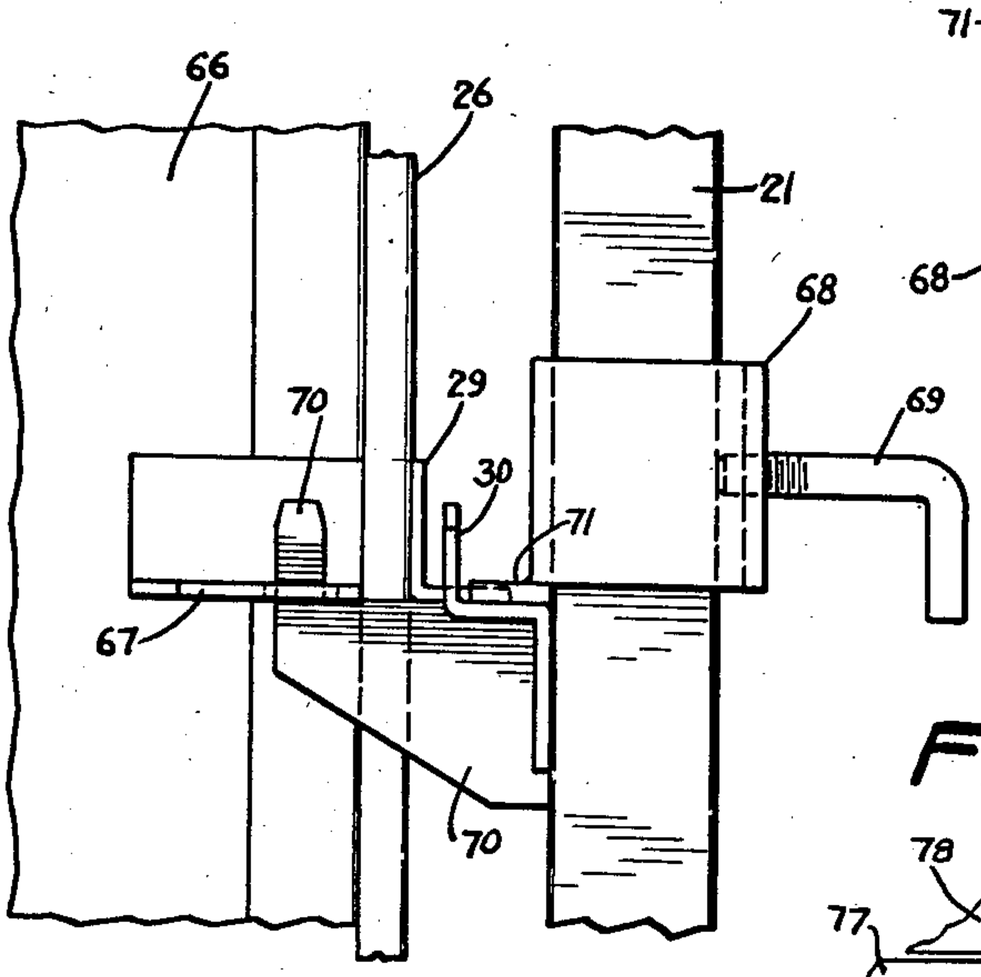

FIG. 10

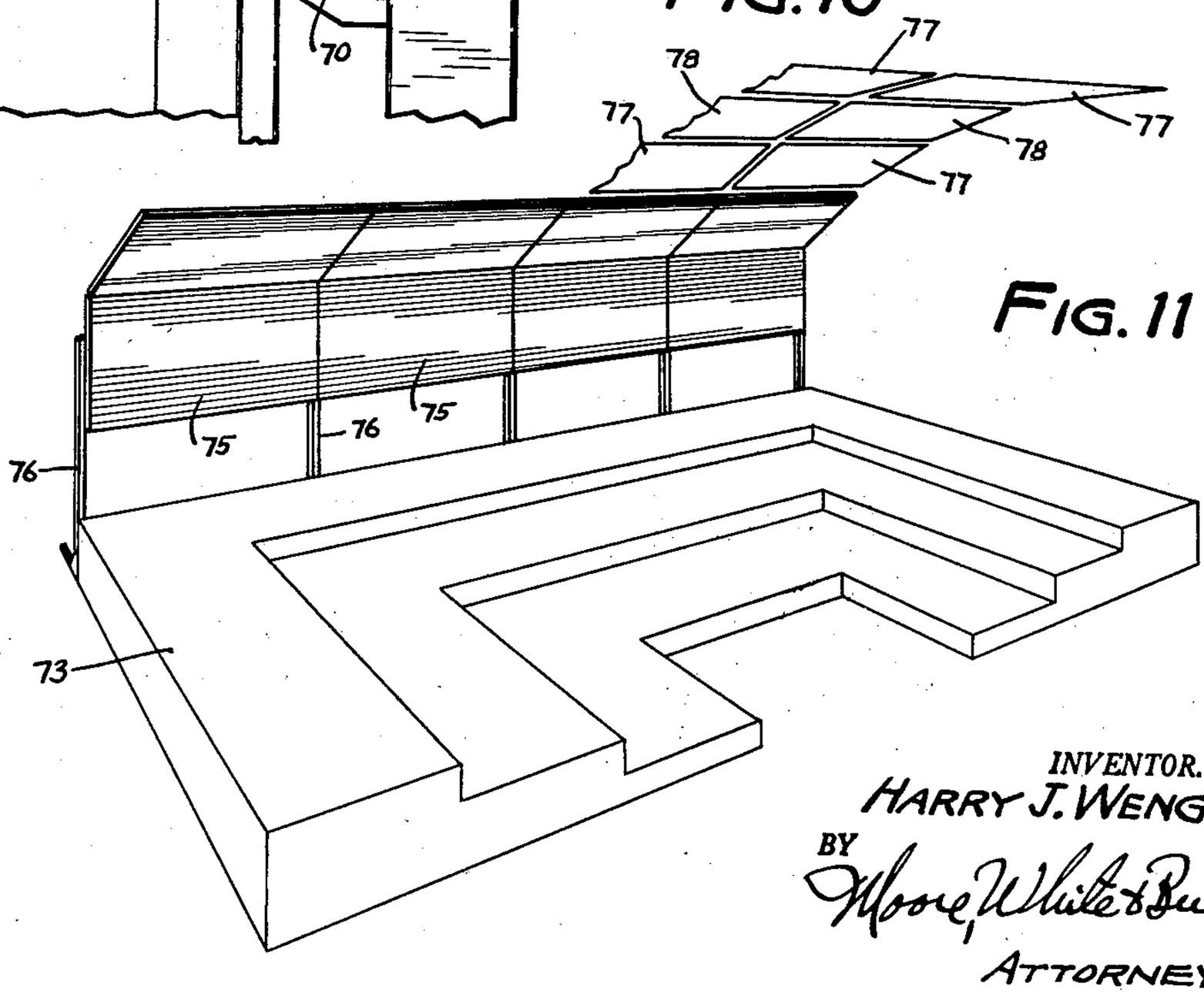

FIG. 11

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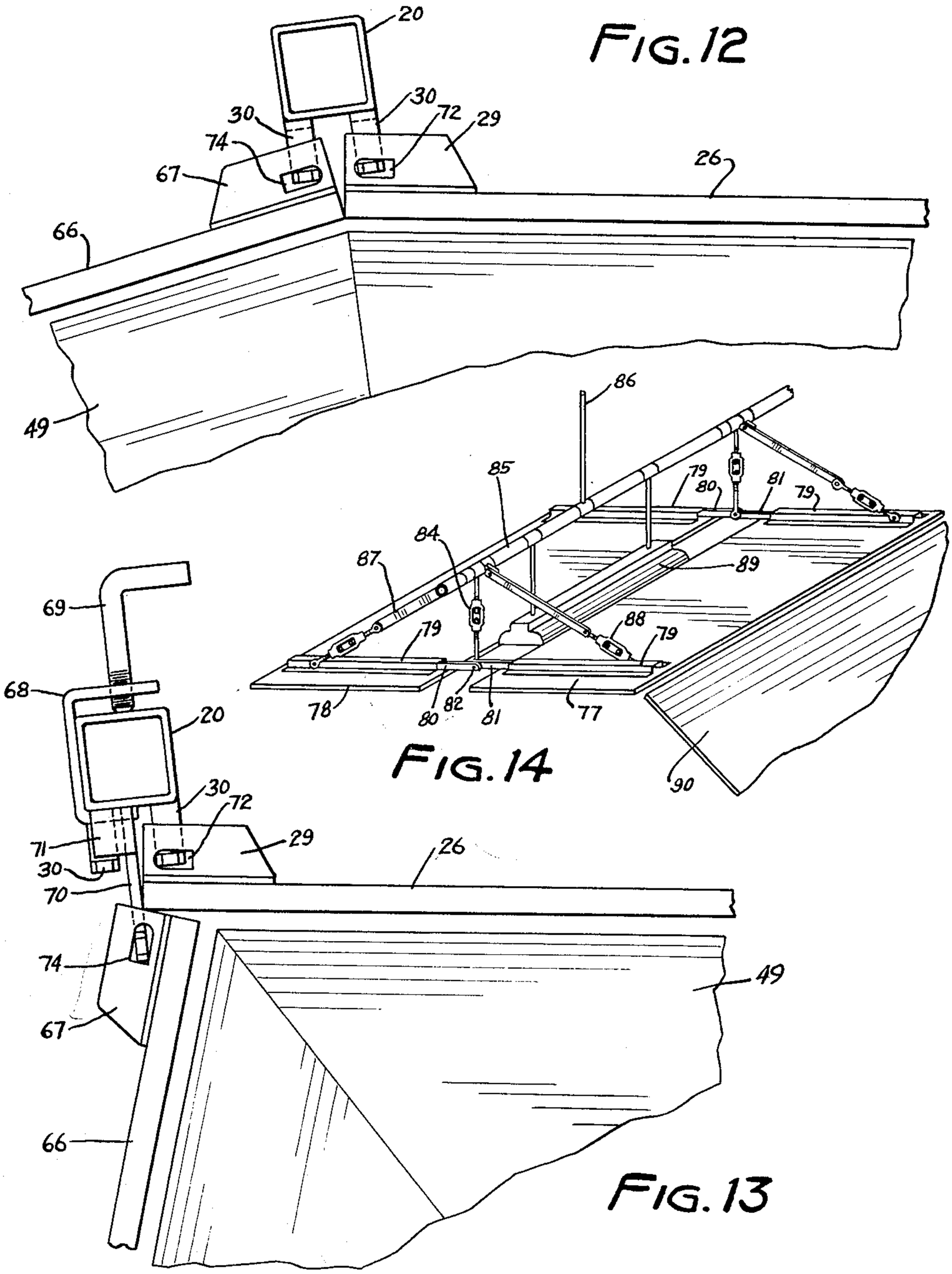

FIG. 12

FIG. 14

FIG. 13

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FIG. 15

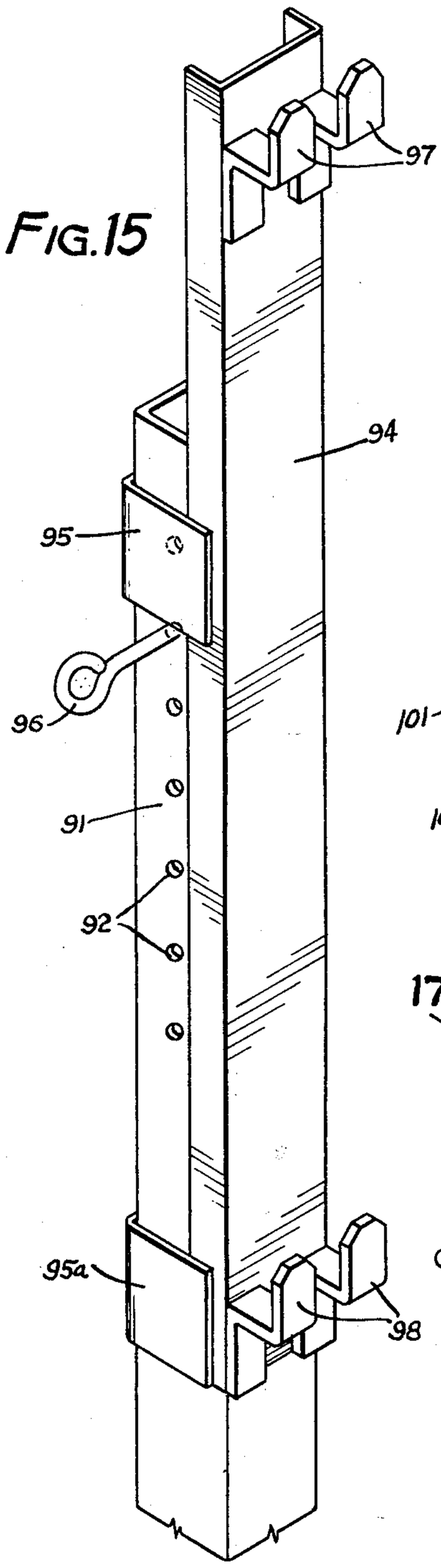


FIG. 16

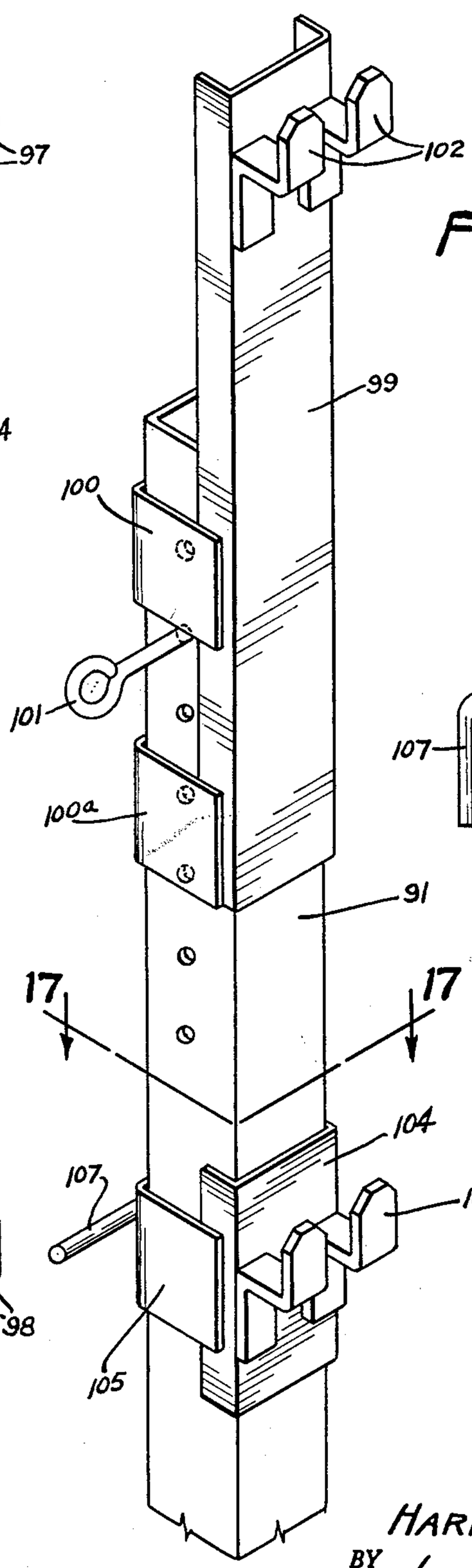
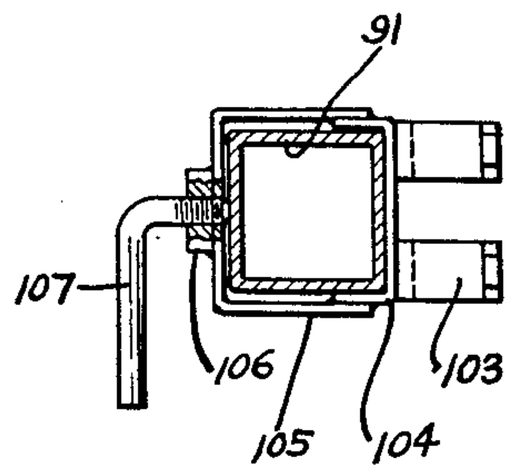


FIG. 17



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3,180,446

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3,180,446
PORTABLE SOUND SHELL

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Filed Nov. 17, 1961, Ser. No. 153,133
12 Claims. (Cl. 181—30)

This invention is a sectional shell for projecting sound from a group of musicians or dramatists out into the area in which the audience observing them is situated. It is novel in that it is supported on a plurality of collapsible standards which are free standing in conjunction with the panels forming the shell to produce a sound directing shell that can be disassembled and stored or transported from place to place easily. It is further novel in comprising structure that adapts it to fit around a formation of risers or steps that support musicians in echelon formation for purposes of observing the conductor and projecting their music out into the audience.

Heretofore, sound projecting structures for orchestras, choruses, dramatic groups and others have been largely built into some other form of structure, such as a stage, music shell, or bandstand. Such structures can be very satisfactory, but the structure in which they are situated is then limited. The limitations resulting from the projecting shell are not important when the structure is to be used principally or solely for purposes of music or dramatic productions wherein this type of projection is desired. With the development of multiple use areas in school buildings, for example, when a single room may serve as both a cafeteria and an auditorium, or as an auditorium and gymnasium and, in occasional cases, a combination of all three; it is inadvisable to have a permanent sound projecting shell erected in any portion of the room. Stated another way, to have a permanent sound projecting shell located in an area simply reduces the versatility of the space. Consequently, in most instances, there is not adequate sound projection for this type of facility when being used for musical productions, etc.

Yet another situation in which a portable projecting shell is highly desirable is that faced by a small musical group which travels about giving performances in various areas and never knowing what kind of facilities they may find available. Oftentimes, even a fairly large chorus, when performing in a large auditorium with an enormous stage, finds that it is difficult for the members of the chorus to hear each other and, therefore, blend their voices adequately to produce the most desirable sound effects. The foregoing and similar problems are those solved by the structure of this invention.

Accordingly, it is a principal object of this invention to provide a novel, portable, sound projecting shell.

It is another object of this invention to provide a sound projecting shell that may be disassembled for storage or transportation purposes.

It is a still further object of this invention to provide a sound projecting shell that is stable when erected.

Still another object of this invention is to provide a sound projecting shell that will adapt itself to a wide variety of arrangements of floor plans.

It is a further object of this invention to provide a choral shell that can be adjusted to project sound from a musical group in a particularly desirable manner depending on circumstances.

Yet another object of this invention is to provide a sound projecting shell that is free standing on its own supports.

Still another object of this invention is to provide a sound projecting shell which lends itself to rapid alteration from one type of use to another type of use.

It is a still further object of this invention to provide

a portable sound shell that is of so-called modular formation in which units may be combined to form a unit of any desired size.

Other and further objects of the invention are those inherent and apparent in the apparatus as described, pictured and claimed.

To the accomplishment of the foregoing and related ends, this invention then comprises the features hereinafter fully described and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principles of the invention may be employed.

The invention will be described with reference to the drawings in which corresponding numerals refer to the same parts and in which:

FIGURE 1 is a rear elevation of a pair of standards and a panel unit; broken lines illustrate hidden parts;

FIGURE 2 is a side elevation of the structure shown in FIGURE 1 with broken lines illustrating hidden parts;

FIGURE 3 is an enlarged, fragmentary, vertical section taken on the line 3—3 of FIGURE 1; hidden parts are shown in broken lines;

FIGURE 4 is an enlarged side elevational fragment of the lower end of the standard drawn to a scale larger than that used in FIGURE 2, but smaller than that used in FIGURE 3; broken lines illustrate hidden parts;

FIGURE 5 is a view of the structure shown in FIGURE 2 in an adjusted position with broken lines illustrating hidden parts;

FIGURE 6 is a fragmentary isometric view of a portion of the structure shown in FIGURE 7 partially exploded to further illustrate its construction;

FIGURE 7 is a fragmentary horizontal section taken on the line 7—7 of FIGURE 4; it is drawn to a scale like that used in FIGURE 3;

FIGURE 8 is a fragmentary horizontal section taken on the line 8—8 of FIGURE 1 with broken lines illustrating a fragment of a second panel portion; it is drawn to a scale larger than that used in FIGURE 3;

FIGURE 9 is a view taken at a similar point to that at which FIGURE 8 is taken but with an accessory supporting bracket being used to support one end of another panel structure at right angles to the panel shown in full lines in FIGURE 8; broken lines illustrate hidden parts; the scale used in that of FIGURE 8;

FIGURE 10 is a side elevational view of the structure shown in FIGURE 9 viewed from the left of the structure shown in FIGURE 9; it is drawn to the same scale as FIGURE 9 and broken lines illustrate hidden parts;

FIGURE 11 is an isometric view drawn to a scale substantially smaller than that of FIGURES 1 and 2, showing a series of panels in place behind a musician's supporting step or riser formation;

FIGURE 12 is a horizontal section through a single stand and two panels showing how they may be turned with respect to the stand in order to follow the outline of a bent or curved musician's supporting stand;

FIGURE 13 is a view of the structure of FIGURE 9 shown in an adjusted position with a fragment of a musician's supporting stand shown in relation thereto;

FIGURE 14 is an isometric view of an overhead sound deflecting panel used in conjunction with the units shown in FIGURES 1–13; it is drawn to a scale between that used in FIGURES 1 and 11;

FIGURE 15 is a fragmentary, isometric view of a modified form of standard and hook carrying structure; broken lines illustrate hidden parts and the scale used is that of FIGURES 8, 9 and 10;

FIGURE 16 is a view similar to FIGURE 15 but of

a still further modified form of structure with broken lines illustrating hidden parts; FIGURE 16 is drawn to the same scale as FIGURE 15; and

FIGURE 17 is a sectional view of the structure shown in FIGURE 16, taken on the lines 17—17 of FIGURE 16; broken lines illustrate hidden parts.

Referring to FIGURE 1, the basic element of the shell comprises a pair of vertical members such as standards 20 and 21 which support the sound deflecting panels generally designated 22. The standards 20 and 21 are given stability in a vertical plane extending forward and rearward through the standard by means of folding feet 24 and 25, as shown in FIGURE 2. It will be noted that the leg 24 is somewhat longer than leg 25. The reason for this is that the majority of the stress placed on the stand is in a forward direction as a result of the overhange of the panels.

The panels consist basically of a suitable sound deflecting material such as plywood or the like, formed into a vertical panel 26 which is suitably hinged as by the piano hinge 27 to an upper panel 28 of the same material as panel 26. As seen in FIGURE 3, panel 26 is provided with the brackets 29 which fit over the hooks 30 and 31 that are rigidly secured to the standard 21. A third hook 32 in FIGURE 2 may be used with hook 31 to support the sound deflecting panels at a lower level when that is desirable.

Both panel 28 and panel 26 are provided with stiffening channel members such as those designated 34 for panel 28 and 35 for panel 26. If desired, longitudinal stiffeners such as the ones designated 36 and 37 for the panels 28 and 26 respectively may also be employed. When the panels 26 and 28 are stored, the supporting links 38 and 39 are pivoted at their juncture 40 to lie parallel to each other. Both of the units are then pivoted at their mounting pivot point 41 so that they together engage and are held by the spring clip 42 in FIGURE 1. A second supporting link assembly 43 may be similarly folded and held by clip 44. When the supporting links 38–39 are not holding panel 26 at an angle with respect to panel 28, the two panels are hinged face-to-face by hinge 27. This is the condition in which the panels would be when taken from a storage place.

With the standards erected, the panel brackets 29 are engaged on the hooks 30–31 to interconnect the panels and the standards to provide stability to the entire structure. Supporting links 38–39 are then unsnapped from the spring clips and arranged as shown in FIGURES 2 and 3. A hook, such as the one designated 45 in FIGURE 3, engages an eye 46 secured to link 39. It is also desirable to have an adjusting means such as turnbuckle 47 included as part of the link 39 so that the angle of panel 28 in relation to panel 26 may be altered to adapt the unit to the circumstances for which it is to be used. Also, such as adjustment as turnbuckle 47 is a convenient means for aligning the leading edges of all of the panels 28 used in a group. Link 38 supports the panel 28 by bearing on the upper edge of panel 26 at the hinge 27. The leverage of this arrangement is such that a relatively small adjustment of turnbuckle 47 may alter the angle of panel 28 with relation to panel 26 substantially.

Links 38, 39 and link assembly 43 are unclipped from their securing clips 42 and 44 after the unit is hung on the stands 20–21. It is quite possible to reach the free end of link 39 and the corresponding link of assembly 43 as they hang down after the unit has been mounted on the stands. These units may be erected completely by people working from the floor surface which the feet 24–25 engage and erection requires no step ladders or the like to allow workers to reach any of the parts as the unit is being readied for use. The sound deflecting panels may be provided with edging as shown at 48 in order to protect them against damage when being moved to and from the stands or stored. A fragment of a musician supporting stand is shown at 49 in FIGURES 1 and 2 to illustrate

the position of the supporting stand in relation to the shell units.

In FIGURE 4, the standard 21 is shown as provided at its base with the generally triangular web 50. This web member 50 is suitably secured to standard 21 as by welding or the like. Web 50 extends below the bottom of the standard 21 as may be seen at 51 in FIGURE 6. This extending portion 51 of web 50 supports the two flat-headed bolts 52 and 54 which in turn pivotally support at the web the ends of the two foot members 24 and 25. Suitable washers as shown at 55, some of which are fiber, in FIGURE 7, provide clearance between foot member 25 and the flat head of bolt 52 that supports foot 24. Similar washers at 56 provide clearance between the head of bolt 54 with respect to the foot 24. The fiber washers 55*a*, 56*a* (FIGURE 7) on bolts 52–54 hold feet 24–25 yieldingly as shown in FIGURE 5.

Web member 50 has also two flanges bent at right angles to the plane of web 50. These flanges designated 57 and 58 are terminated at a point that is even with the lower end of standard 21. For this reason, they provide a portion of the supporting stops for the legs 24 and 25 respectively when they are placed in operative position as shown in FIGURE 4. On the other hand, because the legs 25 and 24 are pivoted to the lower extending portion of web member 50, they can be swung up into the substantially vertical position shown in FIGURE 5 by swinging them away from the web flanges 57 and 58. Thus folded, the stands are easily taken from place to place or stored when not in use. It will be noted also, in FIGURE 6 particularly, that web 57 aligns with the standard 21. It may be welded as at point 59, therefore, and provide considerable additional support for leg 24 as the weight of angularly extending panel 28 bears on the standard. It will be noticed that the bottom end of standard 21 also impinges on a portion of leg 24 beyond the hinge bolt 52 so that this leg is particularly securely held against pivoting past a given point when moved into operative position. Leg 25 is kept from pivoting beyond the operative position shown in FIGURE 4 by the lower end of flange 58. As relatively little pressure is applied in this direction, this flange alone is very adequate to hold leg 25 from pivoting too far. This foot structure described in detail in connection with standard 21 is duplicated with respect to standard 20 wherein the web member 60 has the flanges 61 and 62 which engage and serve as stops for the feet members 64 and 65. All of the standards fold in the same manner as that described for standard 21 in relation to FIGURES 4, 5, 6 and 7.

In FIGURE 8, standard 21 is shown in horizontal section close to the hooks 30 so that it may be seen that there are two of the hooks at each elevation on the stand. The bracket 29 of panel 26 is shown engaging one of the hooks 30 and in broken lines is represented a second panel 66 which has a bracket thereon 67 that engages the other of the hooks when one of standards is used at the junction point of two panels. Thus, to erect a series of panels into a shell, one need have only a number of stands equal to the number of panels plus one.

Sometimes it is desirable to have a second panel such as the one 66 in FIGURE 9 extend at right angles to the panel 26 supported by standard 21 as shown in FIGURE 8. In order to accomplish this purpose, the special bracket generally designated 68 may be seen supported in part by one of the hooks 30 and in part by a U-shaped or C-member that embraces post 21 and incorporates a screw thread clamping member 69. The C-member carries a hook 70 that extends far enough past the panel 26 to allow the bracket 67 of unit 66 to be engaged thereon. Note also that bracket 68 has a small plate 71 which fills the space between standard 21 and the hook 30 with respect to which the bracket 68 is being employed. In this manner, the hook 30 can provide a fixed structure to support bracket 68 and leg 70 which extend down between the two hooks 30 as may be seen in FIGURE 9. The load

supported by bracket **68** is carried mainly by hook **30**, and the clamping screw **69** merely assures that the entire bracket does not become disengaged from the upright **21**. In FIGURES 12 and 13, it may be seen that the holes **72** and **74** in the brackets **29** and **67** respectively are substantially larger than the hooks **30** or the hook **70** of bracket **68**. As they are larger than the hooks of the stand and bracket, the panels **26** and **66** may be turned slightly with respect to each other and need not be in an exactly straight line as shown in FIGURE 8 or at precisely right angles as shown in FIGURE 9. For this reason, the units may be accommodated to almost any configuration of musician support or risers, as they are generally known in the trade.

FIGURE 11 shows a series of panels **75** supported between the stands **76**. These stands **76** are identical to the ones shown and described in more detail in relation to FIGURES 1–7. The panels **75** are similar to the panels **26–28** in FIGURES 1, 2 and 3. A difference between them is that the upper panels in FIGURE 11 have straight sides instead of being tapered as are the sides of panels **28**. Units such as those shown at **75** may be used with a musician supporting stand such as the one **73** where it is desired merely to have a sound projecting panel across the straight back of such a supporting stand. On the other hand, units such as those shown in FIGURES 1, 2 and 3 may be used around devices forming a curved or polygonal shape other than the rectangle shown in FIGURE 11. Also, units similar to that shown in FIGURES 1, 2 and 3 may be made with flaring top panels that will complement units such as those shown in FIGURES 1, 2 and 3 to form straight elements where that is desired occasionally, but where generally the tapered units as shown in FIGURES 1, 2 and 3 are more useful. Fragments of overhead sound reflecting panels **77** and **78** are shown in FIGURE 11 to illustrate how the basic shell and overhead panels are used together. The precise structure of panels **77** and **78** is described below in connection with FIGURE 14.

If it were desired to extend sound reflecting panels along the sides of support platform **73**, brackets such as those shown in FIGURES 9, 10 and 13 would be employed to support the end of the panel adjacent to the panel **75** in each instance. As the brackets must accommodate themselves to the opposite sides of the rows of panels **75**, obviously the brackets **68** must be made in the right and left hand units.

In FIGURE 14 is shown an overhead sound reflecting unit which is used in conjunction with the panels illustrated up to this point. This unit may be supported either by regular stage fly rigging structure or special rigging provided specially for that purpose. The overhead unit consists basically of two sound deflecting panels **77** and **78** that are supported as spaced planar members to facilitate the combination of adequate lighting with proper sound projection as described below. Each panel may be provided with stiffening channel members, which members are all fundamentally alike and therefore all designated **79**. Bar support members that fit inside the channel members are provided as shown at **80** for panel **78** and **81** for panel **77**. The units are pivoted as at **82** and this pivot joint is supported by an adjustable length link **84**. Similar structure may be seen employed at the other end of the device. The adjustable length link **84** extends up to the master support rod **85** which is in turn supported by the regular stage rigging if it is used in an area provided with such rigging. Special rigging as shown at **86** may be provided if the unit is used in an area that is not provided with rigging such as that generally used for lifting staging elements overhead. Adjustable length links such as those shown at **87** for panel **78** and **88** for panel **77** make it possible to tip the ends of the panel up and down with respect to the center support **84**. Center support **84** may also be lengthened and shortened to produce a similar effect. The combination of adjustments between adjustable length supports **84**, **87** and **88** provide substantial latitude of adjustment of the panel **77** with respect to panel **78** from an arrangement in which they are in the same plane with each other as shown in FIGURE 14 or hinged either direction from hinge point **82**. Panels may be spaced apart as shown clearly in FIGURE 14 and lighting such as fluorescent lighting fixture **89** extended between the panels. It has been discovered that accurate, effective and proper sound projection is obtained if up to 75% of the overhead space over a musical group is covered. For this reason, the opening between the panels **77** and **78** does not disadvantageously affect its sound deflecting qualities to any serious extent. At **90** is seen a fragment of the upper panel of one of the sound deflecting structures disclosed in FIGURES 1–13 with which the overhead unit shown in FIGURE 14 is used.

If the rigging that supports these overhead units is inadequate to permit withdrawing the unit far enough to get it entirely out of the way, it may be lowered to a point where it can be easily reached and removed from the supporting pipe. The unit then will fold as by hinging at point **82** into a space only slightly greater than the two panels themselves would occupy if placed side-by-side with the flat surfaces thereof together. In most instances, however, the unit will be stored by simply withdrawing it upward in whatever area it is used until it is not likely to interfere with any other type of activity that is carried on.

In FIGURE 15, the standard **91** is similar to the standards **20** and **21** of the form of device shown in FIGURE 1 except that there is a series of openings **92** extending laterally through the standard **91**. A channel member **94**, which is slightly longer than the distance between the hooks **30** and **31**, as shown in FIGURES 2 and 3, slidably embraces one side of standard **91**. A pair of bands **95** and **95A** are secured to channel member **94** so as to form a ring-like arrangement at two points on channel **94** that embrace the standard **91**. This entire assembly can slide up and down channel **91** freely unless some means such as the pin **96** is extended through one of the holes **92** in order to limit downward movement of ring **95**. Hooks **97** and **98** are comparable to the hooks **30** and **31** respectively and are secured rigidly to the channel member **94**.

It will be noted that a portion of channel member **94** extends above the ring member **95** so that the panels supported by the channel may actually extend substantially above the end of standard **91**. For this reason, the structure shown in FIGURE 15 will provide an additional eight inches of elevation for the sound deflecting panels without lengthening the standard **91**. This is useful, for example, in situations where a large standing chorus is arranged on stair steps and the number of stair steps provided makes it advisable to raise the slanting portions **28** of the sound deflecting panels sufficiently to accommodate one additional higher tier of singers. Band **95A** merely stabilizes the lower end of the unit. Band **95** carries substantially all of the weight of the panels supported by the standards.

This structure has several advantages over that illustrated in FIGURES 1, 2 and 3, the principal one being that a much greater variety of adjustments of the height of the deflecting panels may be obtained quickly and easily. It has the additional advantage that damage to the hooks does not necessitate sending the entire standard into the factory for repair. Only the channel **94** and its accompanying elements need be in the hands of the workman in order to repair the hooks **97** and **98**. Not only is the structure illustrated in FIGURE 15 more flexible than the structure shown in FIGURES 1, 2 and 3, therefore, but it also minimizes problems incident to maintenance and repair. These advantages far outweigh the single disadvantage of requiring slightly more material to construct the unit in the form shown in FIGURE 15 than that illustrated in FIGURES 1, 2 and 3, for example.

The standard shown in FIGURE 16 is identical to the one used in FIGURE 15 and therefore is also identified as

91 and having the holes 92 therein. A short channel 99 slidably embraces standard 91 in the same manner as channel 94 does. A pair of straps 100 and 100A are secured to the edges of channel 99 and encircle the standard 91 to provide a sliding attachment between these elements which nevertheless holds the channel 99 in close association to the standard 91 but permits vertical sliding motion. A pin 101, extending through an appropriate one of the holes 92, establishes the position of channel 99 with respect to the standard 91. As the pin 96 extends directly under the strap 95, so the pin 101 supports the channel 99 by having strap 100 rest directly on it. Positioning channel 99, therefore, establishes the location of the upper hooks 102 for supporting any one of the sound deflecting panels.

In order to prevent the lower end of the panels from swinging, a stabilizing pair of hooks 103 are secured to a short channel segment 104. A strap 105 embraces the standard 91 and restrains the motion of channel 104 except for vertical sliding on standard 91. Any suitable friction means such as the nut 106 and the handled set screw 107, which engages the standard 91 when tightened, will fix the location of channel 104 with respect to the standard 91 (FIGURE 17).

While the structure shown in FIGURE 15 has many advantages over the structure shown in FIGURES 1, 2 and 3, the structure shown in FIGURE 16 is still more advantageous. Unless the hooks 97 and 98, as well as the brackets on the sound deflecting panels which engage them, are spaced with substantially greater precision than is economically feasible, one or the other of the sets of hooks 97–98 will be supporting the majority of the weight of the panels. For the sake of stability, errors generally made in favor of having the hooks 97–98 spread slightly farther apart than are the brackets to engage them on the panels. This means that most of the weight of the panels will be supported in a depending fashion from the hooks 97 with the hooks 98 merely holding the bottom side of the panels in close to the standard and thereby stabilizing them. In the case of the structure shown in FIGURE 16, however, the hooks may actually distribute the weight of the panels between them more precisely.

The manner of using the structure in FIGURE 15 is precisely like that of using the structure shown in FIGURES 1, 2 and 3. In the case of the structure shown in FIGURE 16, however, the upper bracket is first located to determine the actual elevation at which the sound deflecting panels will be supported finally. The panels are then hung on the hooks 102. With hooks 102 carrying all of the weight of the panels, the set screw 107 is loosened and channel 104 is vertically slid up the post 91 until such time as the hooks 103 actually engage the brackets at the bottom of the sound deflecting panels. By placing a slight upward force on these hooks just before the set screw 107 is tightened, at least a portion of the total weight of the panels may be carried by hooks 103. In any event, these hooks thus supported are perfectly adequate to stabilize the lower end of the panels from swinging outward away from the standard.

The structure of FIGURE 16 has substantially all of the advantages of the structure in FIGURE 15, only carried one step further. If one set of hooks in FIGURE 15 is damaged, the entire structure must be taken for repair or returned to the factory for same. In FIGURE 16, if either set of hooks is damaged, only that portion of the hook structure need be carried to a repair place or shipped to the factory for repair. As the hooks which support the panels are one of the more vulnerable portions of the structure and subject to damage by mishandling, carelessness or accident, ease of repair is important to commercial success.

It is apparent that many modifications and variations of this invention as hereinbefore set forth may be made without departing from the spirit and scope thereof. The specific embodiments described are given by way of example only and the invention is limited only by the terms of the appended claims.

What is claimed is:

1. A portable sound deflecting unit composed of sound deflecting panels and standards to support said panels; each of said standards comprising, a rigid vertical member, vertically spaced panel securing means mounted on said rigid vertical member, a web means secured to and extending beyond one end of said rigid vertical member at one side thereof, a foot hinged to said web on the same side thereof as said rigid vertical member but below and outside of a downward projection of said rigid vertical member, the lower end of said rigid vertical member serving to limit hinging movement of said foot in one direction when said foot and rigid vertical member are approximately at right angles to each other, a second foot hinged to said web on the opposite side thereof from said rigid vertical member and the opposite end from said first mentioned foot, and stop means secured to said web for limiting hinging movement of said second foot when it is approximately parallel to said first foot.

2. The portable sound deflecting unit of claim 1 in which there are friction means including fiber washers between said web and said feet to yieldingly hold said feet in whatever position they are placed relative to said rigid vertical portion.

3. A portable sound deflecting shell comprising at least three standards independently stabilized in one plane only, sound deflecting panels having brackets thereon with openings therein, hooks on said standards, said bracket openings engaging said hooks whereby said standards and panels are stabilized in a second plane and free standing, the hooks on said standards being divided and thereby adapted to engage brackets on adjacent ends of two different panels to support them both, said panels each comprising two planar portions, one of which carries said brackets and the other of which is hinged to said first one, links secured to said other planar portion, link hooks on said one planar portion, said links having eyes thereon for engaging said link hooks to determine the angular relationship between said planar portions when they are secured to said standards; said other planar portion is of greater length at a first side thereof hinged to said one planar portion than at the side thereof opposite said first side.

4. The portable sound deflecting shell of claim 3 in which said links are variable in length.

5. The portable sound deflecting shell of claim 4 in which said links are pivotally connected to said other planar portion, and clips on said other planar portion to hold said links when not in use.

6. A portable sound deflecting shell comprising a plurality of standards, each of which includes a vertical member, web portions having truncated triangular main body portions secured to said vertical portions and extending below the end thereof, feet hinged to portions of said web that extend below the lower end of said vertical portions and at points that lie outside their vertical downward projections, flanges formed on said web members and extending at right angles to the main body portions of said web members, said flanges extending from edges of said main body portions of said web members into the paths of hinging movement of said feet and at the end of said web opposite to that to which the leg whose path of movement the flanges lies in is hinged, split hooks secured to said vertical standard spaced substantially above said web member, a plurality of sound deflecting panels, brackets on said panels adapted to engage one-half of a split hook, the brackets on said panels so constructed and arranged that the brackets on one end of one panel engage two vertically spaced hook halves on a single standard, said hooks and bracket panels arranged to have said brackets extend at an angle in excess of 45° to the path of movement of the feet on said vertical standard portions, said panels each comprising two planar surfaces hinged together

above the highest bracket thereon, and link means secured to said upper panel and securable to said lower panel to determine the angle at which said upper panel extends with relation to said lower panel portion, the number of standards being equal to the number of panels plus one.

7. The portable sound deflecting shell of claim 6 in which said link means are variable in length.

8. A portable sound deflecting unit comprising at least two standards, feet movably secured to said standards, said feet normally being disposed in a first position extending frontward and backward from said standards to provide stability therefor in one plane, said feet being movable relative to said standards between said first position and an inoperative position, brace means for retaining said feet in said first position, sound deflecting panels having brackets thereon with openings therein, hooks on said standards, said bracket openings engaging said hooks whereby said standards and panels are secured together and stabilized in a direction different from that provided by the standards alone; whereby said standards and panels when engaged provide a free standing sound deflecting panel, in which each of said sound deflecting panels comprises a pair of planar portions, said planar portions are hinged together, and said brackets are secured to one only of said planar portions, links secured to the other of said planar portions, cooperative hook and eye means on said links and said one planar portion for determining the angular relation between said planar portions when they are secured to said standards.

9. A portable sound deflecting unit comprising at least two standards, feet movably secured to said standards, said feet normally being disposed in a first position extending frontward and backward from said standards to provide stability therefor in one plane, said feet being movable relative to said standards between said first position and an inoperative position, brace means for retaining said feet in said first position, sound deflecting panels having brackets thereon with openings therein, hooks on said standards, said bracket openings engaging said hooks whereby said standards and panels are secured together and stabilized in a direction different from that provided by the standards alone; whereby said standards and panels when engaged provide a free standing sound deflecting panel, said hooks on said standards are secured to channel members slidably engaging said standards, bands secured to said channel members and embracing said standards to limit movement of said channel members with respect to said standards to vertical sliding, spaced openings in said standards and pin means adapted to extend through said openings and engage one of said bands secured to said channel members to limit downward vertical sliding motion of said channel members with respect to said standards.

10. The portable sound deflecting unit of claim 9 in which the top one of said bands encircling the standard is spaced downward a substantial distance from the top hooks on said channel member.

11. A portable sound deflecting unit comprising at least

two standards, feet movably secured to said standards, said feet normally being disposed in a first position extending frontward and backward from said standards to provide stability therefor in one plane, said feet being movable relative to said standards between said first position and an inoperative position, brace means for retaining said feet in said first position, sound deflecting panels having brackets thereon with openings therein, hooks on said standards, said bracket openings engaging said hooks whereby said standards and panels are secured together and stabilized in a direction different from that provided by the standards alone; whereby said standards and panels when engaged provide a free standing sound deflecting panel, some of said hooks are secured to a channel member slidably engaging one side of said standards, a pair of spaced bands embracing said standards and secured to the edges of said channel member to limit movement of said channel member with respect to said standards to vertical sliding movement, a plurality of vertically spaced openings extending transversely through said standards, means extending through said openings and engaging at least one of the bands embracing said standards limiting downward movement of said channel member with respect to said standards, a second channel member embracing said standards, a band encircling said standards and secured to said channel member limiting movement of said second channel member to vertical sliding movement on said standards, hooks secured to said second channel member and set screw means threadably engaging said band and adapted to frictionally engage and disengage said standards selectively.

12. The portable sound deflecting unit of claim 11 in which the upper of the bands secured to said channel member supported by said means extending through the openings in said standard is spaced longitudinally a substantial distance from the hooks secured to said channel member.

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