

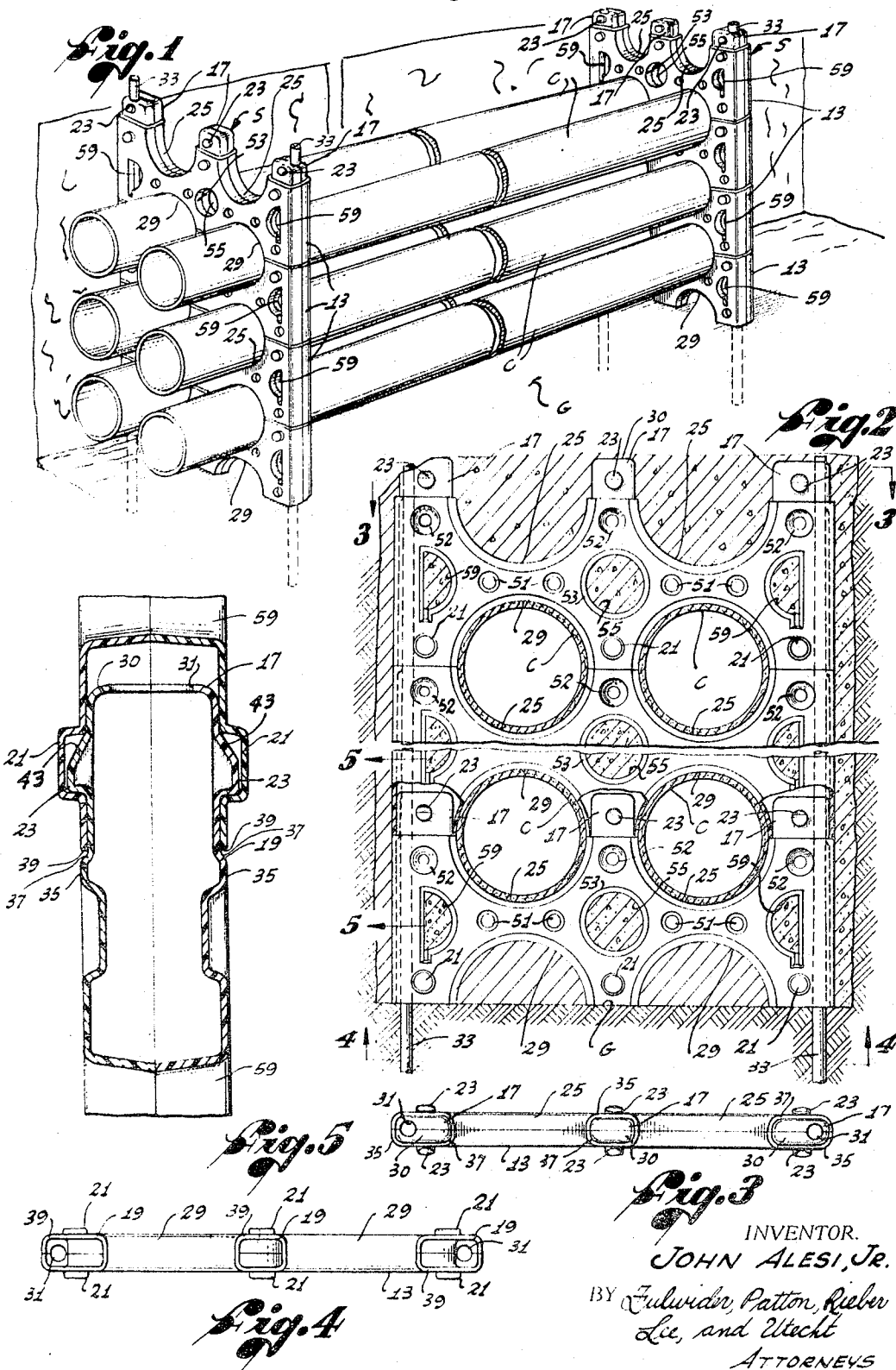
Sept. 2, 1969

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3,464,661

CONDUIT SPACER APPARATUS

Filed Aug. 15, 1967



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3,464,661

CONDUIT SPACER APPARATUS

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Filed Aug. 15, 1967, Ser. No. 660,636

Int. Cl. F161 3/22

U.S. Cl. 248—68

5 Claims

ABSTRACT OF THE DISCLOSURE

Conduit spacer apparatus including a hollow lower spacer, having an upwardly-facing depression for receiving the lower half of a conduit and a pair of upwardly extending tongues, one tongue being disposed on either side of the depression. Each of the tongues includes a button, the bottom side of which forms a downwardly facing latching surface. A hollow upper spacer is formed with a downwardly-facing depression for confronting the depression in the lower spacer and receiving the upper half of the conduit. The upper spacer includes a pair of receptacles complementally shaped to receive the respective tongues and each receptacle includes an upwardly facing latching surface for being engaged under the latching surface formed by the respective buttons. The walls forming the receptacles are sufficiently resilient to be bowed outwardly to clear the respective buttons when the tongues are inserted, and to spring inwardly to move the latching surfaces in the receptacles into latching engagement below the respective buttons.

BACKGROUND OF THE INVENTION

Field of the invention

The present invention relates generally to conduit spacer assemblies and more particularly to spacer assemblies that can be interlocked around a plurality of conduits to hold them securely in spaced relationship, and carry the weight of the elevated conduits in a vertical column of conduits without having the bottom conduit bearing the entire weight.

Description of the prior art

Known existing conduit spacer assemblies are comprised of a series of individual spacers, each of which rests on a respective conduit or series of conduits, resulting in the entire weight of a plurality of vertically stacked conduits being carried on the bottom conduits.

SUMMARY OF THE INVENTION

The conduit spacer apparatus of present invention includes hollow upper and lower spacers, such spacers including confronting depressions which are formed for receiving a conduit. The lower spacer includes an upwardly projecting tongue on either side of the depression formed therein, and such tongues include buttons which form downwardly-facing latching surfaces. The upper spacer includes downwardly opening tongue-receiving receptacles for receiving the respective tongues and each of the receptacles includes latching surfaces for engagement below the respective buttons. The walls of the receptacles are sufficiently resilient to be bowed outwardly to clear the respective buttons as the respective tongues are extended into the respective receptacles, and to urge the latching surfaces included in the receptacles into latching engagement below the respective latching surfaces defined by the respective buttons.

Other objects and the features of the invention will become apparent from consideration of the following de-

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scription taken in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view, partially broken away, of a series of conduit spacer assemblies embodying the present invention and supporting a plurality of conduits; FIG. 2 is a right end view, in enlarged scale and partially broken away, of the conduits and spacer assemblies shown in FIG. 1;

FIG. 3 is a top view, taken along the lines 3—3 of FIG. 2;

FIG. 4 is a bottom view, taken along the line 4—4 of FIG. 2; and

FIG. 5 is a partial sectional view, in enlarged scale, taken along the lines 5—5 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The spacer apparatus S shown in FIG. 1 is assembled to support six horizontally extending conduits C, in a trench formed in the ground G. Each of the individual spacers 13 are of identical construction and are formed with upwardly-projecting tongues, generally designated 17, and downwardly-opening tongue-receiving receptacles 19. The receptacles 19 are formed with outwardly pressed circular depressions 21 which receive complementary circular buttons 23 formed on the tongues 17. Thus, the individual spacers 13 can be assembled around the respective conduits C by inserting the tongues 17 into the receptacles 19 and, such tongues will be locked in position by mating of the buttons 23 with the depressions 21.

The spacers 13 are of generally hollow construction and may be made from a synthetic plastic, or any other suitable material. A preferable method for making the spacers 13 is disclosed in Patent No. 3,311,683, entitled Vacuum Forming Method and issued to Formex Manufacturing, Inc., Santa Monica, Calif. Referring to FIGS. 1 and 2, each of the spacers 13 is formed with a semi-circular upwardly-opening depression or cut-out 25 for receiving the lower half of a respective conduit C, and a downwardly-opening semi-circular depression 29 for receiving the upper half of a respective conduit C.

Each of the spacers 13 includes three of the upwardly-projecting tongues 17 and such tongues are closed on their top end 30, the two outside tongues including vertical bores 31 (FIG. 5) for passage of reinforcing rods 33. It is of particular importance that the tongues 17 are formed with a peripheral rim 35 that defines an upwardly-facing limiting surface 37 which abuts the downwardly-facing edge 39 defined by the end of the walls of the receptacles 19.

The walls of the receptacles 19 are sufficiently resilient to be bowed outwardly by the buttons 23 as the tongues 17 are being inserted into the respective receptacles 19. The buttons 23 include inclined surfaces 43, which slope downwardly and outwardly to define a wedging surface for urging the walls of the receptacles 19 outwardly as the tongues 17 are inserted into such receptacles.

As mentioned above, the spacers 13 are generally hollow, but the walls thereof are pressed inwardly toward one another at selected locations to form circular depressions 51, the central portions of these depressions being affixed together to provide structural reinforcement for the respective hollow spacers 13. Three circular reinforcing depressions 52 are formed in each wall of the spacers 13, near the top thereof, but these depressions are not deep enough for the opposed pairs to meet and be affixed to one another. The two end depressions 52 are in complementary spaced relationship with respect to the depressions 21 whereby when the spacers 13 are stacked for packaging the depressions 21 of each spacer 13 will fit into the de-

pressions 52 of a respective adjacent spacer 13. Referring to FIGS. 1 and 2, the respective opposite walls of each of the spacers 13 are pressed inwardly toward each other to form peripheral walls 53 which are joined intermediate the respective sides of the spacer 13 to form a structural reinforcement. The peripheral walls 53 define a hole 55 to provide for flow of concrete when concrete is poured around the conduits C and for projection therethrough of horizontal reinforcing rods if desired. A half-moon shaped hole 59, similar to hole 55, is formed near each edge of the spacers 13 for accepting a reinforcing rod and passage of concrete being poured around conduits C.

When the spacers 13 are assembled to support the conduits C, the bottom spacer will first be installed and then the bottom pair of conduits placed thereon. The vertical reinforcing rods 33 may be driven into the bottom of the conduit-receiving trench to assist in holding the spacer 13 upright. After the bottom pair of conduits C have been placed in position, the second spacer 13 is installed thereover by fitting the respective receptacles 19 over the respective tongues 17. It will be clear that as the receptacles 19 are fitted over the tongues 17, the walls of the receptacles will be pushed outwardly by the inclined surfaces 43 of the buttons 23 to enable the receptacles to slide downwardly over the tongues until the buttons 23 register with the button receiving depressions 21. Simultaneously, with registration of the buttons 23 with the depressions 21, the limiting surfaces 37 will abut the bottom edges 39 of the receptacles 19, and further downward movement of the second spacer will be resisted. Thus, a tight joint will be formed between the two spacers holding the lower pair of conduits captive. The middle pair of conduits C will then be brought into position cradled in the depressions or cut-outs 25 of the second spacer 13 and the third spacer 13 will be installed. This procedure may be repeated for as many rows of conduits C as is desirable.

Since the limiting surfaces 39 of each upper spacer 13 engages the limiting surfaces 37 of the respective adjacent spacer 13 to limit downward movement of the respective upper spacer, the spacer apparatus S will provide independent support for each of the individual conduits C without the weight of any one of such conduits being brought to bear on any of the other ones of such conduits.

For the foregoing it will be clear that the spacer apparatus of the present invention provides a novel and improved means for supporting conduits in spaced relationship while concrete is being poured therearound. The individual spacers are of unitary construction and convenient to install and provide for relatively inexpensive rigid support.

Various modifications and changes may be made with respect to the foregoing detailed description without departing from the spirit of the present invention.

I claim:

1. Conduit spacer apparatus for supporting a plurality of horizontal, elongated, vertically spaced conduits in spaced-apart relationship, and said apparatus comprising: a plurality of vertically aligned, hollow lower and upper spacers, each of said lower spacers being adapted for being disposed under one of said conduits and including an upwardly-opening recess complementally shaped to receive the lower portion of said one conduit, a first upwardly extending tongue disposed on one side of said recess, and including a button forming a downwardly-facing latching surface, a second

upwardly extending tongue disposed on the side of said recess opposite said one side and including a button forming a downwardly-facing latching surface, each of said upper spacers being adapted for being disposed over one of said conduits and including a downwardly-opening recess complementally formed to fit the contour of the upper portion of said conduit, a first downwardly opening receptacle complementally shaped to receive said first tongue and including an upwardly-facing latching surface for engaging under said latching surface included in said first tongue, a second downwardly-opening receptacle complementally shaped to receive said second tongue and including an upwardly-facing latching surface for engaging under said latching surface included in said second tongue, with the walls of said first and second receptacles being sufficiently resilient to be bowed outwardly to clear said buttons included in said respective first and second tongues, and to urge said respective latching surfaces formed in said first and second receptacles inwardly into latching engagement below said latching surfaces defined by said buttons formed in said first and second tongues, respectively; and

limiting surfaces formed on said upper and lower spacers which engage upon said latching engagement to limit downward movement of each of said upper spacers relative to the lower spacer immediately therebelow whereby independent support is provided for each of said conduits without the weight of any one of said conduits being brought to bear on any of the conduits spaced therebelow.

2. Conduit spacer apparatus as set forth in claim 1 wherein the side walls of said upper and lower spacers are formed with a plurality of opposed depressions, which define peripheral walls that are connected together on their proximate ends to provide structural reinforcement for said spacers.

3. Conduit spacer apparatus as set forth in claim 1 wherein said spacers are formed with complementary vertical rod-receiving passages.

4. Conduit spacer apparatus as set forth in claim 1 wherein a portion of the projecting ends of said buttons is inclined inwardly and upwardly to define a wedge to progressively engage and spread the walls of said respective receptacles as said first and second tongues are inserted into said respective first and second receptacles.

5. Conduit spacer apparatus as set forth in claim 4 wherein said depressions are formed with concrete-passing holes.

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U.S. Cl. X.R.

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