

Feb. 9, 1954

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2,668,331

FOLDABLE PLATFORM STAGE

Filed Oct. 27, 1949

3 Sheets-Sheet 1

Fig. 1

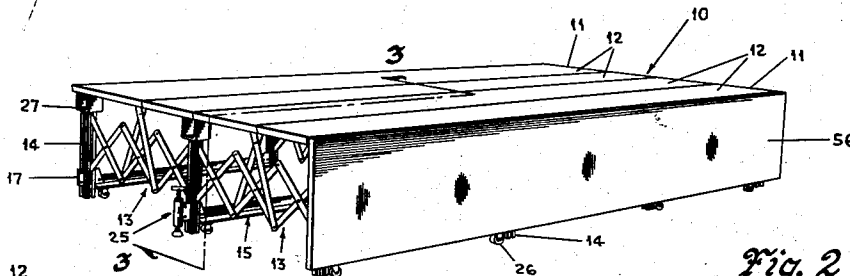


Fig. 2

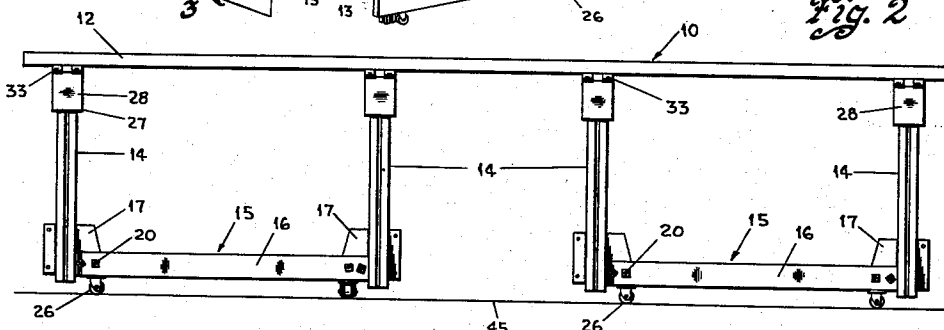
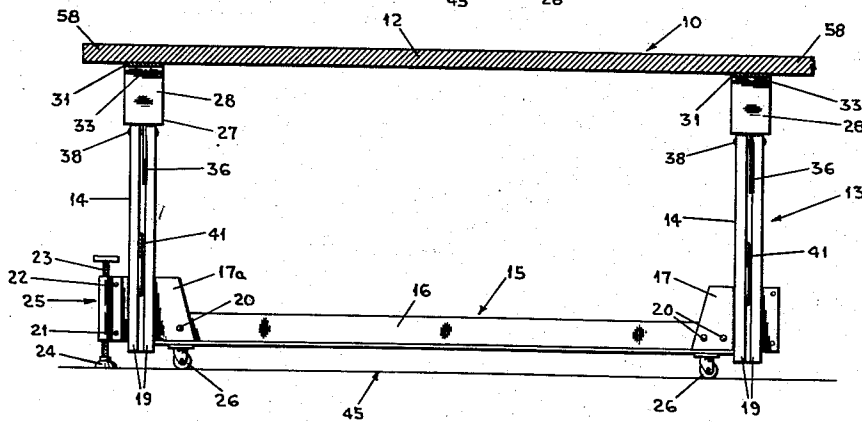


Fig. 3

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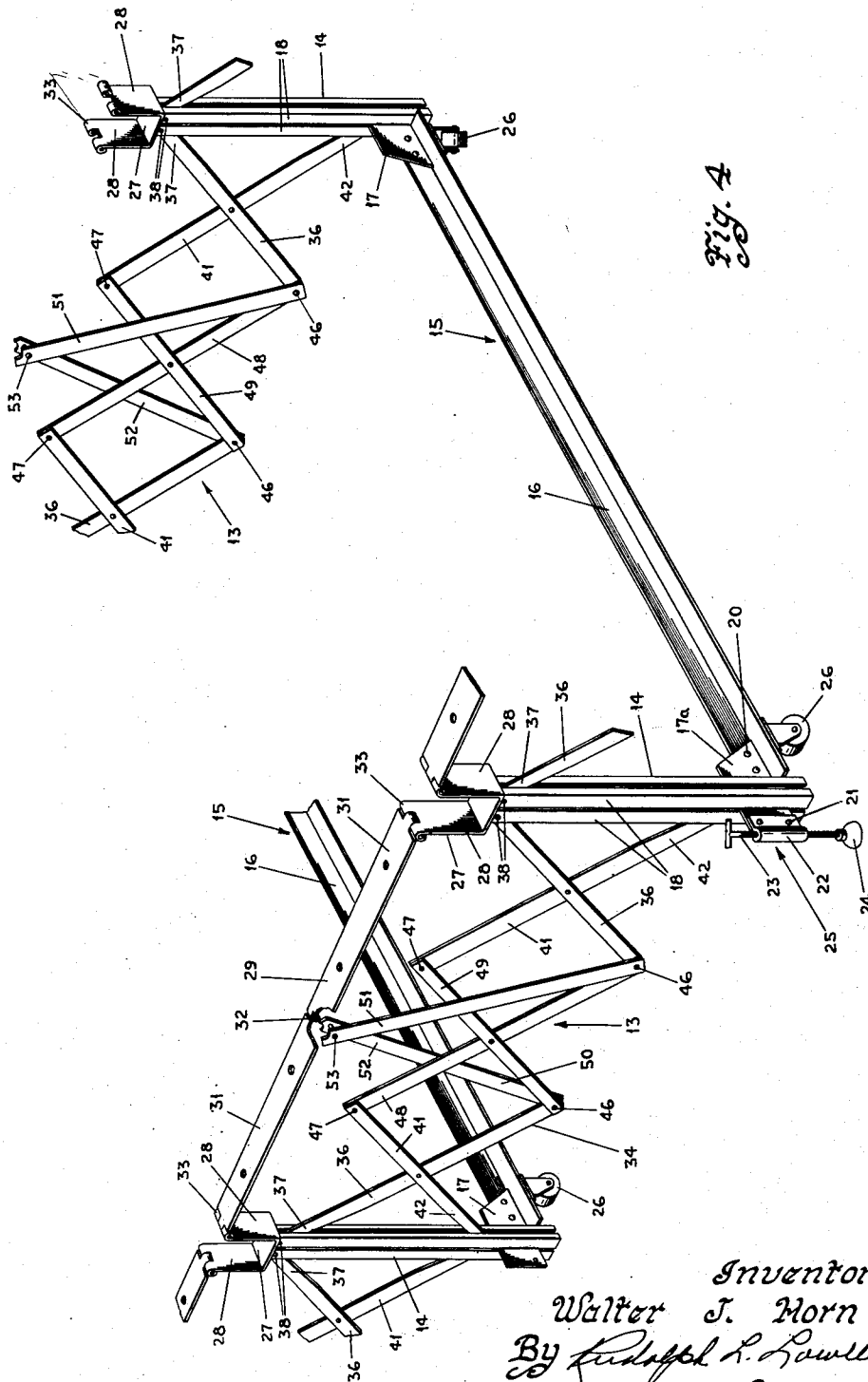


Fig. 4

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Fig. 5

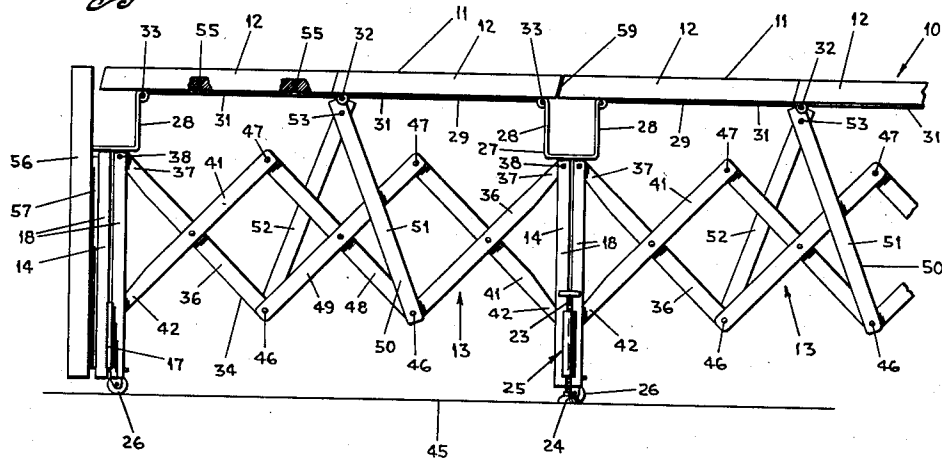
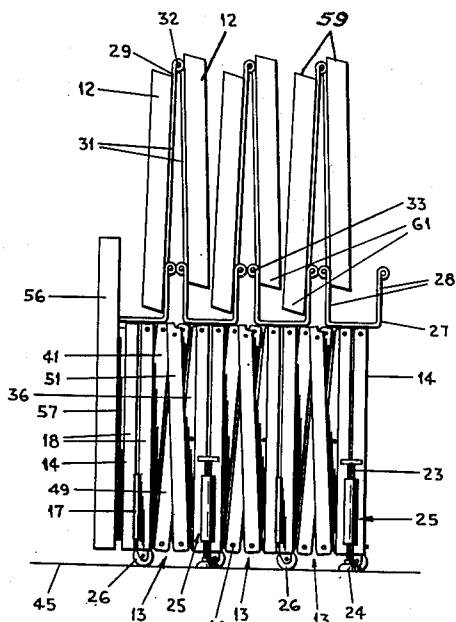


Fig. 6

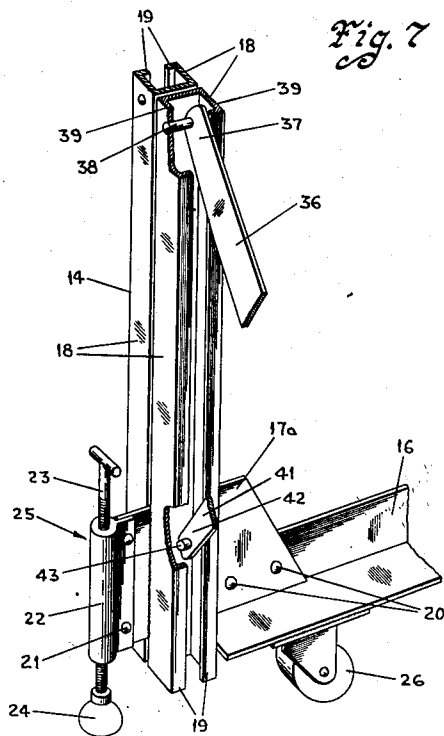


Fig. 7

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FOLDABLE PLATFORM STAGE

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3 Claims. (Cl. 20—1.123)

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This invention relates generally to temporary stages for performance purposes, and in particular to a temporary platform stage of a foldable type.

Temporary stages now generally used in schools, hotels, halls and the like to accommodate performers or speakers for community and group gatherings usually comprise unit box structures, placed together to form a complete stage, or flooring or planks extended between upright supports. These temporary stages are objectionable in that they are generally bulky and clumsy to handle, especially in limited spaces such as narrow hallways and building elevators, and unstable in supporting people and objects thereon. Further, and especially where the performers are in motion, the separate sections of such stages tend to move relative to each other so as to create a physical hazard to the performers.

It is an object of this invention, therefore, to provide an improved temporary platform stage.

A further object of this invention is to provide a temporary platform stage of a rigid and stable construction and capable of being locked against movement relative to its supporting floor surface.

Still another object of this invention is to provide a sectional temporary stage, in which the sections are interconnected for folding and unfolding movement such that the floor space of the stage may be varied by increments corresponding to the floor space of the sections.

A further object of this invention is to provide a temporary platform stage which is attractive in appearance, capable of being conveniently handled for transport, readily movable on a floor surface for location purposes, adapted to be locked in a fixed position at a desired location, and occupying a minimum of storage space when not in use.

A feature of this invention is found in the provision of a temporary platform stage in which a series of longitudinally extended transversely foldable floor units are movably connected together in a side-by-side relation. The floor units include upright transversely spaced supporting structures, interconnected so as to be opened in succession on unfolding of the platform. The supporting structures are provided with at least three portions in contact engagement with the flooring of a floor unit at positions spaced transversely of a floor unit, in its unfolded position, so as to positively maintain the floor surfaces of all of the floor units in a common plane.

Another feature of this invention is found in

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the provision of a temporary platform stage in which a plurality of sectional floor units are hinged together for successive movement to unfolded positions in a horizontal plane and to folded upright positions. Interconnected upright ground supporting structures in the floor units are movable to folded and unfolded positions in response to the movement of their corresponding floor sections, whereby the floor space of the stage is variable between limits defined by the floor space of a single floor unit and the combined floor surface of all of the floor units.

Further objects, features and advantages of this invention will become apparent from the following description when taken in connection with the accompanying drawings, in which:

Fig. 1 is a front perspective view of the temporary platform stage of this invention;

Fig. 2 is an enlarged fragmentary rear elevational view of the stage shown in Fig. 1;

Fig. 3 is an enlarged sectional view as seen substantially along the line 3—3 in Fig. 1;

Fig. 4 is an enlarged fragmentary perspective view of a floor supporting structure embodied in one of the sectional floor units forming the stage of this invention;

Fig. 5 is an enlarged fragmentary side elevational view of the stage in its unfolded or open position;

Fig. 6 is a view illustrated similarly to Fig. 5 showing the stage in a closed or folded position; and

Fig. 7 is a detail perspective view showing the assembly of an upright frame member and lazy tong system which forms part of the floor supporting structure illustrated in Fig. 4.

With reference to the drawings the platform stage of this invention is illustrated in Figs. 1, 2 and 5 as including a platform, indicated generally at 10, comprised of a series of longitudinally extended transversely foldable floor units 11 arranged in a side-by-side relation. Each floor unit is comprised of a pair of wooden floor boards or sections 12, and an associated transversely foldable floor supporting structure designated generally as 13. Since each floor-supporting structure 13 and floor section 12 are of a similar construction, and relatively assembled in a similar manner, only one of such assemblies will be referred to in detail in the following description with corresponding numerals being used to designate like parts.

Each floor-supporting structure 13 (Figs. 3 and 4) includes a pair of substantially U-shape upright frames 15 arranged in a side-by-side rela-

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tion and extended longitudinally of a corresponding floor unit 11. The leg members 14 of a U-frame 15 are formed of a pair of substantially channel shape members 18, arranged in a back-to-back relation and formed at their outer or open sides with a pair of oppositely arranged inwardly extended track or guide portions 19, as best appears in Fig. 7. The base member 16, of a U-frame 15, is of an angle iron construction and has secured at each end, as by bolts 20, upright plate extensions 17 which are positioned between a pair of adjacent channel members 18 and extend laterally outwardly therefrom. The plate extensions 17 are secured to their corresponding channel members 18, as by welding or like means. Each U-frame 15 is carried on castor wheels 26 to provide for the ready movement of the stage on a floor surface.

In order to lock the stage against movement on a floor, certain of the plate members 17, and as indicated for the plate member 17a in Fig. 4, are provided with a floor-locking unit 25 comprising an internally threaded upright sleeve member 22 secured as by bolts 21 to the outer end of the plate member 17a. A hand screw 23, threadable within the sleeve member 22, is provided at its lower end with a floor-gripping vacuum cup member 24.

Mounted at the upper end of each leg 14 (Fig. 4) is a U-shape hinge supporting member 27 having the legs 28 thereof spaced transversely of a floor unit 11. A hinge 29 has a pair of hinge members 31 pivoted together at their inner ends, as indicated at 32. The outer ends of the hinge members 31 are pivoted at 33 to the adjacent legs 28 on adjacent uprights or legs 14 positioned transversely of a floor unit 11. The pivot connections 33 are such that when the hinge 29 is extended in a horizontal plane, as illustrated in Figs. 4 and 5, the top surface of the hinge is substantially flush with the top edges of the legs 28 of a U-support 27.

Each floor section 12 (Fig. 5) is of a width greater than the length of a hinge member 31, so as to overhang the space between the legs 28 of a hinge support 27, when the platform is unfolded, for a purpose to appear later. The floor sections 12 are secured to the top sides of the hinge members 31 by screws 55 or the like.

A lazy tong link system 34 is movably connected between a pair of transversely opposite uprights or legs 14 at a position below the U-supports 27 (Fig. 4). Links 36 have their upper or free ends 37 extended within the open side of a channel member 18 for pivotal support on a pivot pin 38 carried between the legs 29 of a channel member 18, as best appears in Fig. 7. The links 41, which are connected in a scissors arrangement with the links 36, have their lower or free ends 42 provided with a transverse pin or roller 43 which is rideable on the tracks 19 of a channel member 18.

Intermediate of and pivotally connected with each pair of associated links 36 and 41, at 46 and 47, respectively, is a third pair of associated links 48 and 49. It is seen, therefore, that each lazy tong system 34 is comprised of a series of three pairs of links pivoted in a scissors fashion, and pivotally interconnected so as to be folded and unfolded in a direction transversely of a floor unit 11, with the open or unfolded position of a link system being limited by the movement of its respective hinge 29 to a horizontal position.

This horizontal position of the hinge 29 is defined by the engagement of its pivot connection

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32 with a combination hinge stop and support 50 associated with each lazy tong system 34 and comprising a pair of links 51 and 52 (Figs. 4 and 5) having their adjacent ends pivoted together at 53. The links 51 and 52 are arranged in a straddling relation, relative to the links 48 and 49, and in an inverted V-shape relation with their lower ends pivoted at 46.

As shown in Figs. 4 and 5, when the link system 34 is extended and the hinge 29 is open, the apex or upper end of the combination hinge stop and support 50 is projected upwardly to a level substantially in the plane of the top edges of the legs 28 of the hinge supports 27 and at a position intermediate such supports for contact engagement with the hinge connection 32. As a result, the hinge 29 is positively locked against downward movement out of a horizontal position or plane, since any downward pressure applied on the hinge pivot 32 and against the combination hinge stop and support 50 is ineffective to close the link system.

In the use of the stage of this invention, assume the platform 10 to be in its open position shown in Figs. 1 and 5. At this open position, the floor sections 12 are arranged closely adjacent to each other and in a common plane so as to form an over-all smooth floor surface for the platform 10. This continuous floor surface is achieved as a result of the positioning of the hinges 29 in horizontal planes in the manner previously described. Further, each floor unit 11 is positively supported against downward movement at three points spaced transversely thereof, namely, at the pivot connections 32 and 33, and in turn each floor section 12 is positively supported at the opposite sides thereof. Thus the support 50 supports the adjacent sides of a pair of sections 12 formed as a part of a floor unit 11, and the outer sides of such pairs of sections 12 are supported at the pivots 33 on adjacent supporting legs 14. Positive stability and rigidity is thus given to the platform 10. In its open position, the complete stage is readily movable over a floor surface 45 on the castor wheels 26. By merely turning the hand screws 23 downwardly, the suction cups 24 are pressed into gripping engagement with the floor 45 to positively hold the stage at a desired location.

For the purpose of appearance, the front side of the stage may be provided with an upright back board 56 (Figs. 1 and 5) which is suitably secured, as indicated at 57, to the upright legs 14 on the forward one of the U-frames 15. To facilitate this assembly, the forward legs of the U-members 27, associated with the front legs 14, are removed, as clearly appears in Fig. 5.

To assume the stability of the stage, it is contemplated that the U-frames 15, when the lazy tong systems 34 are in their extended positions, be spaced a distance apart of about thirty inches, transversely of the stage. Also, and with reference to Fig. 2, it is contemplated that the legs 14 of a U-frame 15 be spaced apart a distance of about thirty inches. Likewise, each series of frame members 15 and associated tong systems 34 are spaced transversely of the stage a distance apart of about thirty inches. As a result, regardless of the longitudinal length of the stage, the floor supporting structures 13, one or more of which may be used in a floor unit 11, can be spaced transversely of a floor unit such that the adjacent upright legs 14 in the stage will be a distance apart of about thirty inches. It is ap-

parent, of course, that this spacing of the legs 14 is not critical.

When a stage having a larger floor surface than the floor surface obtained by the platform 10 is desired, two or more stages of this invention can be arranged adjacent to each other. Thus, as shown in Fig. 3, the ends 58 of a floor section 12 project laterally beyond the floor stops 25. The floor sections 12 of the separate stages are thus movable end to end in abutting engagement to form a continuous stage platform. This is accomplished by moving a first stage to a desired position, locking it in place by manipulation of the floor stops 25, and then moving a second stage into a desired relation therewith, and locking the second stage in place by the floor stops 25 associated therewith.

In the folding of the stage, it is only necessary to pull upwardly on a floor unit 11 at the pivot connection 32 corresponding thereto whereby a hinge 29 is folded upwardly to function as an actuating member for relatively moving the legs 14 connected thereto toward each other, with this inward movement of the legs 14 in turn providing for a closing of the link system 34 connected therebetween, as shown in Fig. 6. On upward movement of a hinge member 29, the floor sections 12 secured thereto are pivotally moved downwardly toward each other, with the adjacent sides of the floor sections 12 being beveled, as indicated at 59, to provide a suitable working clearance between their adjacent sides. The hinge members 31, on movement of a hinge 29, are movable to upright positions in a substantially back-to-back relation by virtue of the U-shape construction of the hinge supports 27 which are adapted to accommodate, between the legs 28 thereof, the sides 61 of adjacent floor units 11 (Fig. 6). Further, the apex of the hinge stop 50, on closing movement of its associated lazy tong system 34, is moved downwardly so as to be within the vertical confines of such tong system in its folded position. As a result, the frames 15 and lazy tong systems 34 are capable of being closely folded together, without interference from the floor sections 12, which are folded together in upright positions, and in substantially a back-to-back relation, at a level above the upright legs 14.

As shown in Fig. 6, the floor stops 25 are mounted on alternate ones of the upright legs 14 in a direction transversely of the stage. By this arrangement one or more of the floor units 11 may be extended, independently of the remaining floor units 11, and then locked in extended positions by manipulation of the floor stops 25.

From a consideration of the above description it is seen that the invention provides a temporary platform stage of a foldable type capable of being opened to form a rigidly supported continuous floor surface. The floor units 11, comprising the stage, may be individually extended so that the floor space of the platform 10 may be varied between limits, defined by the floor surface of a single floor unit 11, and the floor surface of the combined floor units 11. This floor space may be increased further by the use of one or more of the platform stages of this invention. Also, the stage is readily movable within a hall or auditorium, whether in an open or closed position, by its support on the castor wheels or rollers 26. In its folded position, the component parts of the stage are nested together so as to occupy a minimum of space for storage purposes, and to minimize bulkiness for handling and transport purposes.

Although the invention has been described with respect to a preferred embodiment thereof, it is to be understood that it is not to be so limited since changes can be made therein which are within the full-intended scope of this invention, as defined by the appended claims.

I claim:

1. A folding stage comprising a sectional floor structure, upright members for supporting said structure spaced longitudinally of said floor structure and arranged in rows extended transversely of said floor structure, upright U-shape members carried at the top ends of said upright members, with the legs of said U-shape members being in planes extended longitudinally of said floor structure, hinge structures each having a pivot intermediate its ends pivotally connected to and extending between the adjacent legs of adjacent ones of said U-shape members for movement to an unfolded horizontal position and to a position folded upwardly, horizontally foldable lazy tong systems extended between and movably connected to adjacent ones of said upright members permitting folding and unfolding of said hinge structures transversely of said floor structure, and means for securing the sections of said floor structure to the upper side of said hinge structures for hinged movement therewith, said floor sections extending slightly beyond said pivotal connection of the hinge structures to said adjacent legs and being foldable upwardly to vertical positions against each other, with the lower sides of adjacent pairs thereof receivable within longitudinally opposite ones of said U-shape members.

2. A folding stage having movable floor boards, comprising a plurality of pairs of vertical frame structures disposed side-by-side, each including an upright frame support at the opposite ends thereof, the supports of one of said frame structures being in opposed relation to those of the other, a pair of parallel horizontally foldable lazy tong systems each extended between an upright support of one frame structure and an opposing upright support of the other frame structure and mounted for folding and unfolding movement transversely of said frame structures to permit movement of said structures towards and away from each other and including links disposed in vertical planes and reversely inclined from a pivot connecting their lower ends, a pair of floor board hinge members pivotally connected together at their inner ends at a point substantially midway between said frame structures for movement about a horizontal axis and having their outer ends pivotally connected to the top of said adjacent upright supports for movement about a horizontal axis, said floor board hinge members being in vertical parallel positions when said lazy tong systems are folded and being in horizontal positions forming a platform when said lazy tong systems are extended, and a pair of upstanding supporting links positioned substantially midway between said upright supports, said links being connected at their lower ends to at least two pivotal connections connecting adjacent reversely inclined links of said lazy tong system which move upwardly upon unfolding movement of said system, said supporting links being pivotally interconnected at their other ends and of a length sufficient to engage and support the pivotal connection between said hinge members when the lazy tong system is extended.

3. A folding stage having foldable floor boards, comprising a pair of vertical frame structures disposed side-by-side each including an upright

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frame support at the opposite ends thereof, the supports of one of said frame structures being in opposed relation to those of the other, a pair of parallel horizontally foldable lazy tong systems each extended between an upright support of one frame structure and an opposing upright support of the other frame structure and mounted for folding and unfolding movement transversely of said frame structures to permit movement of said structures towards and away from each other while maintaining them in vertical position and including links disposed in vertical planes and reversely inclined from a pivot connecting their lower ends, a pair of floor board supporting hinge members pivotally connected together at their inner ends at a point substantially midway between said frame structures for movement about a horizontal axis and having their outer ends pivotally connected to the top of said upright supports for movement about a horizontal axis, a floor board secured to each member, said floor boards being in vertical parallel positions when said lazy tong systems are folded and in horizontal positions forming a plat-

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form when said lazy tong systems are extended, and a pair of upstanding supporting links associated with each lazy tong system each supporting link being connected at its lower end to one of said pivots approximately midway between said upright supports, said supporting links being pivotally interconnected at their other ends and of a length sufficient to engage and support the pivotal connection between said hinge members when the lazy tong systems are extended and the floor boards are horizontal.

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