Oct. 8, 1968 H. D. WOLFE 3,404,494

THEATRE AND STAGE CONSTRUCTION

Filed April 15, 1966 2 Sheets-Sheet 1

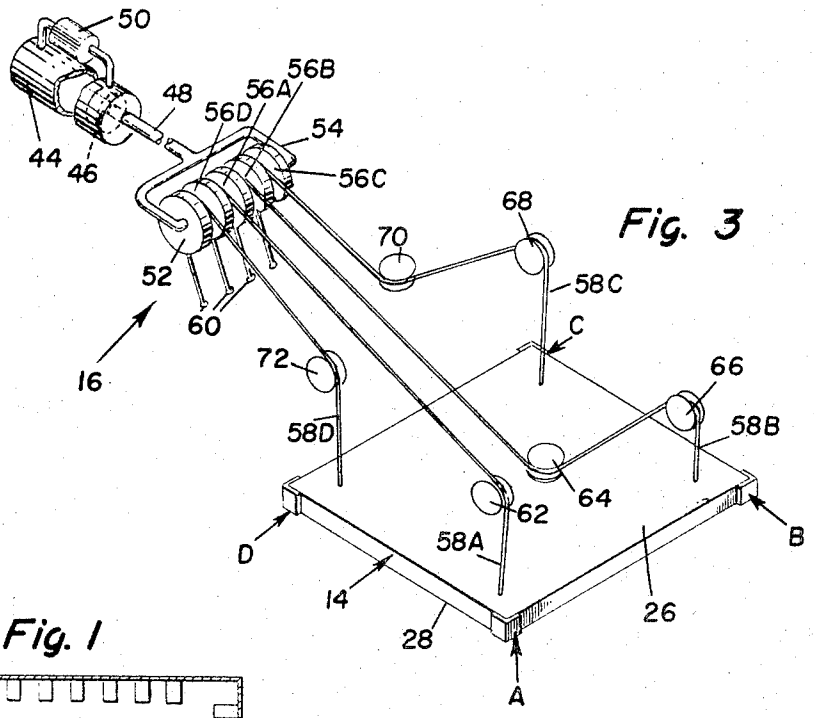


Fig. 3

Fig. 1

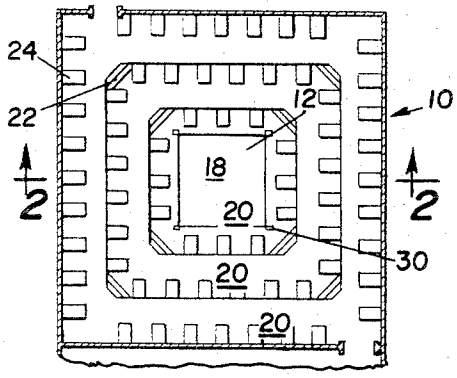


Fig. 4

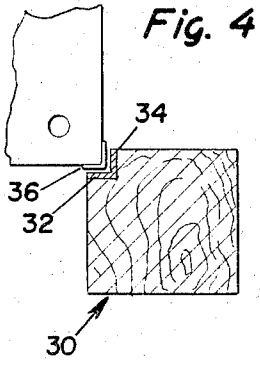
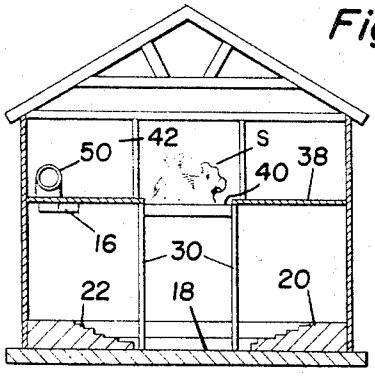


Fig. 2



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Filed April 15, 1966 2 Sheets-Sheet 2

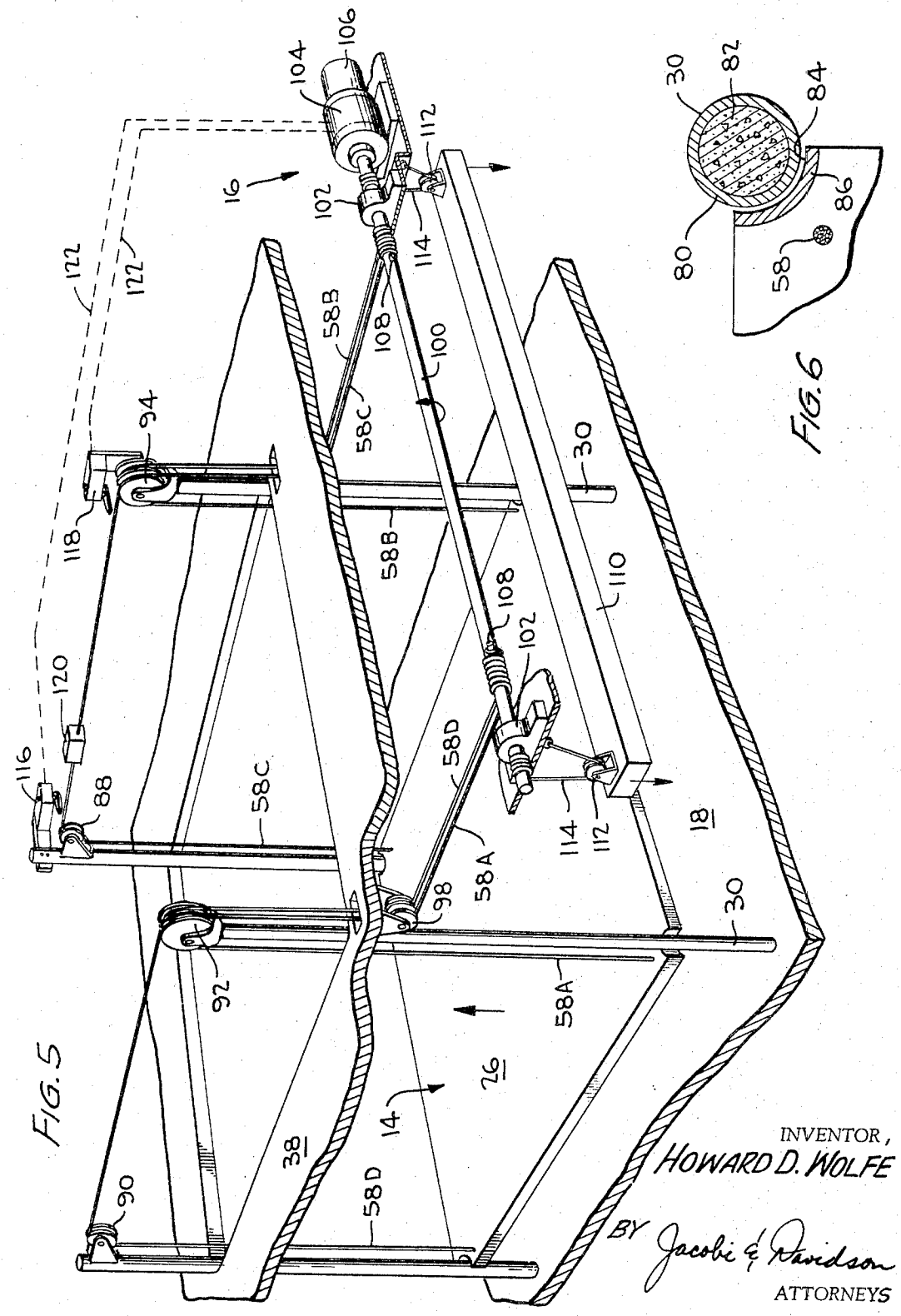

FIG. 5

FIG. 6

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THEATRE AND STAGE CONSTRUCTION

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Continuation-in-part of application Ser. No. 413,919, Nov. 25, 1964. This application Apr. 15, 1966, Ser. No. 542,841

9 Claims. (Cl. 52—7)

ABSTRACT OF THE DISCLOSURE

There is disclosed a theatre construction in which the spectators can be seated at step levels around a stage area, and wherein the stage area includes a base stage and a vertically movable stage, either one of which can be used to present certain scenes of a theatrical production. Means are incorporated for raising and lowering and guiding the movable stage in such manner as to confine the production to a limited area, thus maximizing the available seating capacity while still giving complete versatility in scene presentation.

This application is a continuation-in-part of my copending application Ser. No. 413,919, filed Nov. 25, 1964, now abandoned.

This invention relates to a theatre construction and more particularly it relates to a theatre construction having an improved form of stage movably mounted therein.

In the presentation of theatrical productions, it is often necessary to depict two or more different scenes. Each of such scenes generally requires a distinct setting having special furniture and other forms of display. Thus, when the action in a theatrical production shifts from a first scene to a second scene, it is likewise necessary to change the stage settings from a display depicting the first scene to a display depicting the second scene. In the conventional form of theatre, such changes in scenery are accomplished through the use of multiple curtains and backdrops. For example, if it is desirable to present two scenes on the stage of a conventional theatre, one such scene can be set up on the forward portion of the stage and the other such scene can be set up on the rear portion of the stage, with a curtain or backdrop dividing the forward and rear portions. When the scene on the forward portion of the stage is being utilized, the dividing curtain or backdrop prevents the audience from seeing the scene on the rear portion of the stage. When it becomes necessary to use the scene at the rear of the stage, the forward scene is pushed off into the wings of the theatre and the dividing curtain is raised to thus expose the rear stage scene to the audience's view.

As should be apparent, there are certain drawbacks and deficiencies associated with a theatre construction such as that described hereinbefore. First of all, the usable depth of the stage is limited by the fact that at least two separate scenes must be placed simultaneously upon the stage. However, a far more serious drawback with the conventional form of theatre construction is that it is not adaptable to theatre-in-the-round presentations where the audience completely surrounds a central stage. With a theatre-in-the-round form of presentation, no curtains or backdrops can be utilized, since they would cut off the view of the audience sitting behind them. Accordingly, in the conventional theatre-in-the-round presentation, a change of scenery requires that one entire scene be carried off from the stage, and that a second different scene be carried onto and properly placed upon the stage. Such scenery changing is naturally disconcerting and distracting to the audience, but more important, it tends to encourage the use of simple and flimsy scenery. Heavy furnishings cannot be

readily utilized since they would require too great an effort to remove and replace during the presentation of a production. Similarly, multiple furnishings cannot be used since the time required to remove and replace such multiple furnishings would be unduly long for the proper presentation of a play. Therefore, most theatres-in-the-round use relatively few pieces of furniture in a scene, and such furniture itself must be light-weight and simple to lift and move.

From the foregoing discussion, it should be apparent that it would be beneficial to provide a theatre construction wherein the changing of scenery in a treatre-in-the-round can be more readily accomplished. Moreover, it would appear highly desirable to provide a staging arrangement whereby one scene could be permanently left in place. By using such a staging arrangement, heavy pieces of furniture can be used, and also multiple pieces of furniture can be used, with such furniture being properly located and permanently fixed in place for the duration of a play.

One further consideration, particularly with theatres-in-the-round, is the possibility of utilizing the central staging area for some purpose other than the staging of a play. As an example, if the theatre is a "dinner-type" theatre, where food is served before the performance of the play, it would be useful to use the central staging area as a location for setting up food service tables. Similarly, if the play was not being performed on a particular night, it would appear useful to utilize the central staging area as a location for presenting an exhibition, conducting a sporting event, a public speaking area, or other related types of uses. In any of these events, it is necessary that the scenery in the central staging area be temporarily removed, and as aforesaid, it is preferable that a stage and its scenery be arranged in some manner whereby the scenery does not have to be removed during the duration of a play.

With the foregoing discussion in mind, it is, therefore, an object of the present invention to overcome the drawbacks and deficiencies associated with prior art forms of theatre construction, and to provide in their stead, an improved theatre construction.

Another object of the present invention is to provide a theatre and stage construction wherein the changing of scenery is more readily accomplished.

Another object of the present invention is to provide a theatre construction wherein a central staging area may be utilized for multiple purposes, yet where stage scenery need not ordinarily be removed.

Another object of the present invention is to provide an improved theatrical stage, particularly adapted to be used in theatres-in-the-round, wherein such stage can have a scene permanently mounted thereon, but wherein the scene can be selectively moved into and out of the visual observational field of the audience.

Another object of the present invention is to provide an improved theatre construction and an improved stage construction which permit optimum versatility in presentation of a theatrical production while not materially increasing the costs of such a production, nor complicating the presentation thereof.

Numerous other objects, advantages and salient features of the present invention will become apparent from the following detailed description, which, taken in conjunction with the annexed drawings, discloses a preferred embodiment thereof.

The foregoing objects are attained by providing a theatre construction having a central staging area with a plurality of stepped viewing levels peripherally surrounding such a central area. A stage having generally flat upper and lower surfaces is located within the central staging

area. The desired scenery may be placed upon the upper surface of the stage and may remain permanently thereon throughout the duration of a play. A suitable elevating means is provided for lifting the stage from its downward position, whereat the lower surface of the stage rests upon the base of the central staging area, to an upper or raised position whereat the scene is lifted out of view of the audience who is located on the various stepped viewing levels. When the stage has been raised in such a manner, that portion of the central staging area beneath the stage can be then utilized for any desired purpose. For instance, another scene in the play may be conducted beneath the raised stage merely by carrying in the scenery and properly placing it on the base of the central staging area. Alternatively, tables may be set up to serve refreshments to the audience before or after the play, or during the intermission thereof.

The elevating means utilized for raising and lowering the stage includes a cable system and power operated means such as a hydraulic cylinder and piston arrangement or a motor driven winding shaft for operating the cable system. Properly spaced corner posts may be placed at the corners of the stage to provide a means for guiding the stage during its ascent and descent.

A ceiling can extend over the entire theatre, with a second story being located above such a ceiling. The ceiling may be provided with an opening shaped to accommodate the stage, when such stage is raised to an elevated position. In such an event, the players may merely go directly from their dressing rooms, on the second level, and climb onto the stage to be lowered therewith. The overall effect of having the scenery lowered into view of the audience, with the actors and actresses thereon, provides a unique form of presentation which is greatly appealing to the audience.

Referring to the drawings:

FIGURE 1 is a sectional top plan view of a theatre construction in accordance with the principles of the present invention;

FIGURE 2 is a sectional side elevational view of the theatre construction;

FIGURE 3 is a perspective view of the improved stage and its elevating means;

FIGURE 4 is a fragmentary plan view of the manner of engagement of a corner of the stage with its guide post means;

FIGURE 5 is a perspective view of a modified form of stage and elevating means therefor; and

FIGURE 6 is a fragmentary plan view of the manner of engagement of a corner of the modified stage with its guide post means.

In general, the present invention includes a theatre generally designated **10**, and a central staging area generally designated **12** within that theatre. A movable stage, generally designated **14**, is movably mounted within the central staging area **12**, and an elevating means generally designated **16** can be selectively operated to raise and lower the stage **14**.

The central staging area **12** is formed with a continuous horizontal base surface **18**, such as a flat concrete slab forming the floor of the theatre **10**. A plurality of stepped and interconnected viewing levels **20** peripherally surround the central staging area **12**. Each of such viewing levels is generally horizontally planar. Movement between different levels may be accomplished through the use of stairs, such as stairs **22** illustrated in FIGURES 1 and 2. The lowermost viewing level **20** may be on the same level as the base **18** of the central staging area. Moving outward from the central staging area, each level **20** is progressively stepped upward, so that the outermost level **20** is raised considerably above the level of the base **18**. Thus, when viewing the play, a spectator on any of the outer levels may look downwardly and over the heads of those spectators positioned between himself and the central staging area. In this manner, each spectator in the theatre has a clear and unrestricted view of the central staging area **12**.

Each of the viewing levels **20** is provided with suitable seating means for accommodating spectators who will comprise the audience in the theatre. Such seating means may be of any suitable form, such as benches, chairs, tables and chairs, or any other suitable form of supporting means, and such seating means can generally be designated as **24**.

The stage **14** is formed as a shaped member having a generally continuous horizontal upper face **26** and a similar horizontal lower or bottom face **28**. The stage is formed in the shape of a quadrilateral, and is preferably a rectangle or a square. As such, the stage is provided with four separate opposed corners. A series of upstanding guide posts **30** are provided in spaced disposition about the corners of the stage **14**. The posts **30** can be formed as wooden columns or beams, and are provided with a notched-out corner **32** designed to provide a track means for the stage **14**. The size and shape of the notch **32** is suitable to accommodate a corner of the stage, in the manner shown in FIGURE 4, whereby the posts **30** and notched tracks **32** serve as a guide means for raising and lowering the stage **14**. In order to prevent any undue drag or frictional engagement between the corner of the stage and its track, an angle **34** may be disposed within the notch **32** and a similar angle **36** may be attached to the corner of the stage which fits within that notch, the angles **34** and **36** being formed of metal, plastic or other suitable material which will not bind against one another. Naturally, if desired, the notched track could be provided in the corner of the stage so that the edge of the post could fit therewithin.

As can be seen from FIGURE 2, a ceiling **38** extends over the viewing levels of the theatre, and the upper surface of such a ceiling serves as the floor for a second story which is provided in the theatre. The posts **30** extend between the base **18** at the floor of the theatre and the ceiling **38**. An opening **40** is provided in the ceiling to accommodate the stage **14** when such a stage has been elevated to a raised position. At least one room **42** is provided on the second story and is communicable with the opening **40** to thus allow access to the upper surface of the stage when the stage has been elevated to its raised position. In such a manner, if the room **42** is used as a dressing room, the actors and actresses can merely step from the room and onto the surface of the stage, when the same is raised to the position of FIGURE 2.

As aforesaid, an elevating means **16** is provided for moving the stage between its lowered position and its raised position. The elevating means **16** includes a suitable cable means for supporting the stage. For eace of description, the corners of the stage in FIGURE 3 have been designated A, B, C and D. An actuating means is provided for operating the cable means and such an actuating means includes a cylinder **44** having a piston **46** movably mounted therein, a piston rod **48** extending outwardly from the cylinder toward the stage, and a suitable pump or compressor **50** connected to the cylinder in a conventional manner. When the pump or compressor **50** is operated, fluid pressure will be selectively supplied to one side of the piston **46** or to the other side thereof, and such fluid pressure will cause the piston to move in a desired direction to either distend or retract the piston rod **48**. As shown in FIGURE 2, the pump or compressor **50** may be located within the room **42** of the second story of the theatre, and the cylinder and piston mechanism may also be provided in that room, or alternatively, may be provided on the underside of the ceiling **38**.

The cylinder and piston arrangement is disposed on one side of the stage, and as shown in FIGURE 3, such disposition is along the side of the stage having the corners C and D. A cable means is coupled to the cylinder and piston arrangement by being connected to the piston rod **48**, and through such a cable means, horizontal or linear move-

ment of the piston rod **48** is translated into vertical movement of the stage **14** to raise or lower the same.

The cable means includes a multi-track sheave **52** which is pivotally attached at the outer end of the piston rod **48**, as, for instance, by a bifurcated yoke means **54**. Four tracks **56** are provided in the sheave with such tracks being denominated as **56A**, **56B**, **56C** and **56D**. Similarly, four cables **58** are provided, with such cables **58** being denominated **58A**, **58B**, **58C** and **58D**. Each of the cables **58** has a fixed end **60**, with all such cable fixed ends being at a common location and elevation, as, for example, the underside of the ceiling **38**. From its fixed end **60**, each cable is trained over the sheave **52**, in its appropriate track **56**, and such cable then extends toward its appropriate corner on the stage **14**.

Pulley means are mounted on each of the posts **30**, with all such pulleys being mounted at a substantially common height above the corners of the stage. On the post **30** extending upward from corner A, two pulleys **62** and **64** are provided, with the pulley **62** having a generally vertical track and the pulley **64** having a generally horizontal track. Pulleys **66** and **68** are mounted respectively on the posts **30** extending above corners B and C, with each of such pulleys having a generally vertical track. Pulleys **70** and **72** are mounted on the post **30** extending above corner D, with pulley **70** having a generally horizontal track and pulley **72** having a generally vertical track.

Although the posts **30** have not been shown in FIGURE 3, for ease of illustration, the manner of connection of the cables **58** should be apparent. The cable **58A** is reeved in the track **56A**, extends over the pulley **62** and then downward to connect with stage corner A. The cable **58B** is reeved in the track **56B**, extends around the pulley **64**, over the pulley **66** and then downward to connect with stage corner B. The cable **58C** is reeved in the track **56C**, extends around the pulley **70**, over the pulley **68** and then downward to connect with stage corner C. Finally, the cable **58D** is reeved in the track **56D**, extends over the pulley **72** and then downward to connect with stage corner D.

Using such a cable arrangement, the operation of the elevating means **16** should be apparent. When the pump, or compressor **50** moves the piston and piston rod **48** through an increment of travel, the sheave **52** will be likewise moved. As the sheave **52** pulls away from the stage, the cables **58** are also pulled, thereby lifting the stage, with an equal lifting effect being applied at all four corners. Reversing the direction of movement of the sheave will obviously produce a lowering in the stage, in an apparent manner.

If attention is directed to the modification shown in FIGURES 5 and 6, it will be seen that the corner guide posts **30** are formed as cylindrical members, rather than square beams, as shown in FIGURE 4. Thus, for example, the posts **30** can be elongated pipes **80**, either hollow or filled with concrete **82**. A plastic or metal face **86** may be provided at each notch **84** to ride along the surface of the posts **30**.

The posts **30** in the embodiment of FIGURE 5 extend above the second story **38** for preselected distance and have pulley means mounted at their upper ends. On the posts **30** extending upward at the corners C and D, single groove pulleys **88** and **90**, respectively, are provided, each of such pulleys having a vertical track. On the posts **30** extending upward at the corners A and B, double groove pulleys **92** and **94**, respectively, are provided, each of such pulleys having vertical tracks.

The cable **58C** is reeved over the pulley **88** and the inner groove of the pulley **94**. The cable **58B** is reeved over the outer groove of the pulley **94**. The cable **58D** is reeved over the pulley **90** and the inner groove of the pulley **92**. The cable **58A** is reeved over the outer groove of the pulley **92**.

A double grooved pulley **98** is disposed beneath the second story **38** adjacent the post extending from the corner A. The cables **58A** and **58D** extend downward from the pulley **92**, train over the pulley **98** and traverse horizontally either through or beneath the second story **38**. Another double grooved pulley, not shown, but similar to pulley **98**, is disposed beneath the second story **38** adjacent the post at the corner B, and the cables **58B** and **58C** extend downward from the pulley **94**, train thereover, and traverse in parallel relation to the cables **58A** and **58D**.

The elevating means **16** includes an elongated winding shaft **100** mounted in journal bearings **102**, **102** spaced inward from the ends thereof. One end of the shaft **100** is coupled with a winding motor **104** having a brake **106** associated therewith. The cables **58A**, **58B**, **58C** and **58D** wrap around the shaft **100** between the bearings **102** and and have their ends fixed to the shaft, as by means of studs **108**.

A heavy counterbalance block or counterweight **110**, formed of concrete or the like, is disposed beneath the shaft **100**. Pulleys **112** are mounted on the upper surface of the block **110** adjacent the ends thereof. Heavy supporting cables **114** extend from a fixed mount about the pulleys **112** and then wrap around the shaft **100** outboard of the bearings **102**.

As the motor **104** operates to rotate the shaft **100**, the cables **58** wind about the shaft and the stage **14** raises from its lowermost position toward its uppermost position. As the cables **58** wind onto the shaft **100** thereby raising the stage **14**, the cables **114** unwind therefrom, thus lowering the counterweight **110**. The motor **104** is of the reversible type, thereby enabling the shaft to be driven reversely. When such reverse driving occurs, the cables **58** unwind from the shaft **100** causing the stage to lower, and simultaneously, the cables **114** wind onto the shaft **100** causing the counterweight **110** to raise.

As a control means, a pair of spaced limit switches **116** and **118** can be spaced apart adjacent the cable **58C** or the cable **58D**, as such cables extend between the upper ends of the posts **30**. A block **120** is carried by the cable **58C** and is engageable with the limit switches **116** and **118** to provide control for the motor **104**, as schematically shown at **122**.

In the utilization of the improved stage and theatre construction of the present invention, a scene, designated S in FIGURE 2, may be placed upon the upper surface **26** of the stage **14**. Such a scene may include multiple items of furniture, including heavy and bulky pieces, and may be relatively firmly fixed in place, since it can remain on the stage **14** for the duration of the run of the play. Prior to presentation of the play, the stage may be raised to its elevated position shown in FIGURE 2, and the base surface **18** is thus opened and unencumbered. Temporary tables or other similar expedients may be placed upon the surface **18** for service of food and refreshments, sale of programs, and the like. Then, shortly prior to commencement of the play, the central area is cleared and the base surface is unobstructed. To open the play, the pump or compressor **50** of the motor **104** may be actuated to lower the stage from its elevated position to a lowered position whereat the bottom surface **28** of the stage rests upon the base surface **18**. As the stage descends, the players in the opening scene may be already located on the stage, having entered from the room **42** on the second story of the theatre. When the stage finally is resting upon and is supported by the base surface **18**, operation of the elevating means **16** is temporarily terminated. The play may then proceed in the usual manner.

When it becomes necessary to change scenes or to temporarily shift the action to a different scene in the play, the elevating means **16** may be actuated to raise the stage **14** to its elevated position. Such raising may be accomplished with the lights temporarily dimmed or darkened. Simultaneously with such raising, auxiliary pieces may be carried in across the viewing levels and may be placed upon the base surface **18** to set up a

separate or second scene. Such a scene, of course, need not have the elaborate surroundings of the main scene S, but instead, may be a few simple props which can be readily moved to and away from the surface **18**. Once the auxiliary scene has been enacted on the base surface **18**, the lights can again be dimmed or darkened, the props from the auxiliary scene can be removed, and simultaneously the stage **14** can be lowered to again bring the main scene S into view of the audience. A similar sequence of steps may be carried out at intermissions during the play, if desired, to again install refreshment stands or program sales on the base surface **18**, and to allow the audience to cross freely beneath the raised stage **14**.

It is believed that the improved manner of space utilization and theatrical presentation will be apparent from the foregoing matter. Not only does a construction of this type allow the use of a complicated and elaborate main scene S which need not be removed from the stage **14** at any time, but it further enables the theatre to make optimum use of the auxiliary space in the central staging area beneath the stage **14**. This naturally lends great versatility to the theatre and enables a central staging area to be used for a variety of different purposes, thus rendering the theatre highly adaptable to various uses. Moreover, the very use of the movable stage itself, and the concept of raising and lowering the scenes and the actors and actresses to move them selectively into and out of the viewing area of the audience, in itself presents a unique and unusual staging arrangement which is greatly appreciated by the audience within the theatre.

After reading the foregoing detailed description, it should be apparent that the objects set forth at the outset of the specification have been successfully achieved. Accordingly,

What is claimed is:

1. A theatre construction comprising:

(a) an enclosed area defining a theatre;

(b) a stationary horizontal base surface stage within said enclosed area;

(c) a plurality of successively stepped horizontal viewing levels on each side of said base surface stage and being disposed at successively higher vertical distances with respect thereto as the lateral distance of said viewing levels therefrom increases;

(d) seating means for accommodating spectators on each of said horizontal viewing levels;

(e) a vertically movable stage;

(f) means defining the path of vertical movement of said vertically movable stage;

(g) a ceiling spaced above said base surface stage and said viewing levels with said ceiling having an opening therein aligned with said vertically moving stage and a surface on top of said ceiling juxtaposed to said opening; and

(h) drive means for raising and lowering said vertically movable stage to and from a first position wherein said vertically movable stage rests on and is supported by said base surface stage and a second position wherein access to said vertically movable stage from said surface on top of said ceiling is provided; whereby scenery and personnel on said vertically movable stage are viewable by spectators seated on said horizontal viewing levels when said vertically movable stage is in said first position, and scenery and personnel on said base surface stage are viewable by spectators seated on said horizontal viewing levels when said vertically movable stage is in said second position.

2. A theatre construction as defined in claim **1** wherein said vertically movable stage is generally rectangular and wherein said drive means includes a supporting cable system attached adjacent each corner of said stage.

3. A theatre construction as defined in claim **2** further including post means engaging the corners of said vertically movable stage to guide the same during raising and lowering operations.

4. A theatre construction as defined in claim **3** wherein said drive means further includes a selectively operable cylinder and piston means with said piston operating said cable system.

5. A theatre construction as defined in claim **4** wherein said cable system includes a sheave operatively connected to said piston, at least one pulley mounted on each of said post means, and a plurality of cables, each extending over said sheave and over at least one pulley and thereafter being connected adjacent a respective vertically movable stage corner.

6. A theatre construction as defined in claim **3** wherein said drive means includes a rotatable shaft about which said cable system winds and means for rotating said shaft to wind and unwind said cable system.

7. A theatre construction as defined in claim **6** further including a counterweight means coupled with said shaft.

8. A theatre construction as defined in claim **1** wherein said opening in said ceiling is congruent with the shape of said vertically movable stage.

9. A theatre construction as defined in claim **8** but further characterized by at least one room above said ceiling communicating with said vertically movable stage opening whereby, when said vertically movable stage is in a raised position, personnel and scenery may be placed upon or removed from said vertically movable stage upper face.

References Cited

UNITED STATES PATENTS

1,616,198	2/1927	Partington	52—7
2,499,791	3/1950	Spencer	187—3
2,602,196	7/1952	Pelton	52—6
2,848,977	8/1958	Prestrud et al.	254—189
3,210,895	10/1965	Graf	52—6

FOREIGN PATENTS

519,607	3/1931	Germany.
852,135	10/1952	Germany.

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