R. B. HARTMAN.

CORE FOR HOLLOW CONCRETE STRUCTURES.

APPLICATION FILED AUG. 24, 1909.

1,033,798. Patented July 30, 1912.

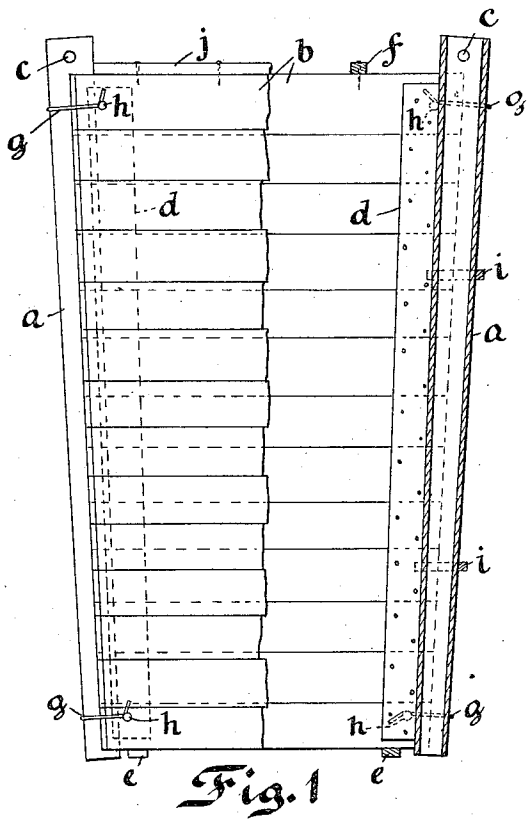

Fig. 1

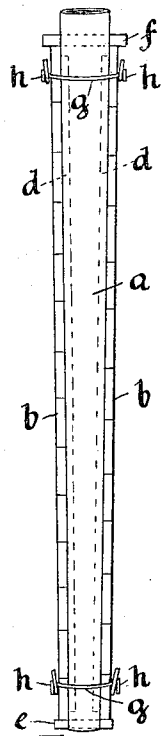

Fig. 2

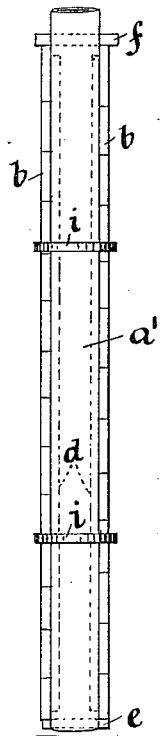

Fig. 4

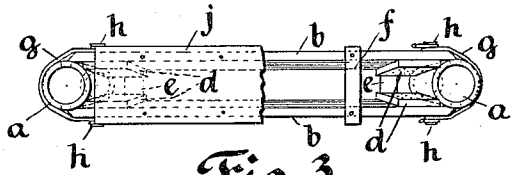

Fig. 3

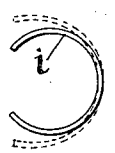

Fig. 5

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Witnesses

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CORE FOR HOLLOW CONCRETE STRUCTURES.

1,033,798. Specification of Letters Patent. Patented July 30, 1912.

Application filed August 24, 1909. Serial No. 514,389.

To all whom it may concern:

Be it known that I, RUDOLPH B. HARTMAN, of Milwaukee, Wisconsin, have invented a Core for Hollow Concrete Structures, of which the following is a specification.

This invention relates to structural concrete work, and has to do with hollow or cored forms such as are found in columns, chimneys, walls, piers and the like; and the object of my invention is to provide a simple, cheap and easily constructed collapsible core for the hollow spaces.

This form of core is more particularly adapted to flattened spaces, and it consists in its main elements of a pair of end-pieces, ordinarily pipes, forming the ends, and a pair of plates forming the sides, with means for temporarily holding these four pieces in proper position; and the core is collapsed by simply withdrawing the end-pieces, after which the side-pieces are left free.

The nature of my invention will best be understood from a consideration of the accompanying drawings illustrating the construction thereof, wherein—

Figure 1 is a front elevation of the core with the side-piece in front broken away on the right-hand side and the end-piece shown in section. Fig. 2 is a side elevation thereof. Fig. 3 is a plan-view thereof, part being broken away. Fig. 4 is a side view of an alternative form with non-tapering end-pieces, and Fig. 5 is a separate view of one of the spring-clips which may be used.

In these drawings every reference letter refers to the same part in each figure.

The four main elements of the core are the two end-pieces, designated *a*, and the two side-pieces, designated *b*. Said end-pieces may be in the form of bars of any desired shape and may be made with a taper as shown in Figs. 1 to 3, or of uniform section as shown at *a'* in Fig. 4. The former is the most desirable, the latter the simpler form. Ordinarily it will be found convenient to use gas-pipes or hollow tubular elements of like nature to form the end-pieces, as shown in the drawings; but it is not necessary that said end-pieces should be tubular, or that they should be of circular section. At their upper ends, means are provided such as holes *c* for engaging them with a hook, bar or other grappling device, whereby they are withdrawn endwise from the core after the concrete has set.

The side-pieces *b* are in the form of plates, preferably constructed of boards laid horizontally and secured together by battens *d*; said battens being set slightly within the ends of the boards so that they form seats or abutments for the end-pieces *a* when the ends of the board rest on the sides of the end-pieces; thus holding the end-pieces against inward displacement, as illustrated in Figs. 1 to 3.

In setting up the core, the side-plates *b* are temporarily held together by cleats *e*, *f* at top and bottom, at the proper spacing to allow the end-pieces to fit snugly between them; then the latter are secured in position by means of straps or wires *g* extending around them and secured at each end to a nail *h* or other appropriate fastening. If preferred, instead of the straps or wires *g*, spring-clips *i* may be used, shown in detail in Fig. 5, said clips holding the four parts together without necessitating the cleats *e* and *f*. If preferred, instead of or in addition to the upper cleats *f*, a plank *j* may be used to cover the open face of the core and prevent rubbish, tools, and other objects from falling in.

After the concrete is poured around the core, the latter is removed by simply withdrawing the end-pieces *a* endwise, leaving the side-pieces *b* free, and these latter can then be readily removed, leaving the straps or wires *g* and the clips *i* in the concrete if they fail to come out readily. The core is then ready to be set up again and reused in another place. It is to be observed that while the taper-form of piece *a* is theoretically the more correct as providing a certain amount of lateral "draft" in addition to the end "draft" given by tapering the side-pieces *b*, in practice this is not found necessary as a general rule, and nontapering pieces, especially if they are iron pipes, are used as being the cheapest and the most generally available.

Various changes and modifications in the constructions as herein shown may be made without departing from the spirit of my invention, and I wish it understood therefore that the latter is not otherwise limited than by the reasonable scope of my claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A collapsible core for hollow concrete structures comprising, in combination, a pair of bar-shaped end-pieces, a pair of plate-

shaped side-pieces each consisting of a plurality of transverse planks united by longitudinal battens, the ends of said planks resting against opposite sides of said end-pieces and said battens being set at a predetermined distance within the ends of said planks and forming abutments for said end-pieces to prevent inward displacement thereof; and means for holding said end-pieces against outward movement.

2. A collapsible core for hollow concrete structures comprising, in combination, a pair of bar-shaped end-pieces, a pair of plate-shaped side-pieces each consisting of a plurality of transverse planks united by longitudinal battens, the ends of said planks resting against opposite sides of said end-pieces and said battens being set at a predetermined distance within the ends of said planks and forming abutments for said end-pieces to prevent inward displacement thereof; and a number of bands passing around said end-pieces and having their ends engaging said side-pieces.

3. A collapsible core for hollow concrete structures comprising, in combination, a pair of bar-shaped end-pieces a pair of plate-shaped side-pieces each consisting of a plurality of transverse planks united by longitudinal battens, the ends of said planks resting against opposite sides of said end-pieces and said battens being set at a predetermined distance within the ends of said planks and forming abutments for said end-pieces to prevent inward displacement thereof; and a number of bands having their ends secured to said side-pieces and passing around said end-pieces to hold them against outward displacement.

4. A collapsible core for hollow concrete structures comprising, in combination, a pair of bar-shaped end-pieces of circular cross-section forming and closing the ends and a pair of longitudinally tapered plates each composed of a plurality of transverse members forming the sides and abutting at their end edges upon said end-pieces.

5. A collapsible core for hollow concrete structures, comprising in combination, a pair of end members substantially circular in cross section, a pair of flat plates each of a plurality of transversely disposed members the end edges whereof rest on opposite sides of said end members and form therewith a closed hollow space, and means for preventing inward and outward movement of said end pieces.

6. A collapsible core for hollow concrete structures comprising, in combination, a pair of downwardly tapering end-pieces substantially circular in cross section, and a pair of plate-shaped side-pieces the ends whereof are adapted to rest on opposite sides of said end-pieces; leaving half of the periphery of the latter protruding and means for maintaining said end-pieces from inward and outward displacment.

7. A collapsible core for hollow concrete structures comprising, in combination, a pair of downwardly tapering tubular end-pieces, a pair of downwardly tapering plate-shaped side-pieces, the ends of said side-pieces resting on opposite faces of said end-pieces, abutments on said side-pieces adapted to hold said end-pieces against inward displacement, means for connecting said side-pieces for holding them in position against said end-pieces, and means secured to said side-pieces and passing around said end-pieces for preventing outward displacement of the latter.

8. A collapsible core for hollow concrete structures comprising a pair of side-plates each having disposed vertically on its inner face and near but slightly within the opposite side-edges a pair of longitudinal strips; and a pair of end-pieces of circular cross-section which are adapted to abut against the outer edges of said strips and the inner face of the side-edges of said plates; thereby closing the interval between the side-plates.

9. A collapsible core for hollow concrete structures comprising a pair of side-plates each having disposed vertically on its inner face and near but slightly within the opposite side-edges a pair of longitudinal strips; and a pair of downwardly tapering end-pieces of circular cross-section which are adapted to abut against the outer edges of said strips and the inner face of the side-edges of said plates; thereby closing the interval between the side-plates.

In witness whereof, I have hereunto set my hand this 22nd day of April, 1909.

RUDOLPH B. HARTMAN.

Witnesses:

GEORGE W. COLLEY,

O. O'NEIL.