Dec. 20, 1966 J. R. WILLIAMS 3,292,891

SHORE HEAD

Filed March 31, 1965 2 Sheets-Sheet 1

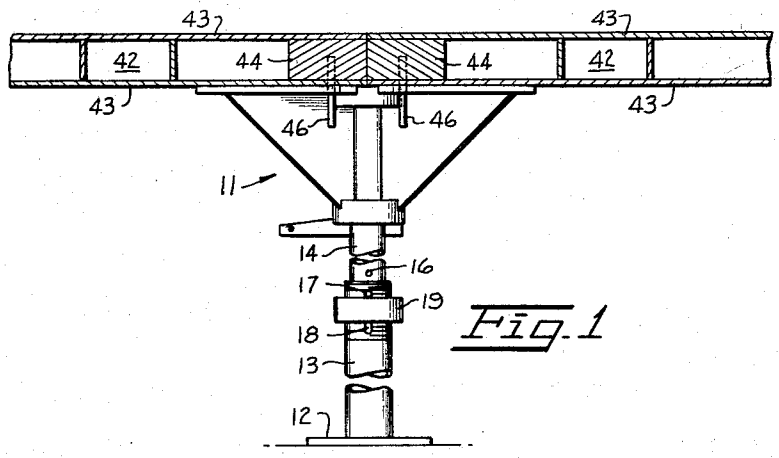


Fig. 1

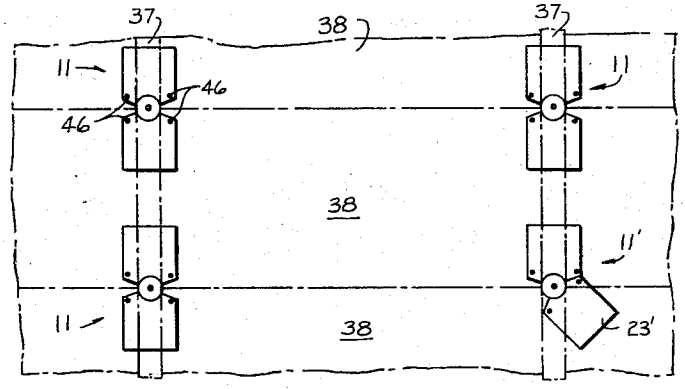


Fig. 2

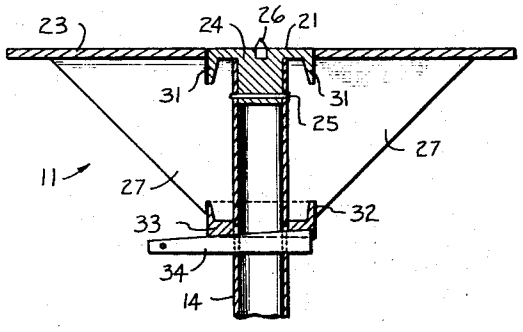


Fig. 3

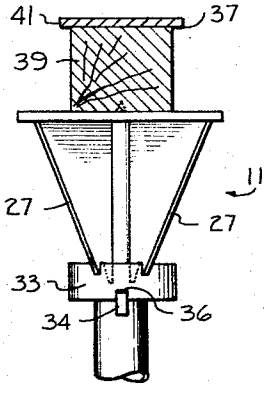


Fig. 4

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Dec. 20, 1966 J. R. WILLIAMS 3,292,891

SHORE HEAD

Filed March 31, 1965 2 Sheets-Sheet 2

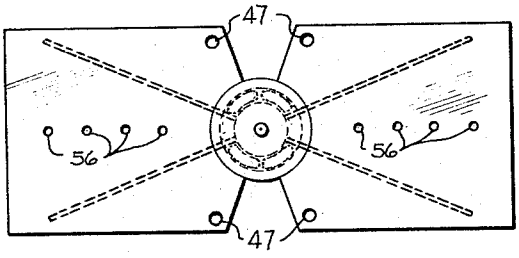


Fig. 5

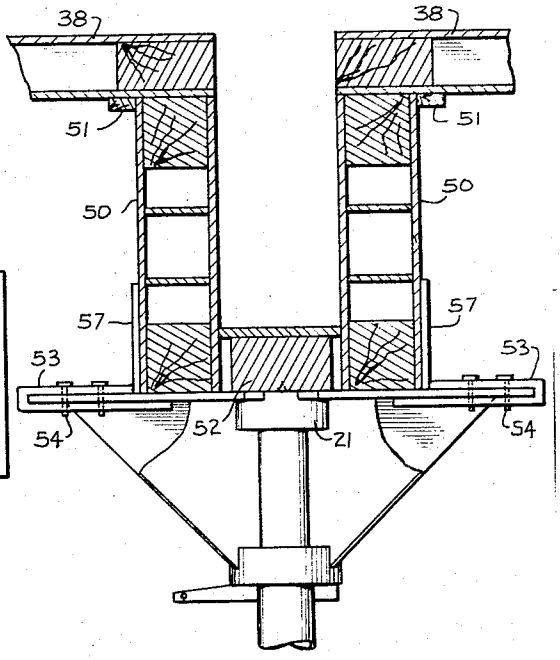


Fig. 7

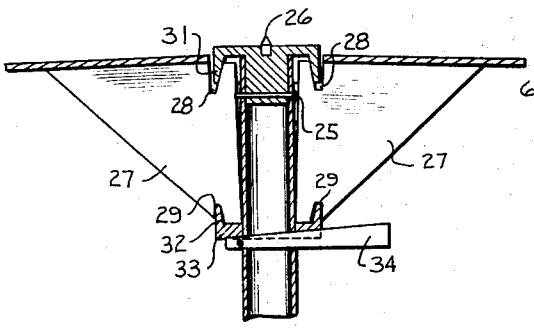


Fig. 6

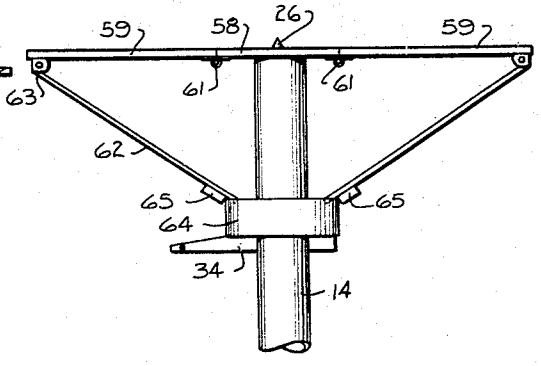


Fig. 8

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3,292,891

SHORE HEAD

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8 Claims. (Cl. 248—354)

This invention relates to shores and, more particularly, to an improved shore head for shores used to support concrete forms and the like.

As in knwon, floors and ceilings in many of today's buildings comprise reinforced concrete slabs. Such slabs are commonly formed in place. That is, a form structure of wood or steel is supported by shores directly beneath the area to have the floor or ceiling. Then, concrete is poured into the form structure to provide the desired slab.

The forms onto which the concrete is poured in the formation of a slab represent one of the larger expenses in the construction of the slab. Because these forms can generally be used many times, it is desirable to remove the forms from a slab as soon as possible after the pouring of the slab. This enables maximum utilization of the forms since the forms can then be used in the pouring of another slab, or the formation of other concrete structures.

Concrete form structures can generally be removed from a concrete pour before the concrete is fully set if other supporting structure is provided for the concrete during the remainder of the setting process. For example, with most cement mixtures commonly used, a form structure must be provided for approximately eight days on a freshly poured concrete slab of 4–5 inches thick. Thereafter, such forms can be stripped. However, other support, such as shored beams, must be provided for such a slab for another fifteen to twenty days.

Presently, the removal of a form structure from a slab, and the provision of other support in place thereof is relatively complex. That is, the shores holding up one section of a form structure must be removed and, thereafter, such section of the forms stripped from the slab. Beams or other support must be provided beneath the thus exposed section of the slab, and shores again provided to hold up such beams. Further sections of the form structure are similarly stripped and other supporting structure substituted therefor. This section by section operation, requiring unshoring and reshoring, is both time consuming and high in labor cost. For this reason, many contractors prefer to leave the form structure on the slab for the full duration of the setting process. In doing so, however, such contractors increase the number of form structures they require, or limit the amount of concrete construction they can have in process at one time.

Accordingly, it is an object of the present invention to provide a shore head for shores used in shoring concrete form structures and the like which facilitates early stripping of such a form structure from concrete.

Another object of the invention is to provide a shore head having a support member for abutting an object to be supported and in which a section of the support member is selectively movable out of shoring abutment with the object.

A further object of the invention is to provide a shore head having a support member which provides strong support for an object to be supported and yet has a section which is easily movable out of shoring engagement with such object.

Still another object of the invention is to provide a shore head which is of simple construction and which can be easily used by workmen.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawings accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawings and description may be adopted within the scope of the invention as set forth in the claims.

FIGURE 1 is an elevation view of a shore, shown broken, having a shore head of the invention in shoring relationship with a concrete slab form structure;

FIGURE 2 is a plan view of a plurality of shore heads of the invention in shoring relationship with a form structure

FIGURE 3 is a cross sectional view through the shore head of FIGURE 1 depicting particulars as to its construction;

FIGURE 4 is an end view of the shore head of FIGURE 1 depicting it with a concrete supporting beam thereon;

FIGURE 5 is a plan view of the shore head of FIGURE 1 further depicting particulars as to its construction;

FIGURE 6 is a cross section view similar to FIGURE 3 of the shore head and depicting it in a form releasing position;

FIGURE 7 is a partially broken away elevation view of the shore head of FIGURE 1 supporting a form structure for forming a concrete beam; and

FIGURE 8 is an elevation view of another shore head of the invention.

Conventional shores for supporting concrete slab forms and the like generally comprise an elongated load transmitting member or members having a base at one end and a load supporting shore head at the other. The length of the load transmitting member is usually adjustable so that the shore can provide shoring between many differently spaced objects. The shore head of the instant invention is adapted to replace the conventional shore head of such a shore. Generally, this shore head comprises a support member having a least two shoring abutment portions or sections. One of these abutment sections is selectively movable out of shoring abutment with an object being supported, while the other section remains in such shoring abutment. For the purpose of this description, the former section will be called a "movable" section, while the latter section will be called a "stationary" section.

A shore with a shore head of the invention need not be removed before forms can be stripped from a concrete slab and other support provided therefor. That is, support beams to support the concrete slab after the forms are removed can be incorporated into the form structure thereof when such form structure is assembled for the pouring of a slab. Shores having shore heads of the invention are arranged in shoring relationship to the resulting composite form structure with the stationary section of each shore head support member in shoring relationship to a support beam, and a movable section thereof in shoring relationship to a portion of the form structure that it is desired to be able to remove before the concrete is fully set.

After the concrete has hardened sufficiently to enable removal of the latter portion of the composite form structure, the movable section or sections of the shore head support members can be simply moved out of shoring engagement with and clear of such form structure portion, and the portion stripped from the concrete. During and after such stripping, the stationary section of each shore

head support member stays in shoring engagement with a support beam. It is therefore seen that it is unnecessary to remove the shores to strip all the form structure, except the support beams, from the concrete. Thus, the desired stripping of the concrete and provision of support therefor is readily accomplished. In fact, since the shores need not be removed at all, the stripping of the forms at this time is actually simpler than the ordinary stripping of forms at the very end of the setting process.

For a more particular description of the invention and its use with a preferred form structure, reference is now made to the drawings. In FIGURE 1 a shore head of the invention, generally indicated by the reference numeral **11**, is depicted on a conventional shore. Such shore comprises a base plate **12** having a first tubular load transmitting member or pipe **13** rigidly secured to and laterally extending from one face thereof. A second tubular load transmitting member or pipe **14** of a smaller diameter than the first pipe **13**, has one end telescopically extending within the free end of such first pipe. Pipe **14** has sets of diametrically opposed holes **16** therethrough spaced longitudinally along the pipe near its free end. A pin **17** extends through one set of such diametrically opposed holes and rides within a longitudinal slot **18** in pipe **13**. Pipe **13** is threaded adjacent its free end for the full length of slot **18**, and has a collar **19** threadably received thereon. Collar **19** is adapted to engage the ends of pin **17** and, upon rotation, move longitudinally of pipe **13** along the extent of slot **18**. Thus, by rotating collar **19**, pin **17** is moved longitudinally along slot **18** and the pipe **14** is thereby telescopically moved with respect to pipe **16**. In this manner, the height of the shore can be adjusted. If the desired height adjustment is greater than the length of the slot **18**, pin **17** can be removed from the set of holes **16** through which it passes, and pipe **14** moved telescopically in pipe **16** to approximately the desired height. At that time, pin **17** can be inserted through another set of holes **16** which are then aligned with slot **18**. Collar **19** is thereafter rotated to telescopically move pipe **14** to provide the desired height.

The shore as so far described is one type of conventional shore. It is to be appreciated that the shore head of the invention is not limited to such type of shore but, rather can be used on other types of shores.

The shore head **11** comprises a support member mounted on load transmitting pipe **14**. The support member includes a disk-shaped cap **21** and two laterally extending plates **23**. Cap **21** is the "stationary" support member section for shoring in abutting relationship to a support beam, and the plates **23** are "moveable" sections for shoring in abutting relationship to the portions of the form structure that are desirably stripped early from a concrete pour.

As shown in FIGURE 3 cap **21** is rigidly secured to the pipe **41**. That is, it has a stud portion **24** extending into the upper end of pipe **14**, and a pin **25** passing through such upper end and stud portion to secure them together. A tapered or sharpened pin **26** extends upward from the center of cap **21**. This pin will penetrate a support beam shored by cap **21** to assure that no undesired lateral movement of the shore with respect to the beam can occur.

Structure is provided to enable the support plates **23** to be rigidly held in immovable shoring abutment with an object to be supported, and yet be selectively moved easily out of such shoring abutment. More particularly, each of the support plates **23** has two triangularly shaped reinforcing web struts or plates **27** depending from the undersurface thereof. These web struts **27** are rigidly secured to their associated support plates **23** and extend longitudinally along pipe **14**. As best depicted in FIGURE 6, slots **28** and **29** extend into each of the strut webs **27** from its top edge and adjacent the bottom thereof, respectively. The slot **28** in each of the webs **27** is positioned just inwardly of the associated support plate **23**, and the slot **29** is in a corresponding position at the bottom of each web. Annular projections associated with pipe **14** extend within such slots to hold webs **27** and, thus each of the supporting plates **23**, to pipe **14**. That is, cap **21** has an annular projection **31** depending therefrom in engagement with the slot **28** of each of the reinforcing webs. Another annular projection **29**, which is on a collar **33** about pipe **14**, engages each of the slots **29**.

Collar **33** is longitudinally slidable on pipe **14** and, by being longitudinally moved, acts to provide the above stated rigid and movable positions of the support plates **23**. A wedge **34** passes laterally and diametrically through the pipe below the collar, and such collar rides upon the wedge. Wedge **34** is capable of lateral movement with respect to pipe **14** and, because of the configuration of such wedge, it is seen that upon such lateral movement, collar **33** is moved longitudinally of the pipe. A key groove **36** in collar **33** meets with and fits over wedge **34** to assure positive longitudinal movement of the collar upon movement of wedge **34**, without rotation of such collar. The collar **33** also has apertures **35** (depicted in dotted lines in FIGURE 5) in its bottom wall to provide drainage for any cement that might drop into such collar from the form structure to prevent the collar from being cemented to pipe **14**.

When wedge **34** is in the securing position depicted in FIGURE 3, i.e., with its larger end in engagement with the collar **33**, the collar is in its fully up position. The configuration of the slots **28**, **29** and the annular projections **31**, **32** are such that when the collar is in this up position, the reinforcing webs **27** are rigidly held against pipe **14** with each of the support plates **23** in abutment with the edge of cap **21** and with the upper surfaces thereof coplanar with the upper surface of such cap. More particularly with respect to the configuration of each of the slots **28**, **29**, the interior edge thereof closest to pipe **14** slopes inwardly away from such pipe. Further, the cross-sectional configuration of the projections **31** and **33** correspond to the configuration of the respective slots. Because of these configurations, movement of collar **33** upward draws reinforcing webs **27** inwardly against the pipe **14** and the plates **23** inwardly against cap **21**. It has been found that this arrangement provides very rigid securance of the support plates to the pipe **14**, and that when the plates are so rigidly secured, they are as effective as the cap **21** in supporting a load.

When wedge **34** is in the release position depicted in FIGURE 6, collar **33** is in its lowermost position and the webs **27** are just loosely held to pipe **14**. Such webs, together with the support plates **23**, can then be arcuately moved laterally about such pipe. That is, because of the configuration of slots **28**, **29** and of the annular projections **31**, **32**, when the collar is in its lowermost position, the webs **27** and support plates **23** can move slightly transversely away from the pipe **14** and cap **21**, respectively. Further, as can be seen in FIGURE 6, when the collar is lowered the support plates **23** drop vertically downward away from cap **21**. Thus, such plates are dropped out of shoring abutment with a structure being supported by the shore head and can be rotated about pipe **14** out of the way to permit lowering of a portion of such structure.

It is to be noted that the corners of the support plates nearest to cap **21** are beveled or mitered to permit such arcuate movement of each support plate without interference from the other support plate on each shore head.

As best depicted in FIGURE 4, each of the beams **37** includes a longitudinal runner member **39** having a concrete supporting face or sheet **41** of a suitable material such as plywood or the like secured to and covering its upper surface. The runner member **39** is at least substantially as wide as the cap **21** in order that such cap will only be supporting the beam and not the panels **38** when the shore is in shoring engagement with the form structure.

The panels **38** can be similar to types of form panels now utilized in the art. More particularly, such panels

can be rectangular and comprise a cellular structure 42 having stressed skins or faces 43 exteriorly thereon. Blocks 44 are provided in the ends of such panels whereat the panels are to be supported by the shore head.

In shoring the beams and panels of this form structur,e the shores are erected with the shore plates in the stationary or shoring positions. The beams 37 are aligned longitudinally of each shore as depicted in FIGURE 2 with the cap 21 of each shore in shoring abutment therewith. The tapered pin 26 on each of the caps 21 engages the beam thereon to assure that there is no relative lateral movement between the shore and the beam. The panels 38 are then laid between adjacent beams with the corners thereof supported by the support plates of the shore heads as shown.

Means are provided to hold the panels 38 in abutting relationship to the beams 37 and in abutting relationship with each other. That is, a removable pin 46 is provided in each of the panels 38 adjacent each of its corners. These pins extend into the blocks 44 and are removably secured therein by any suitable means known in the art.

Each of the pins 46 projects downward from its associated panel 38 and through a hole 47 in the support plate 23 therebelow. The position of the pins 42 adjacent the respective corners of the panels is so related to the holes 47 in the support plates that when the pins project through such holes, the panels are abutted against the support beams 37 and against each other as depicted in FIGURE 2.

The pins 46 can be used to facilitate proper abutment of the panels 38 to each other and to the beams 37 to provide a unitary, concrete receiving surface when the form structure is erected. More particularly, the panels 38 can be laid upon the shore heads before the pins are inserted into such panels. Then the pins 46 can be inserted from below through the plate holes 47 into the panels. When the pins are so inserted, they align the holes 47 with the pin receiving holes in the panels. By so doing, they bring the panels into tight firm abutment with the beams 37, and bring adjacent panels in tight firm abutment with each other.

The manner in which the panels 38 can be removed from a concrete slab poured on the form structure before the concrete is fully set without the necessity of removing the shores and then reshoring the support beams will now be described. The pins 46 are removed from the panels, and the wedge 34 of each shore head knocked to the position shown in FIGURE 6. This drops the support plates 23 of each shore head downward a short distance as shown in FIGURE 6 and thereby permits the panels 38 to break loose from the concrete slab. Movement of the wedge to the position shown in FIGURE 6 also released the plates to arcuately move laterally about the pipe 14. They are so arcuately moved, such as to the position in which the plate 23' of shore head 11' of FIGURE 2 is depicted, from beneath each panel to permit the panel to be lowered.

From the above, the speed and ease by which the panels are removed is readily apparent. Further, since the shore heads remains in shoring relationships to the support beams, the necessity of reshoring the support beams in supporting relationship to the concrete slab is obviated.

After the concrete is fully set, the shores can be removed from shoring engagement with the support beams in a conventional manner. That is, the collar 19 on pipe 13 of each shore can be rotated to lower pin 17, and hence telescope pipe 14 further into pipe 16. This lowers the cap 21 of each shore out of shoring engagement with the beam 37 thereabove.

Many concrete slabs are provided with reinformed concrete supporting beams running transversely on the underside of the slabs. Such beams are desirably formed integrally with the slab when the slab is formed. The shore head of the invention is also adapted to shore the form structure for such a beam, and permit the removal of forms therefrom before the beam is fully set. FIGURE 7 depicts a shore head in shoring engagement with a beam form structure. The form structure itself includes panels 50 which are vertically disposed to form the sides of the concrete beam. Each of the panels 50 has its upper edge in abutment with a panel 38 of the slab form structure slab. Means, such as lath strips 51 secured to the underside of the panels 38 along the top edge of the panels 50, are provided to prevent outward lateral movement of the tops of the panels 50. As depicted, the panels 38 are laterally spaced from one another the desired width of the concrete beam and their ends act as a form for the uppermost portion of such beam. A support beam 52 is provided to define the bottom face of the concrete beam.

The shore head of the invention is oriented transversely of the beam 52 in shoring relationship to the form structure. As depicted, the cap 21 of the shore head is in shoring abutment with the beam 52, and the support plates 23 are in shoring abutment with the panels 50.

Means are provided to prevent lateral outward movement of the bottom panels 51, and to hold such panels in abutment with the beam 52. That is, a bracket 53 is removably secured to each of the support plates 23 by means of pins 54 passing through holes 56 (see FIGURE 5) in such support plates. Each of the brackets has an upstanding abutment plate 57 integral therewith for abutment against a panel 50. Such abutment plates hold the panels 50 against the beam 52 and prevent lateral outward movement of the panels. As shown, a series of holes 56 are provided through each support plate to enable the securance of the brackets in various spaced positions for the formation of beams of different widths.

To remove the panels 50 from the concrete beam before it is fully set without the necessity of removing the shore, the brackets 53 are first disengaged from the support plates by removing the pins 54. Then the wedge 34 is knocked to its releasing position, and the support plates arcuately moved to permit lowering of the panels 50. This also permits lowering of the slab forming panels 38 positioned above the panels 50. The cap 21 stays in shoring relationship to the beam 52 and thus support is provided for the concrete beam until it is fully set.

Another embodiment of the invention is depicted in FIGURE 8. The cap 58 of the support member of this embodiment has a square configuration rather than the disc configuration of the cap 21 of the previously described embodiment. The support plates 59 are hingedly connected to the cap by hinges 61 for downward movement out of shoring abutment with an object being supported. In addition, a strut 62 is hingedy connected to the extremity of each support plate 59 by a hinge 63. The free end of each of the struts is adapted to be engaged by a collar 64 which can be identical to the collar 33 of the previously described embodiment. More particularly, a block projection 65 is welded or otherwise suitably secured to the undersurface of each of the struts 62 adjacent its free end. Each block 65 and the free end of each of the struts 62 form a notch to engage the rim of the collar 64. The other parts of this embodiment are identical to the corresponding parts of the earlier described embodiment and for this reason, are referred to by like numerals.

Where the collar 64 is in its uppermost position, as depicted, and with the struts 62 in engagement therewith, it rigidly holds the support plates 59 in shoring abutment with an object being supported. However, when the collar is in its lowermost position, i.e., when wedge 34 is in its releasing position, the struts 62 can be disengaged from the collar and swung outward to permit the support plates 59 to be swung downward. In this manner, such support plates are taken out of shoring abutment with an object being supported such as form structure panels to permit such object to be lowered.

It is to be appreciated that many modifications are possible within the scope of the invention. For example, the load transmitting pipe **14** could be of a square cross-section rather than circular. In addition, such load transmitting member could be a sleeve to fit over a load transmitting shore member, rather than be part of the shore itself.

What is claimed is:

1. A shore head for shores comprising a shore load transmitting member, a support member on said load transmitting member adapted to shoringly abut an object to be supported, said support member having at least two abutment sections, one of said sections being rigidly secured to said load transmitting member and the other of said sections comprising a pair of diametrically opposed members each being selectively movable with respect to the other of such members and to said load transmitting member out of shoring abutment with said object to be supported.

2. A shore head for shores comprising a shore load transmitting member, a support member on said load transmitting member adapted to shoringly abut an object to be supported said support member having at least two abutment sections, a first one of said sections being rigidly secured to said load transmitting member, the second one of said sections comprising a pair of diametrically opposed members each being selectively rotatably movable independently of the other with respect to said load transmitting member and selectively movable out of shoring abutment with said object being supported, and means interconnecting said load transmitting member and said diametrically opposed members for selectively maintaining rigid relationship therebetween.

3. A shore head for shores comprising a load transmitting member, a support member on said load transmitting member adapted to shoringly abut an object to be supported, said support member including a cap section rigidly secured at one end of said load transmitting member and two support plates adapted to extend laterally from said load transmitting member adjacent said cap section, said support plates being selectively and independently movable with respect to said load transmitting member out of shoring abutment with an object being supported, and web means interconnecting said load transmitting member with the under surface of each of said support plates for selectively maintaining rigid relationship therebetween with said support plates in shoring abutment with an object being supported.

4. The shore head of claim **3** wherein said means for selectively maintaining rigid relationship between said support plates and said load transmitting member includes a collar about said load transmitting member and longitudinally slidable thereon between first and second positions, and strut structure secured to each of said support plates and engageable by said collar, said collar and strut structure maintaining rigid relationship between said support plates and said load transmitting member when said collar is in said first position and engaging said strut structure, and enabling said selective movement of said support plates out of shoring abutment with an object being supported when in said second position.

5. The shore head of claim **4** wherein said means for selectively maintaining rigid relationship between said support plates and said load transmitting member further includes a wedge member passing laterally through said load transmitting member and in engagement with said collar, said wedge member being laterally movable with respect to said load transmitting member to effect longitudinal sliding of said collar on said load transmitting member between said first and second positions.

6. A shore head for shores comprising a shore load transmitting member, a first support member positioned at an end of said transmitting member and adapted to shoringly abut an object to be supported, a second support member carried on said transmitting member and extending diametrically from said transmitting member, said second member being movable from a first shoring position in which a shoring surface thereof is generally coplanar with said first support member to a second position out of shoring engagement, said second member having an edge portion generally normal to said shoring surface adapted to be urged into locking engagement with said load transmitting member, and means for selectively urging said edge portion into and out of said locking engagement.

7. The shore head of claim **6** in which said last named means includes a pair of oppositely directed slots extending generally parallel to said load transmitting member, an annular projection on said first support member engageable in one of said slots and a projection axially adjustably positioned on said load transmitting member engageable in the other of said slots.

8. The shore head of claim **7** wherein axial separation of said projections frees said second support member for rotation about said load transmitting member.

References Cited by the Examiner

UNITED STATES PATENTS

1,829,550	10/1931	Symons	248—357
1,842,683	1/1932	Markham	248—357
3,162,922	12/1964	Alziari	248—354

FOREIGN PATENTS

825,126	12/1959	Great Britain.

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