W. M. VENABLE.

TANK MOLD.

APPLICATION FILED AUG. 29, 1912.

1,125,221. Patented Jan. 19, 1915.

Fig. 1.

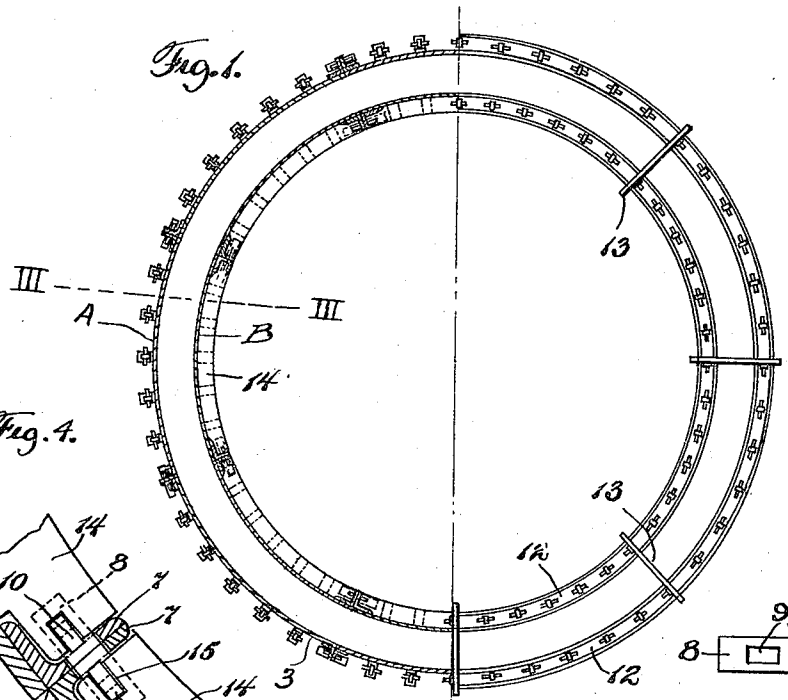


Fig. 4.

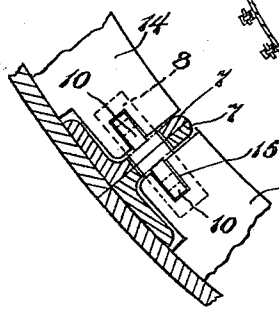


Fig. 5.



Fig. 6.

Fig. 3.

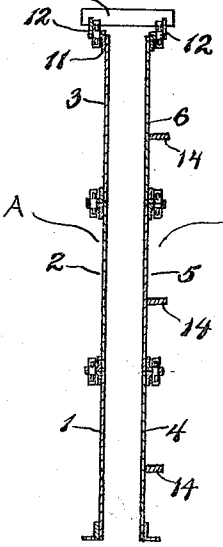


Fig. 2.

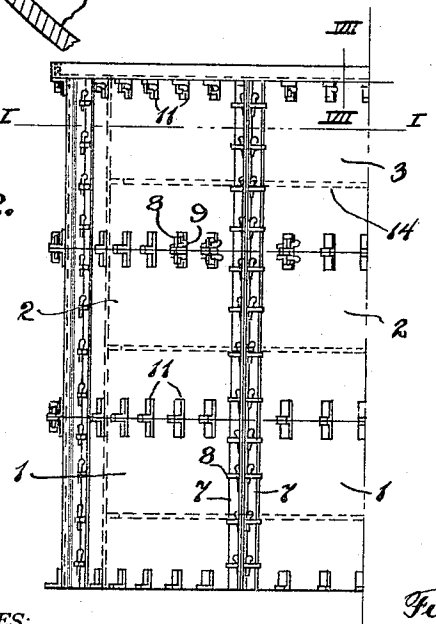
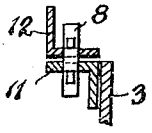


Fig. 7.



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WILLIAM M. VENABLE, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO BLAW STEEL CONSTRUCTION COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

TANK-MOLD.

1,125,221. Specification of Letters Patent. Patented Jan. 19, 1915.

Application filed August 29, 1912. Serial No. 717,663.

To all whom it may concern:

Be it known that I, WILLIAM M. VENABLE, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Tank-Molds, of which the following is a specification.

The invention relates to devices for molding tubular concrete bodies such as tanks, silos, and other similar devices. It has for its primary objects; the provision of a mold or form so constructed that its elements may be employed in structures of any diameter, the curvature of the plates employed being adjustable to suit requirements; the provision of a mold having improved means for reinforcing or stiffening the relatively flexible plates employed, and the provision of a structure employing flexible plates, wherein improved means are employed for securing accurate curvature and the necessary stiffness to resist deformation during the pouring and setting of the concrete. One embodiment of the invention is illustrated in the accompanying drawings, wherein—

Fig. 1 is a partial plan view of the apparatus and a partial horizontal section on the line I—I of Fig. 2, Fig. 2 is a side elevation of one half of the mold, Fig. 3 is a vertical section on the line III—III of Fig. 1, Fig. 4 is an enlarged horizontal sectional view taken above the ends of a pair of segmental stiffening bars, Fig. 5 is an enlarged plan view of one of the keys employed for securing the various sections of the mold together, Fig. 6 is a side elevation of the securing wedge employed in connection with the key of Fig. 5, and Fig. 7 is an enlarged sectional view on the line VII—VII of Fig. 2.

By reference to the drawing it will be seen that the mold consists of an outer tubular member A and an inner tubular member B spaced apart a sufficient distance to give the required thickness of wall for the tank, the concrete being poured between the two tubes or shells. In the particular embodiment of the invention illustrated the outer tubular member is composed of three rows of panels or plates (Fig. 3), all of which plates are similar, and the inner tubular member or shell B is also composed of three rows of panels all substantially similar. The panels comprising the lower row of the shell B are indicated by the reference numerals 1, while the second and third rows are indicated by the reference numerals 2 and 3 respectively. Similarly the panels constituting the first, second and third rows of panels of the inner shell B are designated respectively by the reference numerals 4, 5, and 6. Each of the panels 1, 2, 3, 4, 5, and 6 is provided along its vertical edges with angle irons 7, and these angle irons 7 on opposing plates are secured together releasably by means of a series of keys 8 provided with two slots 9 (Fig. 5), which slots receive the wedges 10, thus securing the plates together at their vertical edges. The series of plates thus connected together at their vertical edges constitute a relatively flexible band which can be bent to form a tube of any diameter desired, such diameter of course depending upon the number of panels secured together. The horizontal edges of the various panels are provided with clips 11, which clips are not sufficiently close together to interfere with the bending of the plates to the desired radius. The outwardly projecting flanges of opposing clips are detachably secured together by means of keys 8 and wedges 10 corresponding in all respects with the keys and wedges shown in Figs. 5 and 6 and employed for securing the vertical flanges of the various panels together.

It will be understood that in using the mold the lower section lying between the opposing series of plates 1 and 4 is poured, after which the next series of plates 2 and 5 are added, and concrete applied as before, the structure thus being built in courses to the desired height. Inasmuch as the tubular members made up of the series of plates are more or less yielding and do not assume the exact circular contour desired, templets are preferably employed at the upper edges of the rows of plates, in order to hold such upper edges in true circular form until the pouring has been completed, after which the templets can be removed, and secured to the top of the next series of plates, the lower edges of such next series of plates being of course held in proper position by the upper edge of the series of plates below in which the concrete has set to true circular form. These templets for both the inner and the outer rows of plates consist of angle irons 12 (Figs. 3 and 7), such angle irons being bent to the proper radius and being

secured to the clips 11 at the upper edges of the plates by means of the keys 8 and wedges 10 corresponding in all respects to the keys and wedges heretofore described and as illustrated in Figs. 5 and 6. In order to fix the distance between the inner and outer tubular members the spacing members 13 are employed (Figs. 1 and 3), such spacing members consisting of bars provided upon their edges with a pair of slots adapted to engage the upstanding angles on the templets 12.

In order to stiffen the inner tubular member B, which is under a compression strain tending to bend the plates from a true circular form, circumferential stiffening members 14 are employed (Figs. 1, 2, and 3). These stiffening members are placed between the upper and lower edges of the series of plates 1, 2, and 3, and consist of a plurality of segmental bars placed end to end in order to form a substantially complete circle, but with the ends of such bars terminating at the flanges of the angles 7, 7, as indicated most clearly in Fig. 4. The ends of the bars 14, 14, rest upon the ends of the keys 8, and are slotted as indicated at 15, to receive the wedges 10. It will be seen that these wedges 10 when driven into place serve the double function of locking the flanges of the angles 7, 7, together, and of wedging the stiffening members 14, 14, away from the flanges 7, 7, so that the application of the wedges places the bars 14, 14, under compression and renders the plurality of bars in effect a complete rigid circle, resisting all tendency of the plates to move inward under the pressure of the concrete. The stiffening bars or members 14 are thus held at any desired vertical position intermediate the upper and lower edges of the plates, and are tightened in such position. The number and spacing of the stiffening bars 14 may be varied to suit conditions. If desired, the templets 12 may be done away with and additional stiffening bars employed in their place, or vice versa. The various advantages to the construction as above described will be readily understood by those skilled in the art.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent, is the following.

1. In combination in a mold for forming tubular concrete bodies, a series of flexible plates placed end to end and forming a tubular mold, flanges extending along the vertical meeting edges of the said plates, means for detachably securing said flanges together, rigid circular stiffening means independent of the plates and comprising a plurality of sections lying against the interior surfaces of the plates intermediate the top and bottom edges thereof and maintaining the plates against inward movement, and releasable means between the ends of the sections and the flanges for placing the sections under compression.

2. In combination in a mold for forming tubular concrete bodies, a series of flexible plates placed end to end and forming a tubular mold, perforated vertical flanges extending along the vertical meeting edges of the said plates, perforated bars extending through the perforations in the said vertical flanges, rigid circular stiffening bars independent of the plates resting on said perforated bars and comprising a plurality of sections lying against the interior surfaces of the plates intermediate the top and bottom edges thereof and maintaining the plates against inward movement, and wedges extending through the perforations in the said perforated bars and lying between the ends of the said sections and the said vertical flanges and adapted to place the sections under compression.

3. In combination in a mold for forming tubular concrete bodies, a series of flexible plates placed end to end and forming a tubular mold, perforated vertical flanges extending along the vertical meeting edges of the said plates, perforated bars extending through the perforations in the said vertical flanges, rigid circular stiffening bars resting on said perforated bars independent of the plates and comprising a plurality of sections lying against the interior surfaces of the plates intermediate the top and bottom edges thereof and maintaining the plates against inward movement, and wedges extending through the perforations in the said perforated bars and lying between the ends of the said sections and the said vertical flanges and adapted to place the sections under compression, the ends of the sections being provided with slots to receive the wedges.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

WILLIAM M. VENABLE.

Witnesses:
LETITIA A. MYERS,
ARCHWORTH MARTIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."