Feb. 17, 1953 M. A. GARRISON 2,628,403

COLLAPSIBLE FORM FOR CONCRETE CRYPTS

Filed Feb. 5, 1951 2 SHEETS—SHEET 1

Fig. 1

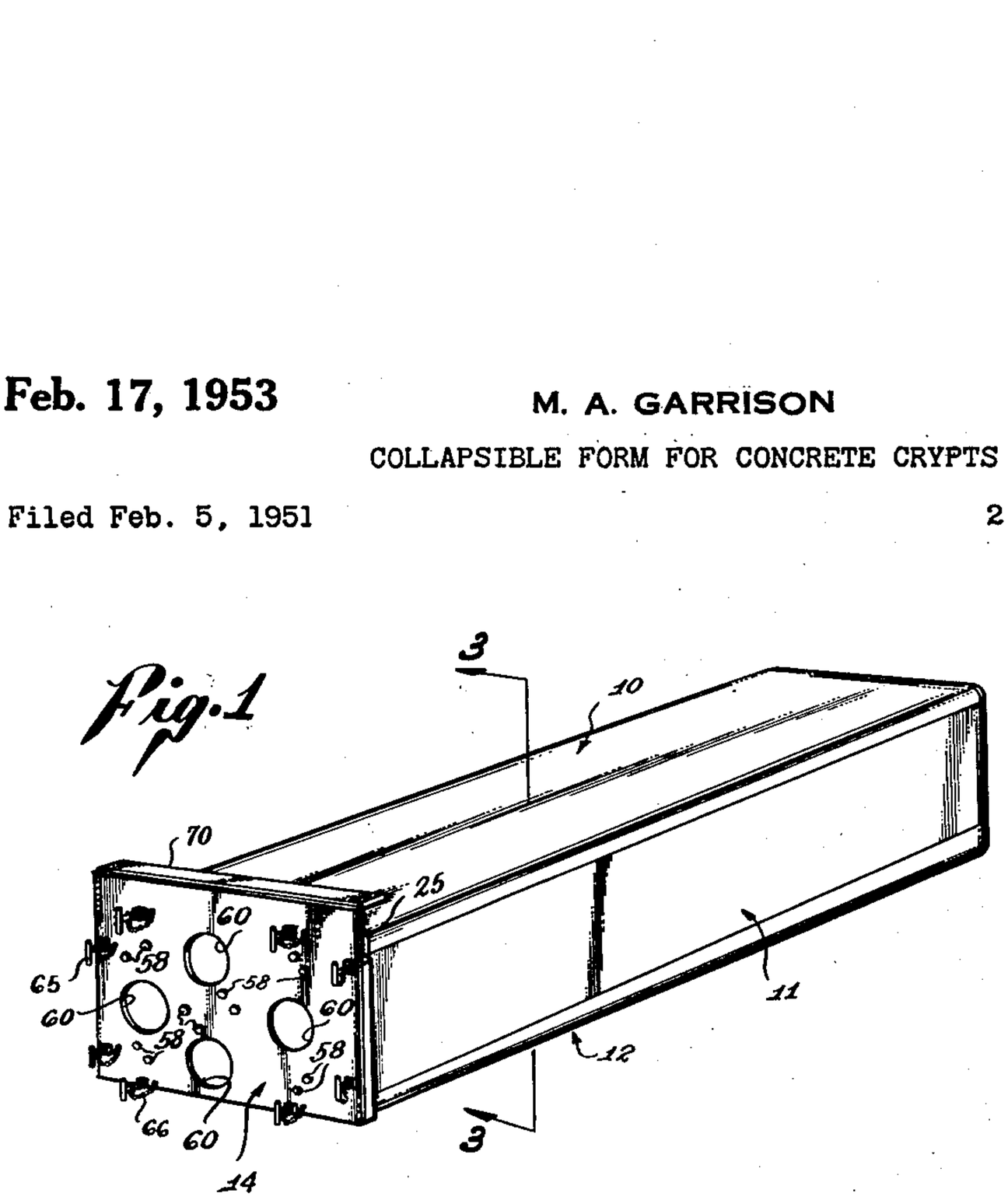
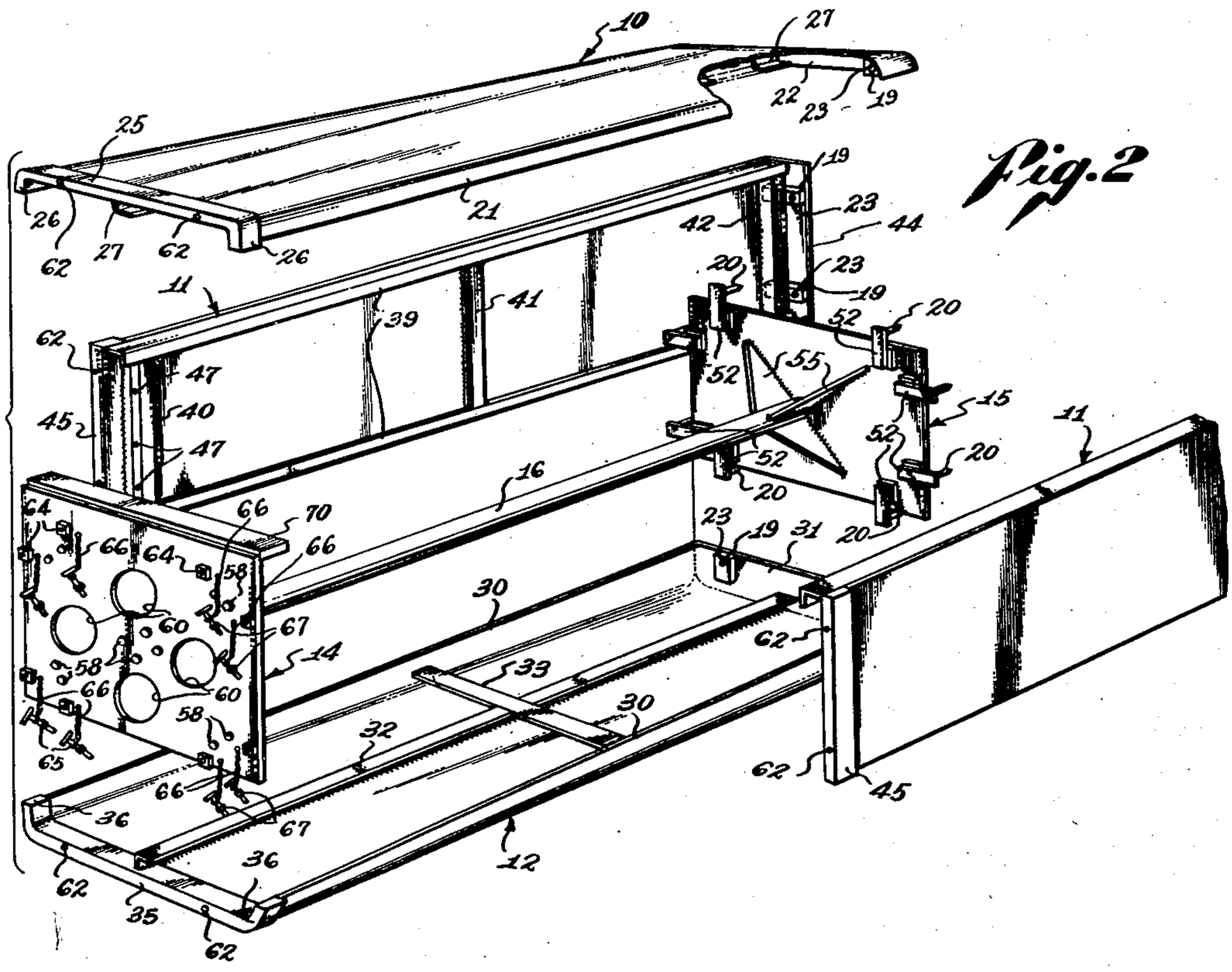


Fig. 2



INVENTOR.
MARION A. GARRISON
BY
Elwood V. Kendrick
Attorney

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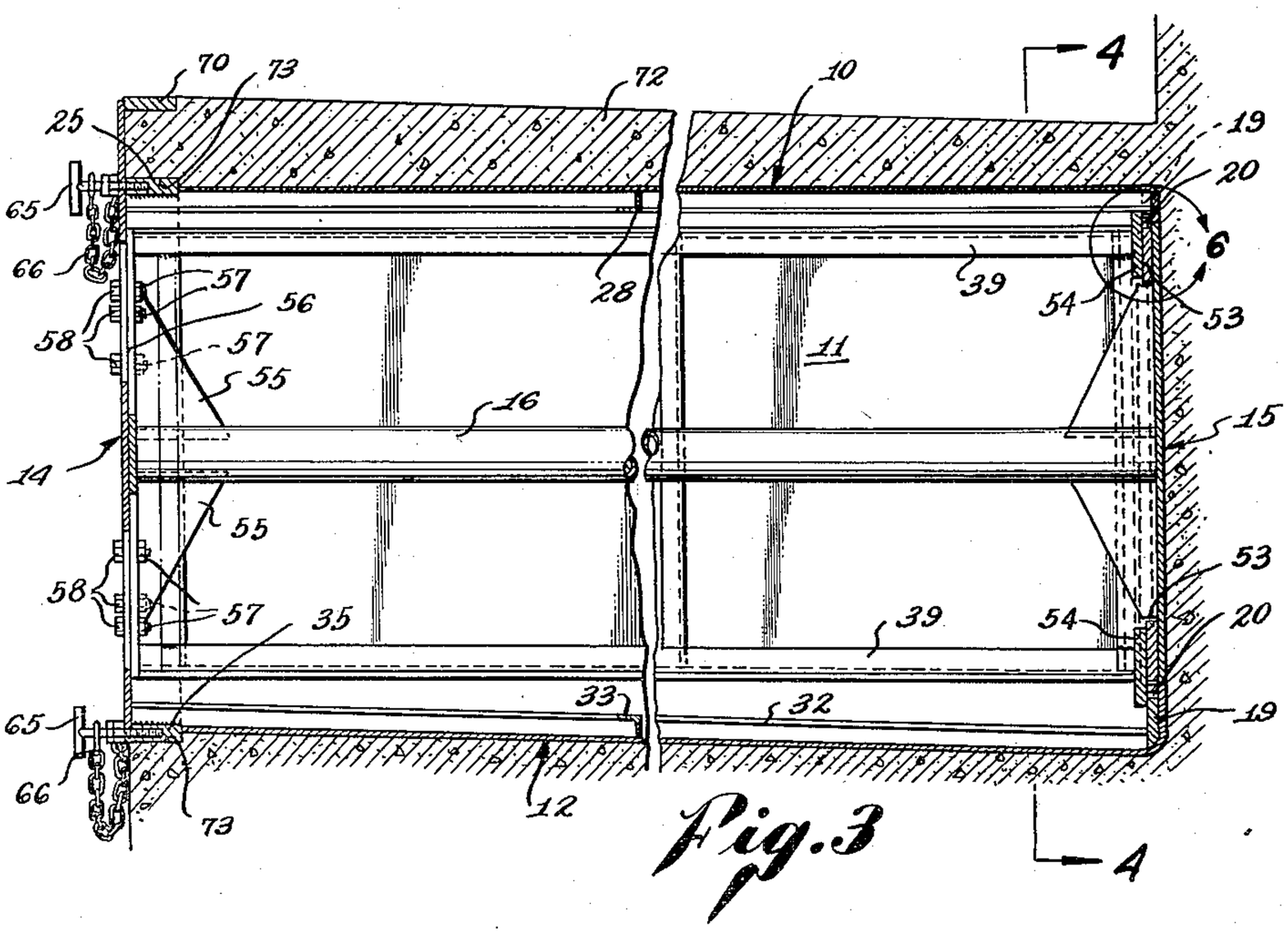

Fig. 3

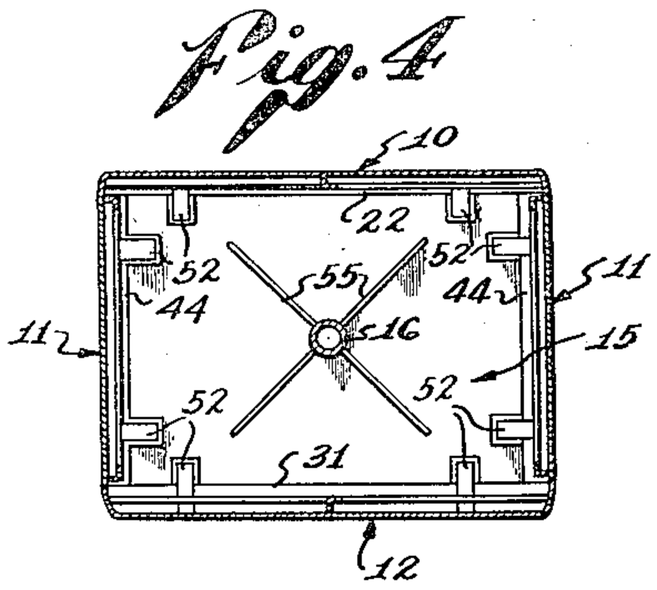

Fig. 4

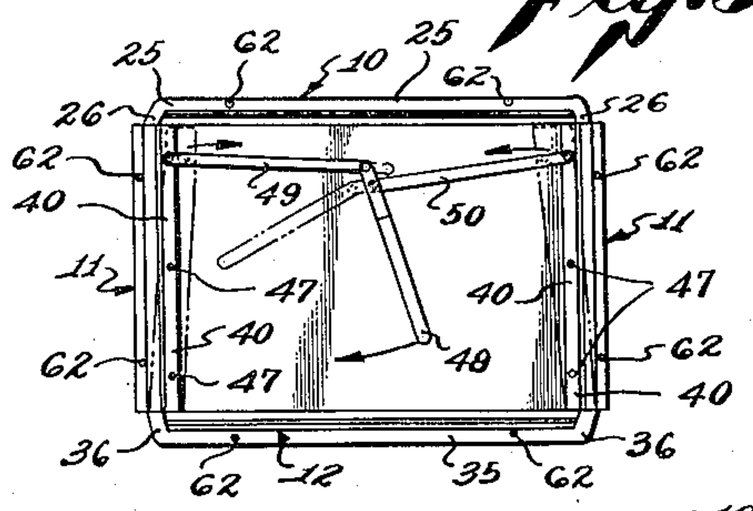

Fig. 5

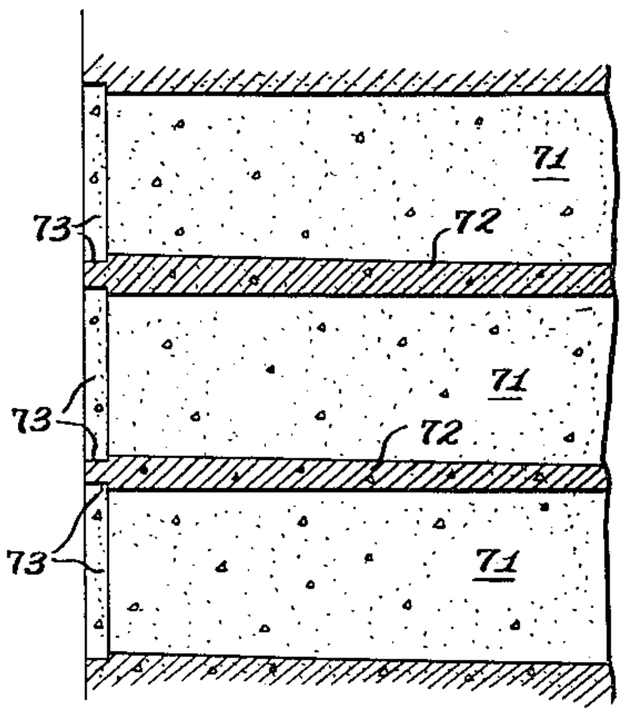

Fig. 7

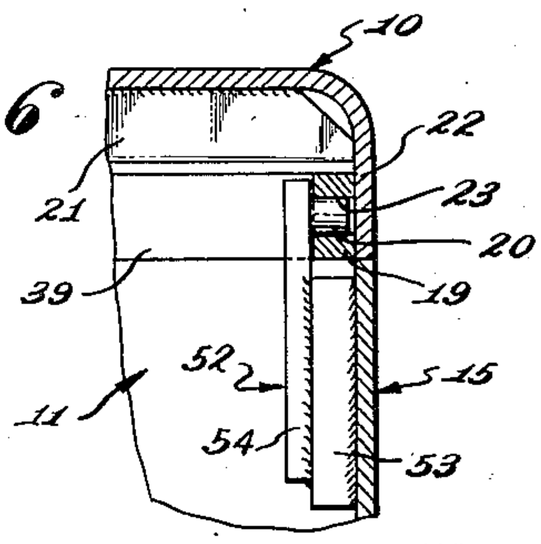

Fig. 6

INVENTOR.
MARION A. GARRISON
BY Edmund C. Kendrick
Attorney

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COLLAPSIBLE FORM FOR CONCRETE CRYPTS

Marion A. Garrison, South Pasadena, Calif., assignor to Glen Haven Memorial Park, San Fernando, Calif., a corporation of California

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2 Claims. (Cl. 25—130)

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This invention relates to concrete forms and is particularly directed to improvements in collapsible forms for casting concrete burial vaults and the like.

Efficiency and economy in the building of crypts in the form of concrete cell blocks for mausoleums require a collapsible core that can be used repeatedly without constant attention and repair and also can be collapsed and withdrawn from the hardened concrete with minimum labor.

The problem is to provide a form rugged enough to withstand rough usage, especially the impacts and stresses involved in pouring concrete, and at the same time to provide structural relationships in the construction that will permit the form to be dismantled and withdrawn with ease and dispatch after the concrete hardens. The general object of the invention is to provide such a concrete form or core.

A feature of the invention is the dismantling procedure it provides wherein all the steps involved in collapsing and withdrawing the form of a finished crypt can be performed quickly and easily by a workman at the mouth of the crypt. Special consideration is given to the usual difficulty of reaching, releasing and removing the remote wall at the blind end of the crypt as well as the further problem of releasing the side and bottom walls from the rear wall.

In this regard the invention is characterized by the use of a multiple-purpose structural member built into the collapsible form. One of the functions of this member is to serve as tension means for pulling the rear wall of the form forward to the mouth of the crypt and a second function is to serve when required, as leverage means for rocking the rear wall loose from adhering concrete. In addition to these two functions, the structural member serves as reinforcement to strengthen and stiffen the assembled form.

A further feature of the invention is the use of the above-mentioned structural member to interconnect the rear wall of the form with the front wall to form a unitary assembly that may be withdrawn in a simple manner with consequent automatic release of the side, top and bottom wall members of the form for collapse and removal. In addition a simple but highly effective provision is included to overcome any stubborn tendency for the released walls to adhere to the hardened concrete after the unitary assembly is withdrawn.

The above and other objects and advantages of the invention will be apparent from the following detailed description taken with the accompanying drawings.

In the drawings, which are to be regarded as merely illustrative,

Fig. 1 is a perspective view of the assembled form;

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Fig. 2 is an exploded view of the form with parts broken away to show the structure;

Fig. 3 is a longitudinal vertical section on an enlarged scale of the assembled form encased in concrete;

Fig. 4 is a transverse section of the form taken as indicated by the line 4—4 of Fig. 3;

Fig. 5 is a front elevation of the assembly of the longitudinal side, top and bottom wall members after the front and rear walls of the form have been removed, the view showing how a simple device may be used to loosen the remaining wall members from the adhering concrete;

Fig. 6 is an enlarged detail taken as indicated by the circle designated 6 in Fig. 3; and,

Fig. 7 is a fragmentary longitudinal section through a finished burial vault showing a vertical row of crypts molded by the invention.

The invention includes what may be termed an assembly of longitudinal side, top and bottom wall members that is releasably held together by front and rear walls. This longitudinal assembly may be made up of any number of wide or narrow wall members to form the longitudinal surfaces of the form, but in the preferred embodiment of the invention, as best shown in Fig. 2, the longitudinal assembly consists of only four wall members, namely a top wall member generally designated 11 10, two side wall members generally designated 11 and a bottom wall member generally designated 12.

Fig. 2 also shows the front wall generally designuated 14 of the form and the rear wall generally designated 15.

Extending from the rear wall 15 and rigidly mounted thereon is structure in the form of a tubular beam 16, which beam is preferably connected to the front wall 14 to form with the front and rear wall a unitary structure or assembly. Thus a first longitudinal assembly of the side, top and bottom walls is releasably held together by a second retractable assembly including the front and rear wall.

It is contemplated that at least the rear ends of the wall members comprising the longitudinal assembly will be released and separately freed by simple retraction of the front and rear wall assembly and that the front wall 14 will be releasable from the longitudinal assembly to permit such retraction of the rear wall 15.

To carry out these concepts, suitable connection means are required for releasable engagement of the surrounding wall members 10, 11 and 12 of the longitudinal assembly by the rear wall 15 of the retractable assembly. By way of example, the drawing shows such connection means in the form of a plurality of socket elements 19 and a corresponding plurality of complementary elements such as pins 20, either of which elements may be on either of the two as-

semblies. It is to be understood, of course, that other forms of connecting means may be utilized.

The top wall member 10 has the general configuration of an inverted shallow pan formed from relatively heavy sheet metal. As best shown in Fig. 2, it has rounded sides or longitudinal side flanges 21 and a similar rounded rear end flange 22. While the required socket elements 19 for the rear end of the top wall member 10 could be simple bores in the rear end flange 22, it is preferred to provide socket elements 19 in the form of relatively thick blocks of metal welded onto the rear end flange 22 as shown, each block of metal being formed with a suitable bore or socket 23 to receive one of the previously mentioned pins 20.

The front end of the top wall member 10 is not provided with a flange but instead has welded thereto a relatively heavy bar 25 which forms the front edge of the wall member and has down-turned ends 26 to conform to the longitudinal side flanges 21.

For reinforcement the top member 10 may have welded thereto on its inner surface a longitudinal angle iron 27 and an intersecting transverse angle iron 28 (Fig. 3).

The bottom wall member 12 is somewhat similar in configuration to the top wall member 10 but is tapered inasmuch as its up-turned longitudinal side flanges 30 gradually increase in depth or width towards the rear end of the wall member, the rear end flange 31 of the wall member being correspondingly increased in depth or width. The purpose of this progressive increase in depth is to mold the crypt with a rearwardly sloping bottom surface.

The bottom wall member 12 is shown reinforced by longitudinal and transverse angles 32 and 33 respectively and socket elements 19 are mounted on the inner surface of the rear end flange 31 to receive the previously mentioned pins 20. The front edge of the bottom wall member 12 is formed by a heavy transverse bar 35 similar to the previously mentioned bar 25 on the top wall member 10, the bar 35 having up-turned ends 36 conforming to the longitudinal side flanges 30.

Each of the side wall members 11 is in the form of a flat metal plate reinforced by angle irons 39 along its two longitudinal edges and further reinforced by a forward transverse angle iron 40, an intermediate transverse angle iron 41 and a rear transverse angle iron 42. A plate of metal is welded across the rear end of each side wall member 11 to form a rear end flange 44 and socket elements 19 are welded on the inner surface of this rear flange to receive the previously mentioned pins 20. The front end of each side wall member 11 is finished by a straight heavy bar 45 which in the assembled form matches, end for end, the upper bar 25 of the top wall member 10 and the lower bar 35 of the bottom wall member 12.

In the preferred practice of my invention, auxiliary means are employed when necessary to act in tension between the two side wall members 11 to free them from the adhering concrete after the retractable assembly has been removed from a molded crypt. To this end the forward angle irons 40 of the two side wall members 11 may be provided with holes 47 for cooperation with a suitable force-applying means such as the lever 48 shown in Fig. 5.

A link 49 pivotally connected to the lever 48 has a suitable pin on its outer end to enter a hole 47 for engagement with one of the side wall members 11; and a second link 50 pivotally mounted on the lever 48 at a second point in like manner has a pin on its outer end to enter a hole 47 for engagement with the opposite side member 11. With the two links 49 and 50 thus engaged with the two side wall members 11, a workman may swing the lever 48 as indicated by the arrow in Fig. 5 and thus place the two links 49 and 50 under exceedingly high tension to pull the two opposite side wall members 11 inward towards each other. Since the vertical angle irons 40 that are engaged by the links 49 and 50 are near the forward ends of the two side wall members 11, the described procedure involving the use of the lever 48 may be carried out by a workman standing outside the finished crypt.

As best shown in Fig. 4, the rear end flanges 22, 31 and 44 of the longitudinal wall members 10, 11 and 12 respectively, form a rectangle in which the rear wall 15 fits, the rear wall lying within this rectangle in the same plane as the rear end flanges when the mold is assembled for use. At such time the previously mentioned pins 20 are seated in the corresponding socket elements 19 on the surrounding end flanges 22, 31 and 44 to securely maintain the longitudinal wall members in their assembled positions.

The pins 20 are carried by suitable brackets 52 on the rear wall 15, which brackets may be constructed as indicated in Fig. 6. Each of the brackets 52 in the construction shown comprises a block of metal 53 welded onto the rear wall 15 to serve as a base and a short bar 54 welded to the block 53 in an overhanging position, the overhanging bar carrying a pin 20.

Preferably the tubular beam 16 is adapted not only for pulling the rear wall 15 forward but also for exerting leverage to rock the rear wall loose from adhering concrete. To provide the strength and rigidity required for exerting such leverage, suitable reinforcements may be added which will also serve to stiffen the rear wall 15 and to reinforce the entire assembled structure. For example, as shown in Fig. 2, heavy triangular plates 55 may be welded to the tubular member 16 and the rear wall 15, the plates being positioned radially of the tubular beam as shown.

The front end of the tubular beam 16 is connected to the front wall 14 by similar reinforcement plates 55 but in this instance the reinforcement plates are provided with flanges 56 and the front wall 14 is bolted to the flanges 56 so that the front wall may be disengaged from the tubular beam 16 whenever it is desirable to use the beam 16 to rock the rear wall 15 away from the adhering concrete. As best shown in Fig. 3, suitable nuts 57 may be welded on the inner surfaces of the flanges 56 for engagement by suitable bolts or machine screws 58 in the forward wall 14.

The front wall 14 is in the form of a flat plate which may have large holes 60 cut therein to provide edges that a workman may grip for the purpose of retracting the front and rear wall assembly. If desired, a rope or chain may be passed through the holes and looped around the tubular beam 16 to exert greater force on the retractable assembly.

The bars 25, 35 and 45 that form the front edge of the longitudinal assembly are provided with bores 62 and the front wall 14 may be provided with suitable pins such as the previously mentioned 20 to enter these bores for the purpose of holding the forward ends of the longitudinal wall members 10, 11 and 12 in place. It is desir-

able, however, that the retractable assembly of which the front wall 14 is a part, be secured against retraction to prevent release of the longitudinal wall members 10, 11 and 12 while the form is in use, and for this reason, I prefer to tap the bores 62 to permit the front wall 14 to be bolted to the longitudinal assembly.

The front wall 14 has bores to match each of the bores 62 in the bars 25, 35 and 45 and preferably the bores in the front wall are reinforced by blank nuts 64 welded on the front side of the wall as best shown in Fig. 2. To save time and trouble and make the use of wrenches unnecessary, I prefer to use two T-bolts 65, each of which is loosely held by a short chain 66 welded to the front wall 14. Each of the T-bolts has an integral flange 67 to tighten the front wall against the longitudinal assembly.

Preferably the front wall 14 extends above the top longitudinal wall member 10 of the assembled form and has at its upper edge a heavy bar 70 forming a thick inwardly directed flange of the same thickness as the shoulder formed on the bottom wall member by the bar 35 at the front end of the member.

As shown in Fig. 7, the described collapsible form is employed to form vertical rows of crypts 71 separated by horizontal concrete walls 72. It will be noted that each of the crypts 71 has a peripheral recess 73 around its entrance or mouth into which may be set facing structure for the finished mausoleum.

With the form assembled for use as shown in Fig. 1 and coated with oil, concrete is poured around the form as shown in Fig. 3, the various bars 25, 35 and 45 at the front end of the assembled form serving to form the above-mentioned peripheral recess 73 at the entrance to the crypt. It will be noted in Fig. 3 that the portion of the front wall 14 extending upward from the top wall member 10 of the form is used to mold the forward end of the concrete wall 72 that is to serve as the floor of the next crypt above.

The upper surface of this wall 72 slopes downward towards the rear to conform with the previously-mentioned downward slope of the bottom wall 12 of the form, and the flange 70 at the top edge of the front wall 14 molds the lower part of the peripheral recess 73 for the next crypt above.

After the surrounding concrete hardens, the six T-bolts 65 are loosened to be withdrawn and then the front wall 14 of the form is pulled forward to retract the rear wall 15 by the beam 16. If there is any undue difficulty about releasing the rear wall 15 from the adhering concrete, the bolts or machine screws 58 may be removed to permit the front wall 14 to be separated from the tubular beam 16 so that a workman may exert pressure on the front end of the beam to swing the beam in such manner as to exert rocking leverage on the rear wall 15. Such rocking action will break the rear wall 15 away from the most tenacious concrete.

With the front and rear walls 14 and 15 removed, the remaining wall members 10, 11 and 12 are free to collapse inwardly for removal from the crypt. Usually there is no difficulty in prying the two side wall members 11 away from the concrete to permit removal of the top and bottom wall members 10 and 12. If difficulty is encountered, however, it is a simple matter for the workman to engage the lever 48 with the side walls 11 by means of the links 49 and 50 as shown in Fig. 5 to exert such pulling force as will release at least one of the side wall members. Such action releases, or at least loosens, both of the side wall members. If one of the side wall members 11 yields but the other does not, the removal of the one side wall member will permit the top and bottom wall members 10 and 12 to be rocked loose from the adhering concrete and removed so that the workman may have better access to the remaining adhering side wall.

The above description in detail of a preferred embodiment and practice of my invention will suggest to those skilled in the art various changes and modifications within the scope and spirit of the appended claims.

I claim:

1. A collapsible form for concrete construction comprising: separate side, top and bottom longitudinal wall members having forwardly presented sockets on their rear ends; a rear wall carrying rearwardly directed connecting elements to enter said sockets to hold the rear ends of said longitudinal wall members in assembled positions; a front wall; means to releasably connect said front wall with the front ends of said longitudinal wall members to hold the front ends in assembled positions; and structure connected with said rear wall and extending forward therefrom to retract the rear wall thereby to release the inner ends of said longitudinal wall members for removal of the members whereby said front wall and rear wall may be removed from a formed cavity to release said side, top and bottom longitudinal wall members for subsequent individual removal from the cavity.

2. A collapsible form as set forth in claim 1 in which said front wall and said rear wall are interconnected by said structure for removal from the formed cavity in unison.

MARION A. GARRISON.

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