March 4, 1969 G. F. BOWDEN ET AL 3,430,910

STRINGER-RELEASING SHORE ASSEMBLY FOR A CONCRETE SLAB FORM INSTALLATION

Filed Feb. 6, 1967

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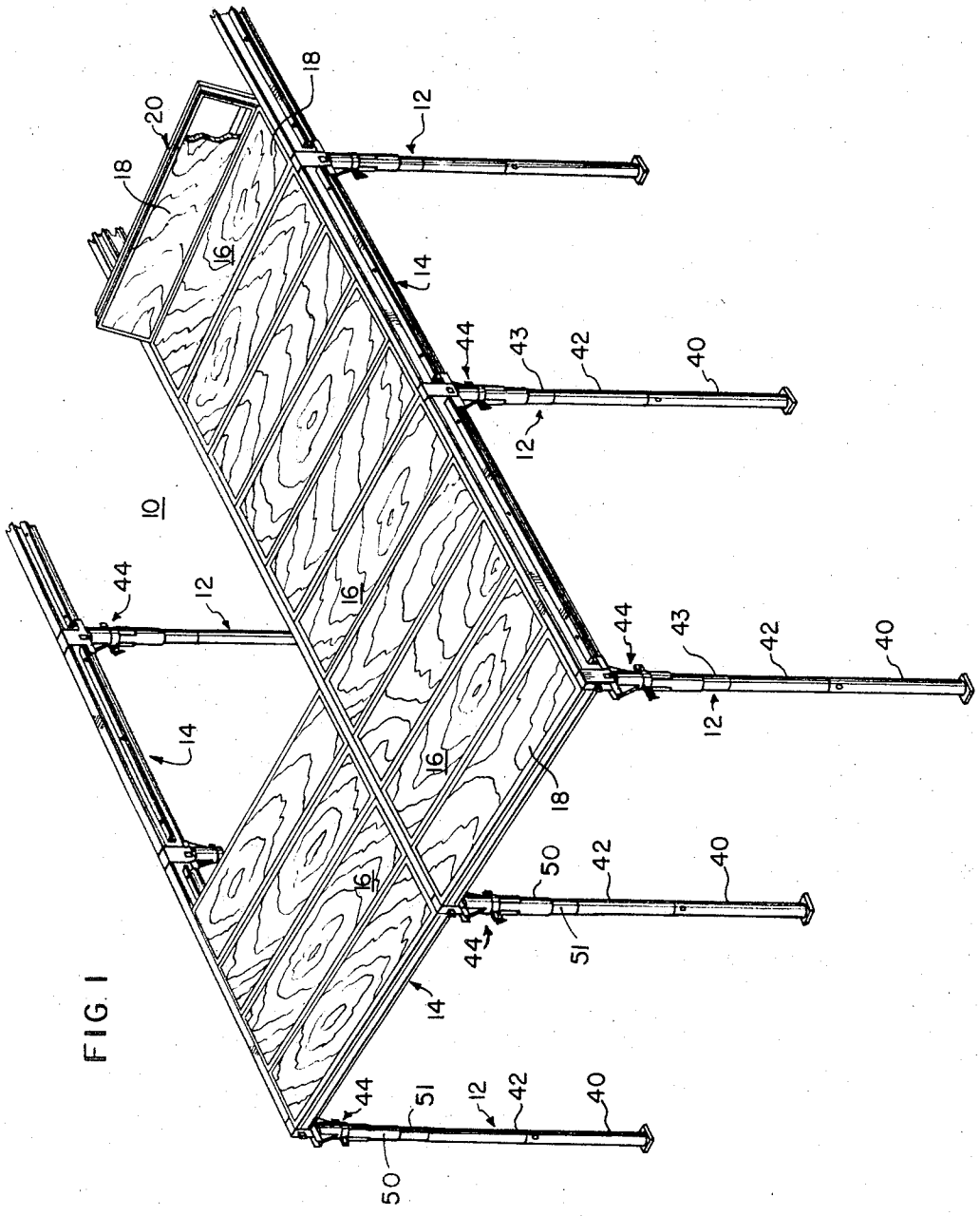


FIG. 1

INVENTORS.
GEORGE F. BOWDEN
RICHARD T. DAGIEL
By Norman Gerlach

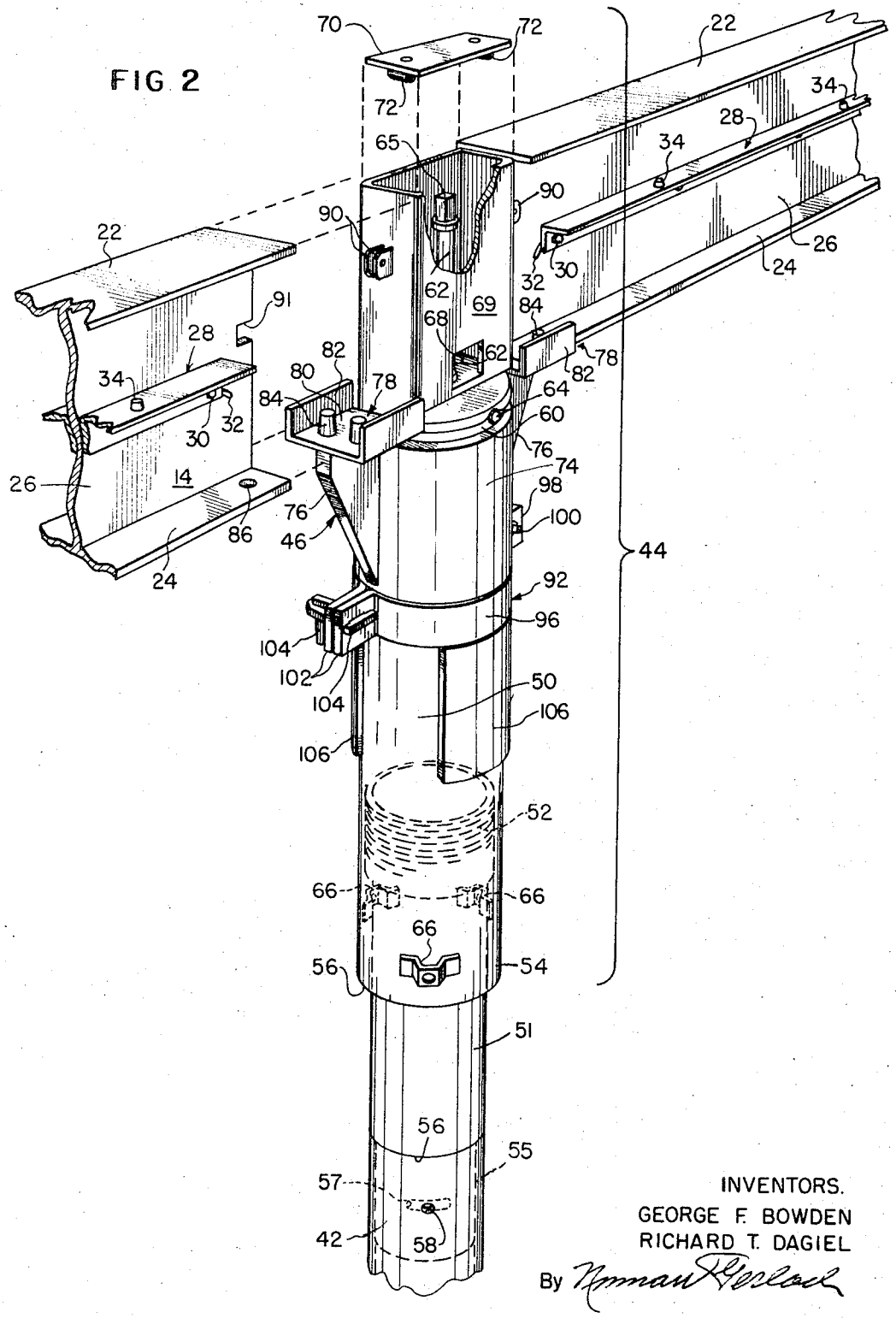
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STRINGER-RELEASING SHORE ASSEMBLY FOR A CONCRETE SLAB FORM INSTALLATION

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FIG. 2



INVENTORS.
GEORGE F. BOWDEN
RICHARD T. DAGIEL
By Norman Peebles

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STRINGER-RELEASING SHORE ASSEMBLY FOR A CONCRETE SLAB FORM INSTALLATION

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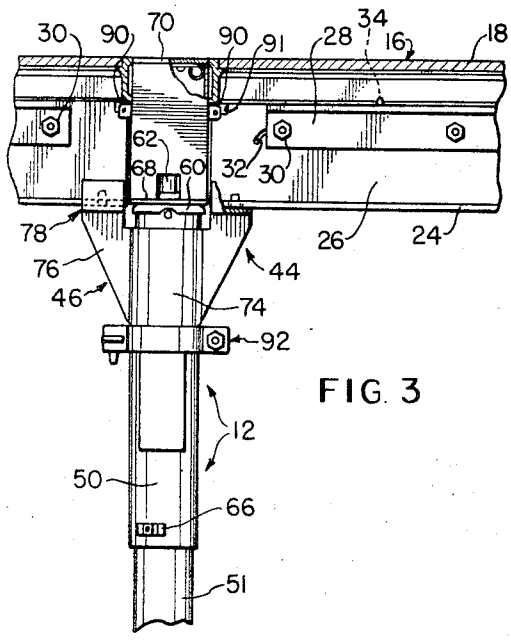


FIG. 3

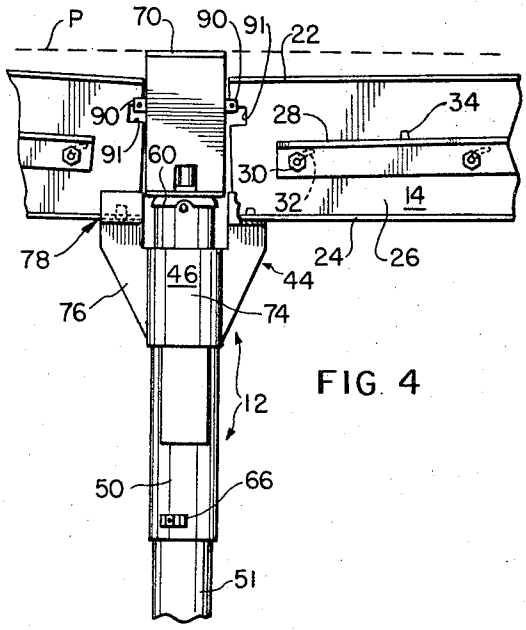


FIG. 4

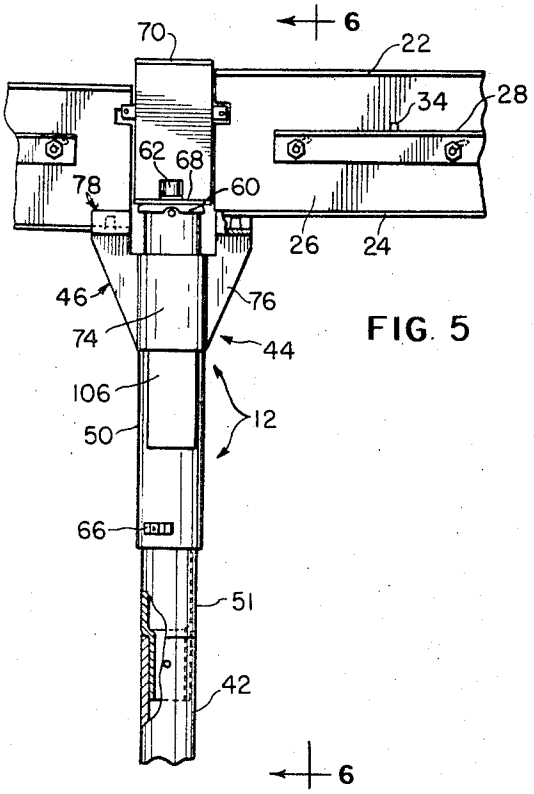


FIG. 5

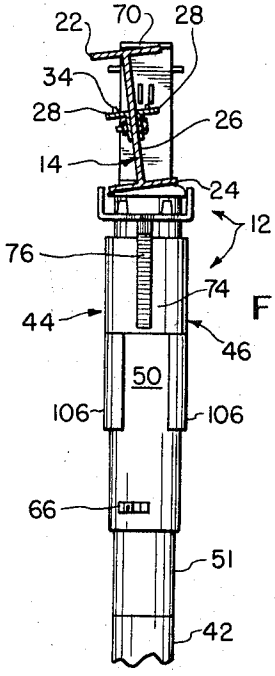


FIG. 6

INVENTORS.
GEORGE F. BOWDEN
RICHARD T. DAGIEL
By Norman Pearlstein

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FIG. 7

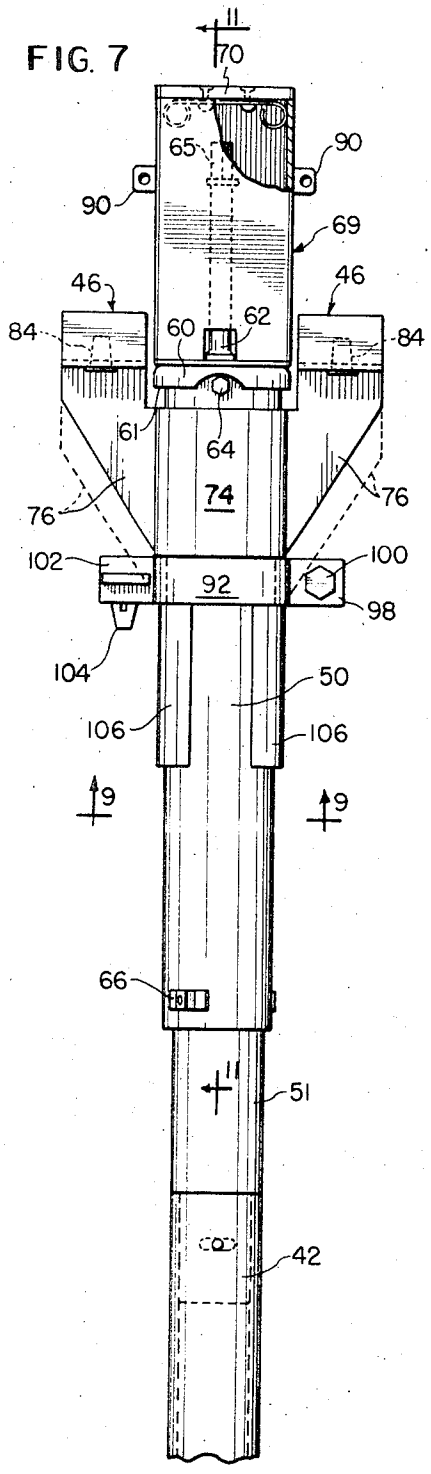


FIG. 8

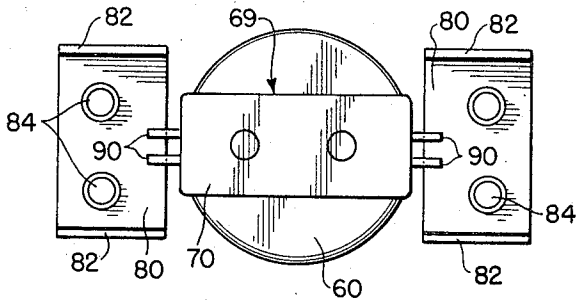


FIG. 9

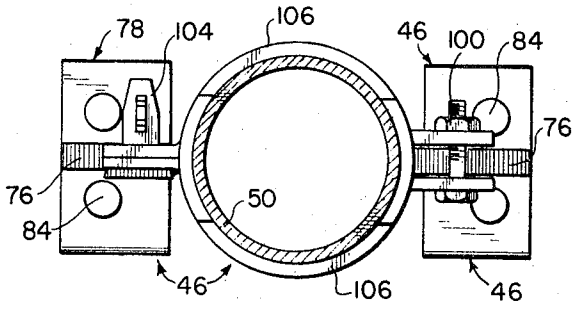
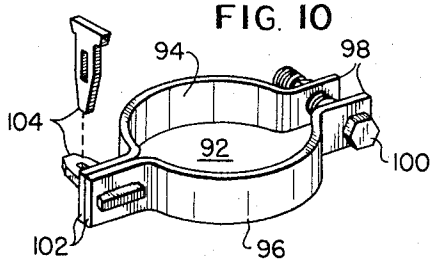


FIG. 10



INVENTORS.
GEORGE F. BOWDEN
RICHARD T. DAGIEL
By Norman Gerlach

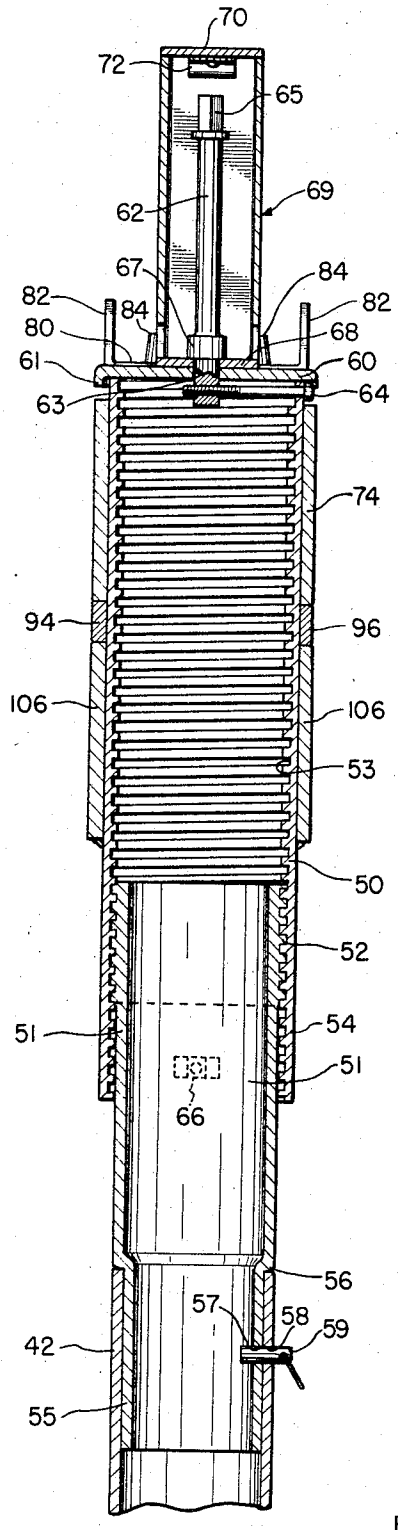
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FIG. 11



INVENTORS.
GEORGE F. BOWDEN
RICHARD T. DAGIEL
By Norman Perlack

United States Patent Office 3,430,910
Patented Mar. 4, 1969

3,430,910

STRINGER-RELEASING SHORE ASSEMBLY FOR A CONCRETE SLAB FORM INSTALLATION

George F. Bowden, Northbrook, and Richard T. Dagiel, Elk Grove Village, Ill., assignors to Symons Mfg. Company, Des Plaines, Ill., a corporation of Delaware

Filed Feb. 6, 1967, Ser. No. 614,319
U.S. Cl. 248—354 2 Claims
Int. Cl. F16m 13/00

ABSTRACT OF THE DISCLOSURE

A supporting shore for a concrete slab, having a vertically shiftable stringer-supported member, which in its raised position, normally supports the stringer and associated panels during hardening of the concrete, and which, in its lowered position, releases the stringer so that the latter may be removed from beneath the slab at an early date and without waiting for the concrete to become fully hardened.

The present invention relates generally to concrete building construction and has particular reference to a novel shore assembly which is designed for use in releasably supporting a pair of adjacent horizontal stringers in their proper end-to-end relationship of alignment in a concrete floor slab form installation preparatory to and during a concrete pouring operation as well as after the concrete has been poured and up until such time as the concrete has become sufficiently set or hard that it is considered safe to remove the stringers.

Specifically, the shore assembly of the present invention is designed for use in connection with a system of concrete building erection which is known in the building industry as a "Slab-Shore System" and involves the use of several novel major items such as special shores and stringers for supporting in proper position the horizontal slab-forming panels of the system, and in addition, novel minor items such as supporting brackets, shore-to-stringer connections, grout seals, locking devices, fill-in pieces (where necessary) for making up either longitudinal or transverse odd dimensions, and special tools for installing and removing such minor items. This system of building erection is disclosed in, and forms the subject matter of, United States Patent No. 3,130,470, granted on Apr. 28, 1964 and entitled "Concrete Wall Form Installation."

The principle feature of a so-called "Slab-Shore System" as disclosed in the aforementioned patent resides in the ability progressively to remove localized groups of slab-forming panels as soon as the green concrete slabs thereon have gained sufficient strength to justify panel removal without having to resort to such prolonged curing of the concrete slabs as will enable the stringers and shores in the immediate vicinity to be removed for panel-releasing purposes. This panel-releasing feature of a "Slab-Shore System" is made possible by the use of a special form of stringer assembly having vertically movable ledge-type supporting members which are adapted to have the ends of the horizontal slab-forming panels rest thereon and are capable of being lowered or dropped throughout a limited vertical extent in order to afford sufficient clearance that the panels may be taken from the installation or system

without necessitating relief of the supporting pressure which is exerted by the stringers and shores upon the superjacent concrete slabs. In this manner, the usual period, sometimes amounting to as much as ten days, during which the concrete must remain supported before panel removal can be effected has been shortened to a matter of twenty-four hours in many instances and, at the most, forty-eight hours. The particular panel releasing stringer which has resulted in such early release of the slab-forming panels is disclosed in, and forms the subject matter of, United States Patent No. 3,052,008, granted on Sept. 4, 1962 and entitled "Panel-Supporting Stringer Assembly for a Concrete Floor Slab," the application for such patent having been filed as a division of the application for said Patent No. 3,130,470. A suitable stringer supporting shore assembly for use in a "Slab-Shore System" is disclosed in, and forms the subject matter of, United States Patent No. 3,130,950, granted on Apr. 28, 1964 and entitled "Shore Assembly for Concrete Floor Slabs," the application for such patent having been filed as another division of the application for aforesaid Patent No. 3,130,470.

The stringer supporting and releasing shore assembly of the present invention is similar in its purpose to that of said Patent No. 3,130,950 in that it serves as a medium for releasably supporting the associated stringers in end-to-end relationship. It differs, however, from the shore assembly of the last mentioned patent in that is makes possible the removal of the two associated stringers at an earlier time than has heretofore been possible, such time being coincident with the time when the concrete has become sufficiently cured as to justify removal of the stringers, the removal taking taking place without necessitating relief of the supporting pressure that is exerted by the shore assembly.

Heretofore, when large area concrete floor slabs are concerned, it has been possible to effect a progressive release of localized groups of stringers by first withdrawing the shore assemblies which support them and then, immediately thereafter, positioning the assemblies back in place for further slab supporting purposes. Alternatively, auxiliary temporary shore-type supports have been applied in the vicinity of those to be removed for stringer-releasing purposes. Not only do such procedures involve high labor costs, but the temporary and progressive removal of the shore assemblies as well as permanent removal of the stringers places an undue and premature stress upon the concrete which has not yet attained full strength and frequently results in the creation of small hair-like cracks and other regions of weakness which permanently weakens the floor slab undergoing formation.

The "Slab-Shore System" to which reference has heretofore been made and which is comprehended by aforementioned Patent No. 3,130,470 employs shore assemblies (see said Patent No. 3,130,950) having special means whereby they may interlock with the ends of the adjacent stringers which they support. However, the shore assembly of said Patent No. 3,130,950 makes no provision for releasing the two stringers which it supports except by withdrawal thereof from the concrete slab form installation.

The novel stringer-releasing shore assembly of the present invention is designed as an improvement over the

shore assembly that is shown and described in all three of the aforementioned patents in that it is provided with drop-type supports or ledges which interlock with the adjacent ends of the associated stringers in the same manner as the shore assembly over which it is designed as an improvement, but which, when lowered or dropped throughout a limited degree, afford the necessary clearance for removal of the stringers from which, of course, the associated slab-forming panels have previously been removed. The shore assembly of the present invention thus extends the usefulness of the "Slab-Shore System" which is shown and described in said Patent No. 3,130,-470. The provision of such a shore assembly constitutes the principal object of the present invention.

Numerous other objects and advantages of the invention, not at this time enumerated, will readily suggest themselves as the nature of the invention is better understood from a consideration of the following detailed description or specification.

In the accompanying five sheets of drawings forming a part of this specification, one illustrative embodiment of the invention is shown.

In these drawings:

FIG. 1 is a fragmentary top perspective view of a typical concrete floor slab installation involving the formation of a horizontally disposed concrete floor slab, such view showing a number of the stringer releasing shore assemblies of the present invention operatively in use in the installation;

FIG. 2 is an enlarged fragmentary perspective view illustrating, in exploded fashion, one of the improved shore assemblies and its two associated horizontal stringers;

FIG. 3 is a fragmentary side elevational view showing the shore assembly of FIG. 2 with the adjacent end regions of the two associated and aligned stringers operatively installed thereon;

FIG. 4 is a fragmentary side elevational view similar to FIG. 3 but showing the stringer-supporting cradle member in its lowered or dropped position preparatory to removal of the associated stringers from the concrete floor slab form installation;

FIG. 5 is a fragmentary side elevational view similar to FIG. 4 but illustrating the manner in which one of the associated stringers is released from the shore assembly after dropping of the vertically movable stringer-supporting cradle member;

FIG. 6 is a vertical sectional view taken on the line 6—6 of FIG. 5;

FIG. 7 is an enlarged fragmentary side elevational view of the improved shore assembly constituting the present invention;

FIG. 8 is a top plan view of the shore assembly of FIG. 7;

FIG. 9 is an enlarged horizontal sectional view taken on the line 9—9 of FIG. 7;

FIG. 10 is an exploded perspective view of the two-part separable clamp assembly that is employed in connection with the present invention; and

FIG. 11 is an enlarged vertical sectional view taken on the line 11—11 of FIG. 7.

Referring now to the drawings in detail and in particular to FIG. 1, there is disclosed in this figure a typical concrete floor slab installation involving the horizontal supporting surface for a concrete floor slab resulting from the pouring of wet concrete on such surface. The entire installation is designated in its entirety by the reference numeral **10** and involves a series of laterally spaced, vertically disposed shore assemblies **12** which embody the present invention and will hereinafter be referred to simply as "shores." The upper ends of these shores serve to support a plurality of series of longitudinally extending, horizontal stringers **14** and such stringers, in turn, support a plurality of series of transversely disposed, horizontal slab-forming panels **16**, the end edges of the latter resting on, and being supported by, the stringers.

The floor slab which is formed by pouring concrete on the upper planar surface that is afforded or formed by the panels **16** and also by the uppermost portions of both the shores **12** and the stringers **14** may, for example, constitute the first poured lowermost slab of a vertical series of vertically spaced, superimposed slabs subsequently to be poured in a multi-story building structure, the various slabs forming the bases for the floor and ceiling installations of the building. In such a case, the shores **12** will be set up in the usual manner of shore installation on sills or other supporting elements which are positioned on the ground or other foundation surface and serve to prelocate the various vertically disposed shores. If the supporting surface that is represented by the upper faces of the panels **16** is for the purpose of receiving poured concrete to produce one of the upper floor slabs, then the aforementioned supporting elements will be installed on the last formed concrete floor slab. It will be understood that the various shores **12** may be cross-braced in any suitable manner by struts or the like, such cross-bracing being omitted herein since it forms no part of the present invention.

The concrete floor slab installation **10** is merely illustrative of a typical installation in which the shores **12** are arranged in three spaced apart, longitudinally extending rows and with the panels **16** having their own longitudinal direction extending transversely of the installation between the adjacent parallel stringers **14**. The panels **16** are conventional, reuseable, prefabricated "Steel-Ply" panels of the type which is shown and described in the three aforementioned patents. Such panels are manufactured and sold by Symons Mfg. Company of Des Plaines, Illinois and are in the form of shallow rectangular box-like structures of tray-like design. Each panel includes a plywood facing **18** which is bounded by marginal studding **20** in the form of a rectangular steel frame. The stringers **14** are also of special design and are manufactured and sold by said Symons Mfg. Company, each stringer being in the form of an I-beam (see FIG. 2) including a horizontal top flange **22**, a horizontal bottom flange **24** and an interconnecting vertical web portion **26**. Movably supported on opposite sides of the web portion of each stringer **14** are two ledge-type, panel-supporting members in the form of anglepieces **28** (see FIGS. 2 to 6, inclusive) which are normally held in the raised position in which they are shown in FIG. 3 but which are capable of being lowered to the position in which they are shown in FIGS. 4, 5 and 6 for panel releasing purposes. Nut and bolt assemblies **30** which ride in arcuate slots **32** in the web portions **26** of the stringers **14** are provided for clamping the angle pieces **28** in their raised or panel-supporting position. Raised or upstanding protuberances **34** on the horizontal flanges of the anglepieces **28** normally lie behind the lower rim portions of the end parts of the studding **20** when said end parts rest on the anglepieces, and prevent endwise shifting of the panels when the anglepieces are in their lowered positions. In FIG. 2, the panels **16** have been omitted in the interests of clarity since the present invention relates to the novel construction of the shore **12** and to the novel releasable interlock connection between the shore and the adjacent ends of the two stringers **14** which are associated therewith and supported thereby. It will be understood, however, that when the panels **16** are operatively installed upon the stringers **14** in the concrete floor slab installation as shown in FIG. 1, the upper concrete-receiving surfaces of the plywood facings **18** will lie in a common plane which passes through the extreme flat upper ends of the shores **12** and through the upper flanges **22** of the stringers **14**, all in the manner set forth in detail in the three aforementioned patents. This common plane which defines the underneath surface of the poured

concrete floor slab is indicated by the dotted line P in FIG. 4.

Referring now to FIGS. 2 to 10, inclusive, and in particular to FIG. 2, the improved shore assembly or shore **12** of the present invention involves in its general organization an adjustable base part which is comprised of any desired number of telescopic tubular sections, two such sections being shown at **40** and **42** (FIG. 1); and an upper part in the form of a shore head **44**. The shore **12** is similar in many respects to the shore assembly of aforementioned Patent No. 3,130,950, is similarly disposed in the concrete floor slab installation **10**, and differs from the earlier shore assembly solely in the construction of the shore head **44**. Whereas the shore head of the earlier shore assembly makes no provision for releasing the stringers **14** with which it is associated, the present shore head **44** is provided with a vertically shiftable stringer-supporting cradle member **46** which, when in the elevated position in which it is shown in FIGS. 2 and 3, serves to maintain the stringers in their operative panel-supporting position and, when in the lowered position in which it is shown in FIGS. 4, 5 and 6, allows the stringers to be removed from beneath the partially cured, but nevertheless self-supporting, superjacent concrete floor slab.

The shore head **44** is comprised of but relatively few parts and these include the aforementioned vertically movable cradle member **46** (see FIGS. 7, 8 and 9), a rotatable tubular body portion **50**, and an inner extensible and retractible post section **51** which, in effect, constitutes an uppermost shore section in that it seats upon the section **42** of the adjustable base part of the shore. The upper end region of the post section **51** is provided with an external screw thread **52** for mating engagement with an internal screw thread **53** which is formed on the inner periphery or surface of the body portion **50** and is coextensive therewith. The externally threaded upper end region of the post section **51** is of slightly increased diameter so that when the post section is threaded into the rotatable tubular body portion **50** an appreciable distance there will be an overhang of the internal screw thread **53**, thus establishing on the body portion a depending apron **54** which encompasses and is slightly spaced from the cylindrical side wall of the post section **51**. The lower end of the post section **51** is formed with a reduced pilot section **55** (see FIG. 11) which projects into the upper end of the shore section **42** and establishes a downwardly facing annular shoulder **56** which seats on the upper rim of said shore section **42**. A hole **57** in the pilot section **55** of the post section **51** registers with a hole **58** in the shore section **42** and both of these holes are adapted when in registering relation to receive therein a conventional fastening pin **59** (see FIG. 11) which prevents relative turning movement of the post section **51** and the shore section **42**.

From the above description, it will be apparent that by rotating or turning the body portion **50** in one direction or the other with respect to the fixed post section **51**, elongation or shortening, as the case may be, of the shore **12** as a whole may be effected. The upper end of the body portion **50** is provided with a combined end closure and bearing plate **60**, the rim portion of which extends downwards and overhangs the upper end of the body portion **50** as indicated at **61** for a purpose that will be made clear presently. A vertically disposed elevation post **62** has its lower end projecting through a hole **63** which is centrally formed in the combined end closure and bearing plate **60** and is fixedly secured for rotation bodily with the body portion **50** by means of a horizontal through bolt **64** which projects diametrically across the upper end of said body portion and passes through the lower end of the post **62**. The upper end of the elevation post **62** is squared as at **65** for reception of a suitable torque-applying tool such as a wrench by means of which the post, and consequently, the body portion **50**, may be turned as a unit, thus making it possible to effect a relatively fine adjustment of the height of the body portion for slab-levelling purposes, the adjustment being made by a workman operating from above the panels **16**. A similar adjustment may be made by a workman operating from below the level of the panels by reason of three torque brackets **66** which are welded to the lower end region of the body portion **50**, these brackets being capable of cooperation with a suitable torque tool such as a spanner wrench or the like (not shown).

The elevation post **62** is provided with a radial flange **67** a short distance above the level of the combined end closure and bearing plate **60** and this flange constitutes a limit stop for a rotatable bearing shoe plate **68** through which the lower end portion of the post loosely projects. Such bearing shoe plate rests on the combined end closure and bearing plate **60** and constitutes a bottom closure plate for a tubular upstanding box-like housing **69** which is of rectangular configuration in cross section and encloses or houses the elevation post **62**. The rectangular upper rim of the housing **69** is open and is adapted to be closed by a removable slab-supporting filler plate **70** which is adapted to rest upon the upper rim of the housing **69** and lie within the common plane P (FIG. 4) which, as previously stated, defines the underneath surface of the concrete floor slab undergoing formation. Spring fingers **72** serve releasably to retain the filler plate **70** in position at the top of the shore assembly. When said filler plate is removed, access is provided to the upper squared end of the elevation post **62**.

The cradle member **46** is essentially a unitary structure and is comprised of welded parts including a central sleeve member **74**, two triangular webs **76** which project radially outwardly from the sleeve member on opposite sides thereof, and a pair of cradles proper **78** (see FIGS. 2 and 7) which are carried at the upper ends of the webs **76**. Each cradle proper **78** is in the form of a short length of channel stock and consists of a horizontal bottom plate **80** and upstanding side flanges **82**. Two upwardly tapered posts **84** in the form of rivet shanks project upwardly from the bottom plate **80** of each cradle proper and are adapted to receive thereover cooperating holes **86** which are formed in the adjacent end portion of the bottom flange **24** of the adjacent or associated stringer **14**, that is, the particular stringer which is supported by said cradle proper. Pairs of closely spaced ears **90** project outwardly from the opposite sides of the housing **69** and are adapted to receive therebetween the adjacent extreme end edge portions of the vertical web portions **26** and the stringers **14**. Notches **91** are cut in these extreme end edge portions of the web portions and serve a function which will be made clear presently.

The central sleeve member **74** of the cradle member **46** loosely surrounds the body portion **50** of the shore head **44** and is vertically shiftable on said body portion between the raised or elevated position wherein it is shown in FIGS. 2, 3 and 11, and the lowered position wherein it is shown in FIGS. 4, 5 and 6. Said central sleeve member **74** is adapted to be releasably supported in its raised position by means of a two-part separable clamp assembly **92**, the details of which are clearly shown in FIG. 10. Such clamp assembly comprises arcuate counterpart sections **94** and **96** having at certain opposed ends thereof mating ears **98** which are capable of connection by a nut and bolt assembly **100**, and having at their other opposed ends similar mating ears **102** which are capable of connection by a conventional wedge and bolt assembly **104**. The clamp assembly **92** thus assumes the form of a two-part separable collar which is adapted to surround the body portion **50** of the shore head **44** immediately below the lower end of the sleeve member **74** when the latter is in its raised position and the lower edge of the clamp assembly is supported on the upper edges of two reaction plates **106** which are welded to the outside face of said body portion **50** of the

shore head **44** in diametrically disposed relationship. Upon removal of the clamp assembly **92** as shown in FIGS. 4, 5 and 6, the sleeve member **74** and its associated parts will fall by gravity to its lowered position and come to rest upon the upper edges of said two diametrically disposed reaction plates **106**.

Referring now to FIGS. 3 to 6, inclusive, wherein the manner in which the shore assembly **10** of the present invention is manipulated in order to release the associated stringers **14** from any given concrete floor slab installation such as that illustrated in FIG. 1, the disclosure of FIG. 3 represents the condition of one of the shore assemblies or shores **12** when it is in its operative position beneath a poured floor slab which has hardened sufficiently to justify removal of the two associated aligned stringers **14** which it serves to support. The ends of the slab-forming panels **16** are shown as being operatively supported on the anglepieces **28** and the adjacent ends of the stringers **14** are held in position by the ears **90** which straddle the web portions **26** of the stringers. The notches **91** are slightly above the level of the ears **90** and, thus, are consequently out of register therewith so that the ears maintain the stringers against lateral shifting. The clamp assembly **92** is disposed on the short head **44** and rests upon the two welded-in-place reaction plates **106** so that the vertical movable cradle member **46** is maintained in its upper position and holds the two adjacent stringers in their operative slab-supporting relationship with the top flanges **22** thereof at slab level as previously described. The filler plate **70** is in position within the rim region of the box-like housing **69** and likewise is at slab level. The anglepieces **28** are in their raised position to hold the panels **16** in slab-supporting relationship with their plywood facings **18** at slab level.

It will be understood that, in accordance with Symons Mfg. Company's "Slab-Shore System" as shown and described in aforementioned Patent No. 3,130,470, after the freshly poured concrete slab has become sufficiently set or hard to justify removal of the panels **16**, the time required being a matter of approximately twenty-four hours under favorable conditions, the anglepieces **28** will be lowered to release the panels and permit their withdrawal from the installation. Thereafter, when the concrete of the slab has become further hardened so as to justify removal of the stringers, the vertically shiftable or movable cradle member **46** is manipulated to release the stringers. The manipulation of the cradle member is illustrated in FIG. 4 wherein the two-part separable clamp assembly **92** has been removed from the shore head **44** so that the cradle member **46** assumes its lowermost position with the lower rim of the tubular body portion **50** resting directly on the upper horizontal edges of the two aforementioned welded-in-place reaction plates **106**. With the cradle member thus lowered, the adjacent ends of the stringers **14** likewise are lowered but the level of the tubular box-like housing **69** remains undisturbed and the filler plate **70** continues to lend the necessary support to the concrete slab. It will be observed that with the adjacent ends of the stringers **14** thus lowered as shown in FIG. 4, the level of the notches **91** is slightly below the level of the ears **90** so that these ears continue to straddle the web portions **26** of the stringers and maintain the latter against lateral shifting. The upstanding posts **84** continue to prevent axial or longitudinal shifting of the stringers so that the latter remain captured, so to speak, against involuntary dislodgement from the concrete floor slab installation.

The next step in the stringer-removal operation is for the operator or operators to raise the level of the adjacent ends of the stringers **14** until the notches **91** and ears **90** are in horizontal register with one another. Such a condition is illustrated in the right half of FIG. 5. At this time, the level of the bottom flanges **24** of the stringers is slightly above the level of the posts **84** so that by causing the stringers to become laterally inclined as shown in FIG. 6, the web portions **26** of the stringers will move away from the ears **90**. Thereafter, the stringers may be lifted from the cradles proper **78** and thus freed from the concrete floor slab installation. It will be understood that at the remote or far ends of the stringers **14** in the vicinity of the next adjacent shore assemblies in the installation, a similar stringer-releasing operation will either be effected simultaneously or it will have previously been resorted to so that the stringers **14** will have substantially complete freedom of movement in the manner outlined above.

From the above description, it will be appreciated that by means of the present shore assembly with its vertically shiftable cradle member **46**, the shoring support for the superjacent concrete floor slab is at no time disturbed. The solid column of metal extending from the floor or base foundation surface upwardly through the various shore sections **40** and **42**, the post section **51**, the tubular body portion **50** of the shore head **44**, the tubular box-like housing **60**, and the filler plate **70** remains at all times effective to support the slab. No temporary or auxiliary shoring is required and the original shoring part of the installation remains effective to support the floor slab during early panel-removal operations and subsequent stringer-removal operations.

The invention is not to be limited to the exact arrangement of parts shown in the accompanying drawings or described in this specification as various changes in the details of construction may be resorted to without departing from the spirit or scope of the invention. For example, it is within the purview of the present invention to dispense entirely with the elevation post **62** and, otherwise, to make no provision for slight adjustments of the floor slab. If desired, the drop-cradle construction which constitutes the subject matter of the present invention may be embodied in a simplified form of shore assembly consisting simply of a single shore post, or a sectional shore post, the drop-cradle being operatively installed on the same in the upper regions thereof. Therefore, only insofar as the invention is particularly pointed out in the accompanying claims is the same to be limited.

Having thus described the invention what we claim as new and desire to secure by Letters Patent is:

1. A stringer-supporting shore comprising an elongated generally cylindrical post adapted to be positioned vertically in a concrete floor slab installation with its lower end supported on a foundation surface and its upper end in slab-supporting relationship, a cradle member movably mounted on said post in the upper region thereof for limited vertical displacement between a raised and a lowered position, said cradle member comprising a tubular sleeve loosely encircling the post and a pair of stringer supports extending laterally from said tubular sleeve in opposite directions and adapted to receive thereon the adjacent end portions of a pair of aligned panel-supporting stringers, means on said post establishing an upwardly facing reaction shoulder upon which the lower rim of the tubular sleeve is normally adapted to rest to determine the lowered position of the cradle member, and a removable reaction member adapted for interpositioning between said lower rim of the tubular sleeve and said reaction shoulder and having an effective vertical width which establishes the raised position of the cradle member, said post being of a sectional nature and including an upper tubular non-rotatable section, a shore head on said upper section and comprising a rotatable tubular body portion telescopically and threadedly received over said upper section, an elevation post fixedly secured to said tubular body portion in coaxial relationship and projecting upwardly therefrom, the upper end of said elevation post being non-circular in transverse cross section for cooperation with a torque-applying wrench, a non-rotatable tubular housing coaxial with said rotatable

tubular body portion, encompassing said elevation post and slidably supported on the upper end of said body portion, and an imperforate filler plate removably closing the upper end of said tubular housing, said upwardly facing reaction shoulder being formed on the rotatable tubular body portion.

2. A stringer-supporting shore as set forth in claim 1 and wherein the removable reaction member is in the form of a generally circular, two-part, separable clamp adapted loosely to encircle said body portion above the level of said reaction shoulder with its lower rim opposing the latter and with its upper rim opposing the lower rim of the tubular sleeve.

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ROY D. FRAZIER, *Primary Examiner.*

J. FRANKLIN FOSS, *Assistant Examiner.*

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