No. 803,259. PATENTED OCT. 31, 1905.

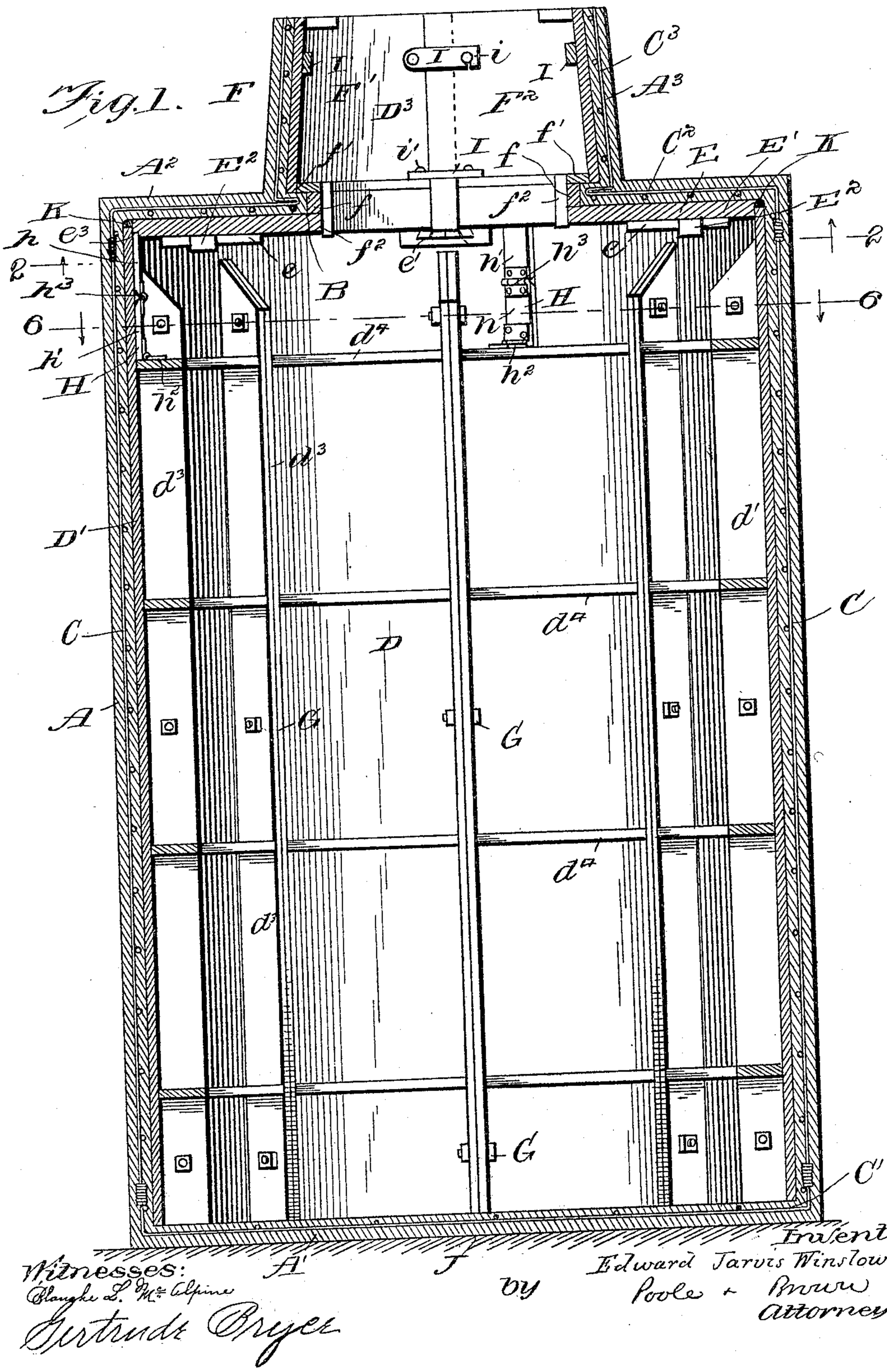
E. J. WINSLOW.

APPARATUS FOR CONSTRUCTING CONTAINING VESSELS.

APPLICATION FILED MAY 11, 1903.

4 SHEETS—SHEET 1.

Fig. 1.



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4 SHEETS—SHEET 2.

Fig. 2.

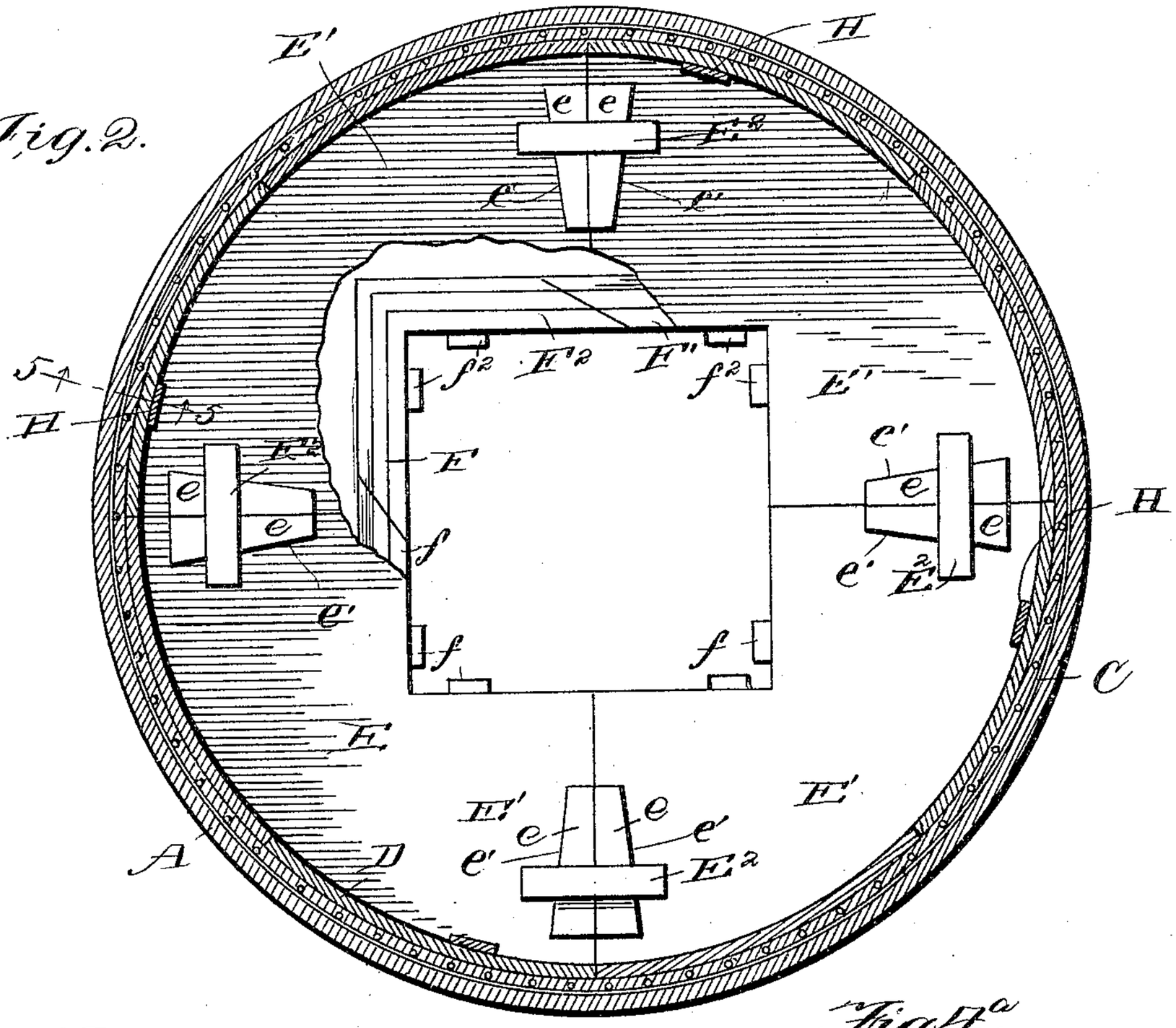


Fig. 3.

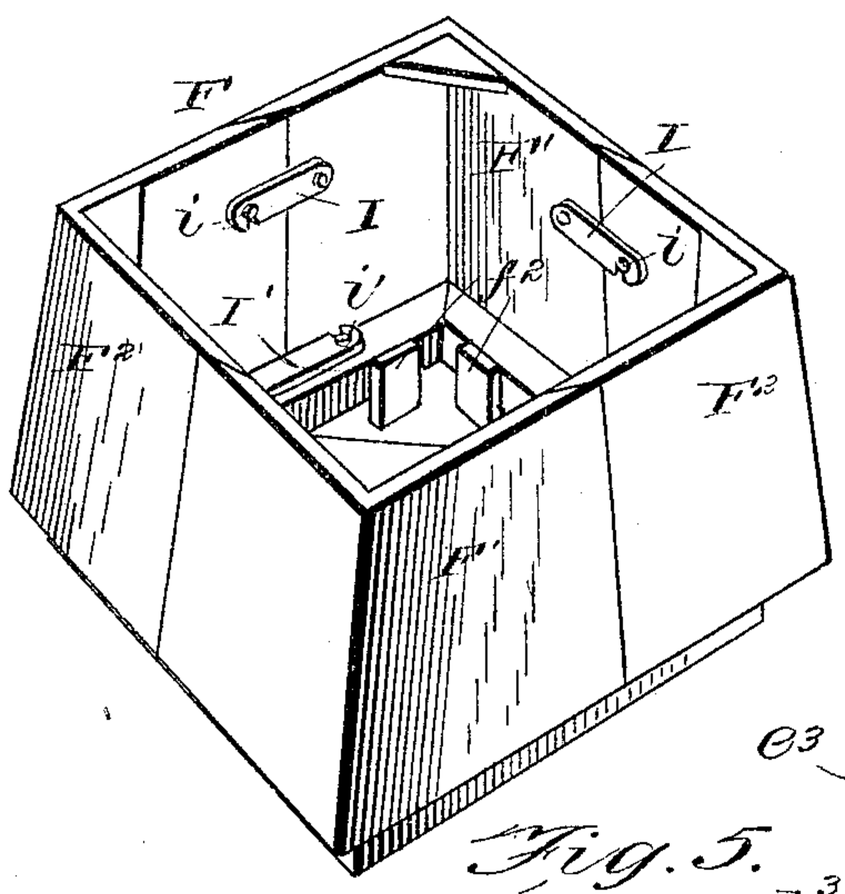


Fig. 4a.

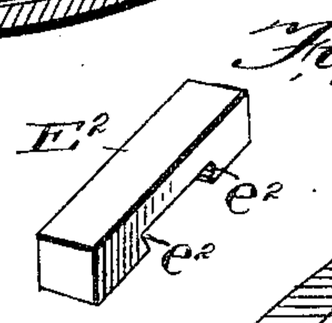
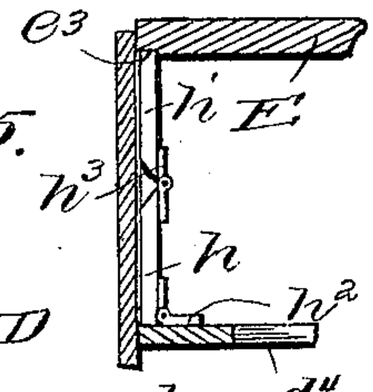


Fig. 4.

Fig. 5.



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4 SHEETS—SHEET 3.

Fig. 6.

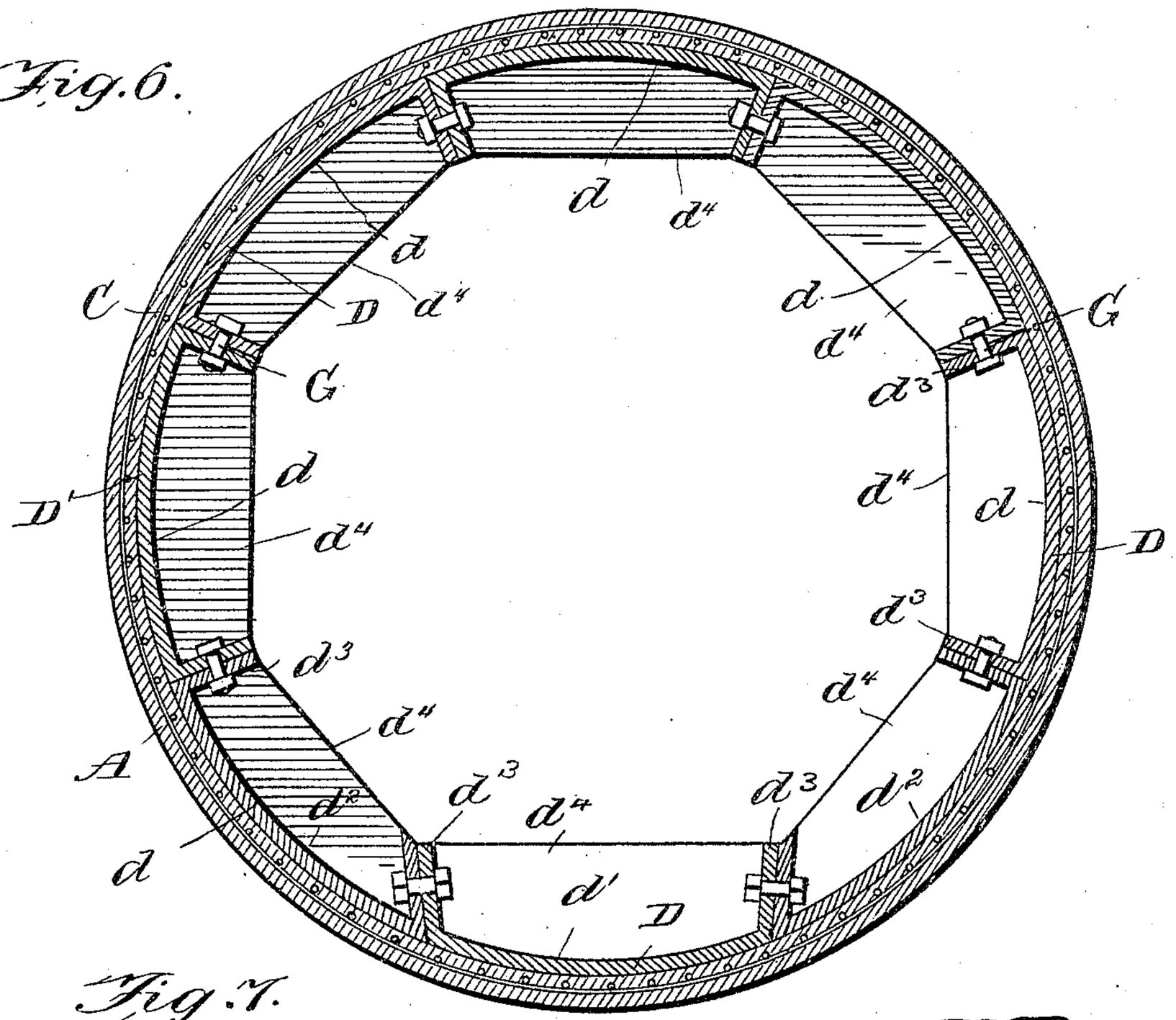


Fig. 7.

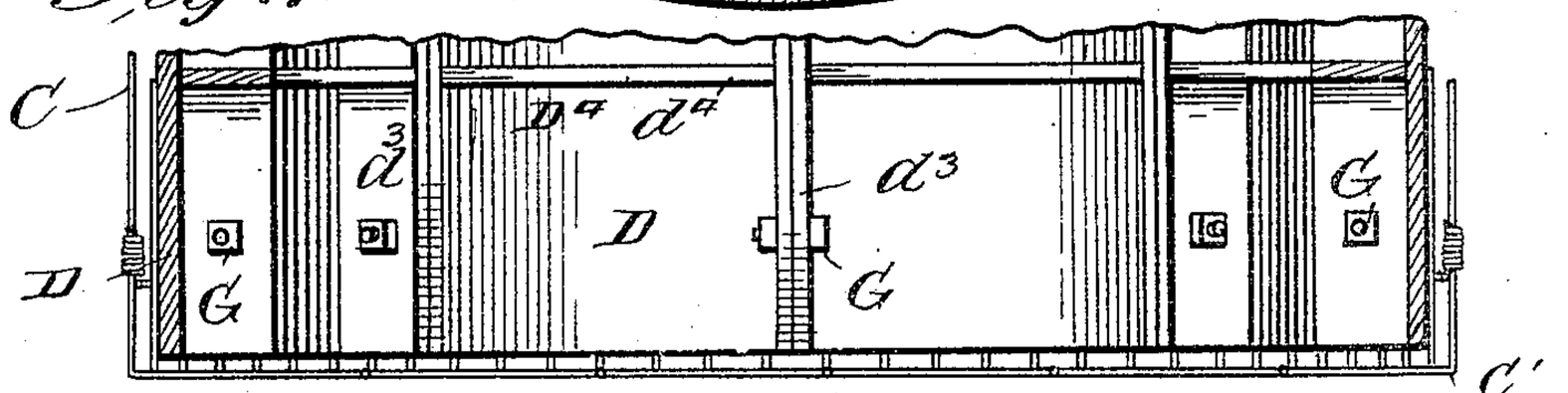
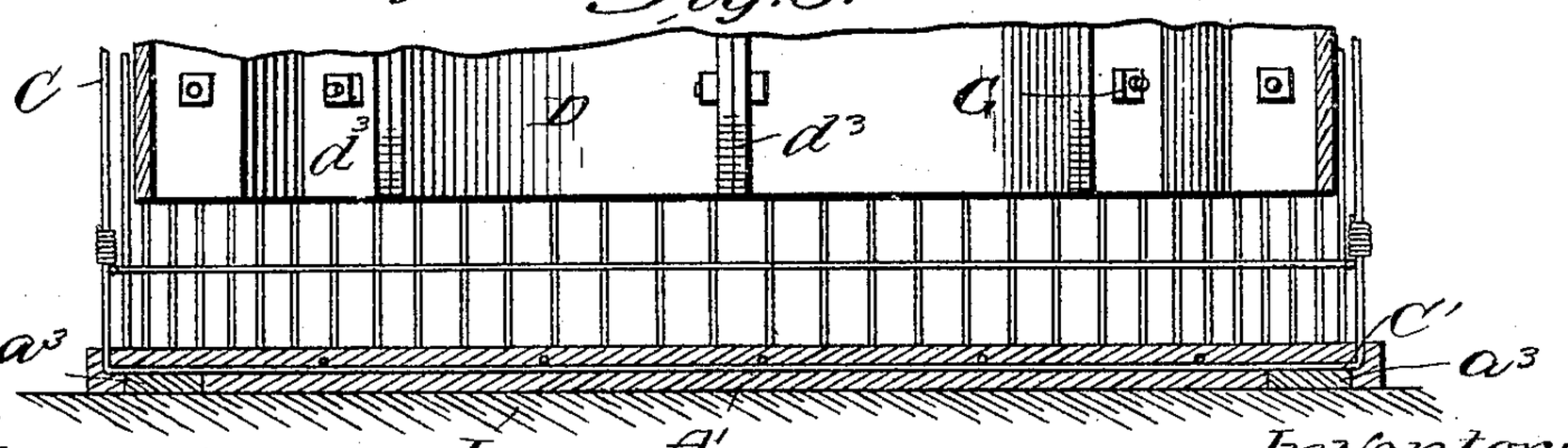


Fig. 8.



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4 SHEETS—SHEET 4.

Fig. 9.

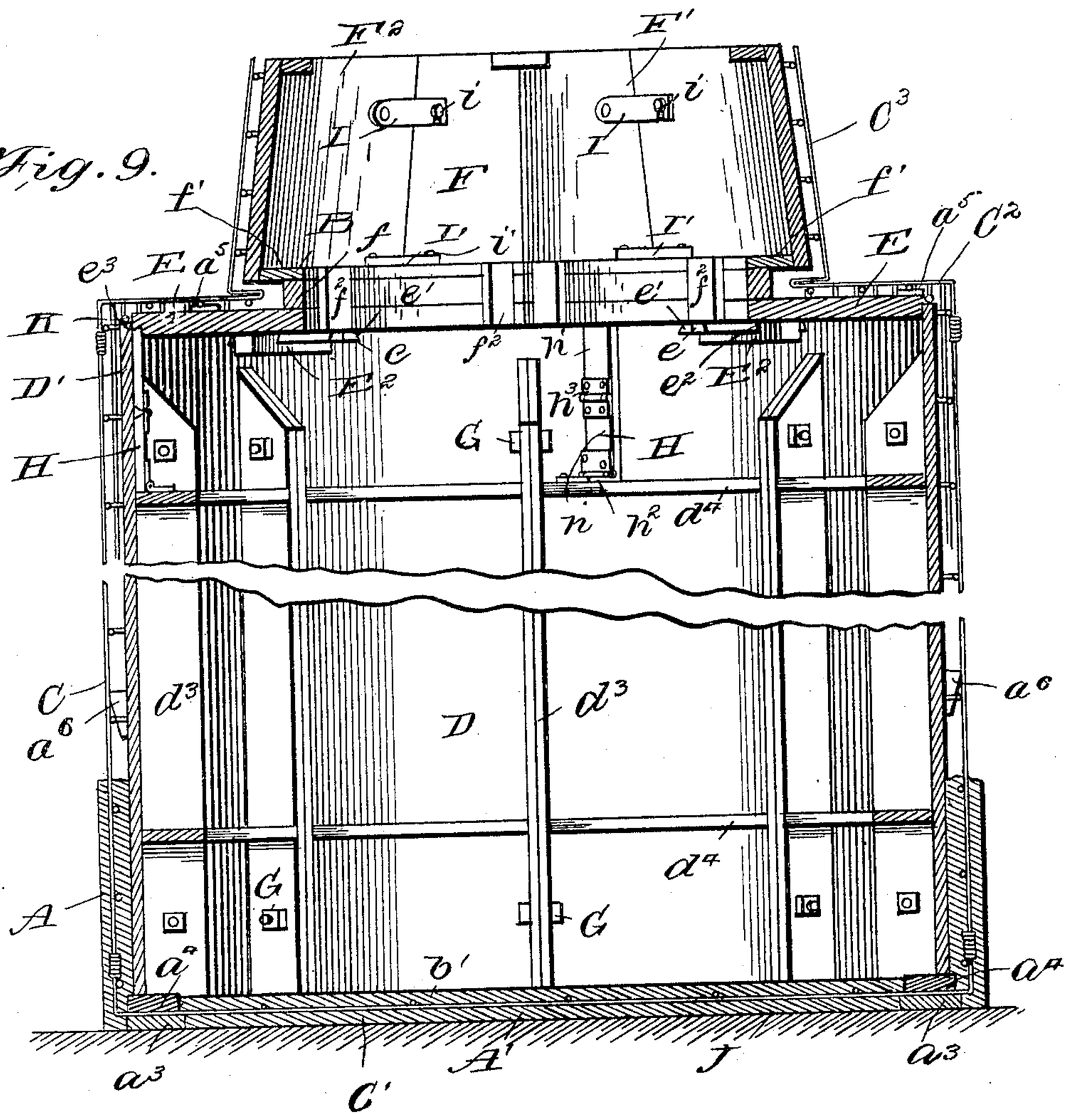
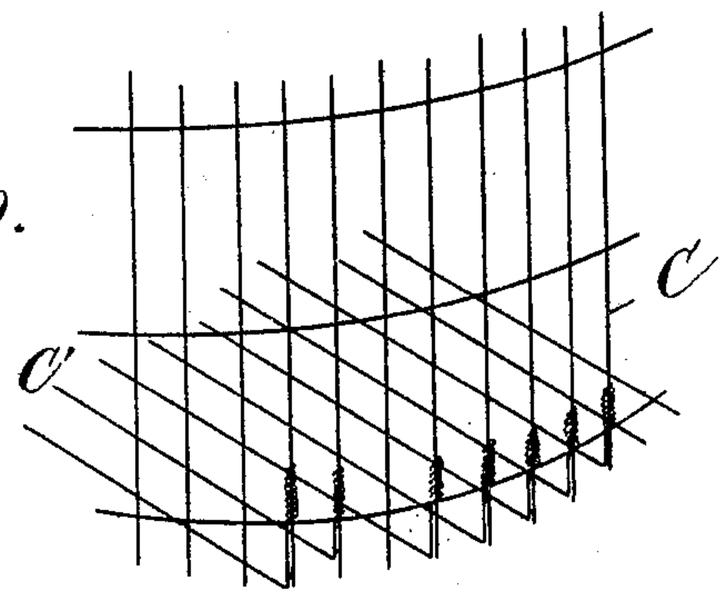


Fig. 10.



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UNITED STATES PATENT OFFICE.

EDWARD JARVIS WINSLOW, OF CHICAGO, ILLINOIS.

APPARATUS FOR CONSTRUCTING CONTAINING VESSELS.

No. 803,259. Specification of Letters Patent. Patented Oct. 31, 1905.

Application filed May 11, 1903. Serial No. 156,574.

To all whom it may concern:

Be it known that I, EDWARD JARVIS WINSLOW, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Constructing Containing Vessels; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an apparatus for use in the manufacture of a containing vessel made of cement or plastic material, consisting of a solid integral structure or monolith and having a restricted opening in its top.

The apparatus herein illustrated is more especially intended for making a vessel of the character above described having embedded in its walls a metallic cage for giving strength thereto, such as is illustrated and described in a separate application for United States Letters Patent, Serial No. 154,431, filed by me simultaneously herewith; but the apparatus forming the subject of the present application can also be used for making monolithic vessels which are without such metallic cage.

As shown in the accompanying drawings, Figure 1 is a view in central vertical section of an apparatus embodying my invention, the same embracing a sectional or collapsible core or form and the drawing illustrating a vessel in process of formation upon said core or form. Fig. 2 is a sectional view taken upon line 2 2 of Fig. 1, the same looking toward the top of the vessel, as indicated by the arrows in Fig. 1. Fig. 3 is a perspective view of the part of the core used for forming the neck of the vessel. Fig. 4 is a perspective view showing in detail the means of joining the parts of the top walls of the core. Fig. 4^a is a perspective view of the clamp-block shown in Fig. 4. Fig. 5 is a detail view taken on line 5 5 of Fig. 2, illustrating devices for supporting the top wall of the core. Fig. 6 is a plan section taken upon line 6 6 of Fig. 1. Figs. 7 and 8 are views in central vertical section of the lower part of the core, illustrating the process of constructing the vessel by the use of said core when said vessel is provided with a metallic cage. Fig. 9 is a sectional view taken through the upper and lower parts of the core, also illustrating the process of constructing the vessel. Fig. 10 is a detail view showing the means for joining the bottom to the side wall of the metallic cage in applying the same on or about the core.

In the said drawings, Figs. 1, 2, and 6, is shown a containing vessel, which in the instance illustrated is a jar designed for use in railway-yards and like places and intended to be sunk into the ground and to be a receptacle for battery-cells. The vessel shown consists of a cylindric body portion A, a bottom A′, and a top A^2, and has located upon the top A^2 a tapered rectangular opened neck A^3, through which access may be had to the interior of the vessel. Embedded in the wall of said vessel is a metallic cage or frame consisting of a cylindric body portion C, a bottom C′, a top C^2, and a rectangular neck portion C^3. Within the vessel is shown an interior core or form which corresponds in exterior shape with the internal form of the vessel over or upon the outer surface of which a mass, body, or layer of cement or plastic material is applied in forming the vessel. The said form or core embraces a cylindric side wall D, a top wall E, and a neck portion F. The cylindric body D is divided vertically or longitudinally into a plurality of parts or sections $d\,d'\,d^2$, which are detachably united to each other at their side margins. The meeting edges of the said segments are arranged in radial planes excepting in the case of one of segments d' and the segments $d^2\,d^2$ at either side thereof, the meeting edges of which are parallel or slightly divergent inwardly, thereby permitting the segment d' when detached from the segments $d^2\,d^2$ to be readily shifted or thrust inwardly into the hollow interior of the core. When the segment d' has been thus removed inwardly from its place, the other sections d and d^2 may be collapsed and separately removed.

In the particular construction illustrated each section of the core embraces a marginal frame consisting of flat vertical side or marginal members or ribs d^3, adapted to meet face to face with like side members of the other sections, and horizontally-arranged cross pieces or ribs d^4, which are attached at their ends to and extend between said longitudinal ribs d^3. Curved walls are attached to the outer curved faces of the cross-ribs d^4 and extend between the ribs $d^3\,d^3$, so as to constitute when the sections are joined the cylindric wall of the core. The sections or segments may be detachably secured at their edges in any desired manner, the devices herein shown for this purpose consisting of bolts

G, inserted through the upright ribs d^3 of the sections.

The top wall E of the core is removably secured to the cylindric body portion D, and said top wall is divided radially into a plurality of parts or sections E′ E′, which are detachably joined at their meeting edges. The top wall in the drawings is shown as consisting of four of said parts or sections. Devices for detachably joining the said parts or sections E′ E′ are provided, consisting, as shown in the drawings, of wedge-shaped cleats *e e*, attached to the under surface of the sections E′ adjacent to their meeting edges, and clamp-blocks E^2, provided with notches adapted to engage the side margins of said wedge-shaped cleats. The outer inclined edges *e′* of said cleats *e*, which are engaged by the clamp-blocks, are undercut, so that the two cleats when placed together form a rib of dovetail form, while the clamp-blocks have the end surfaces e^2 of the notches therein also undercut to fit the undercut edges *e′* of the said cleats, as clearly seen in Fig. 4. By applying the clamp-blocks to the cleats and forcing the said clamp-blocks toward the larger ends of the cleats the latter are drawn toward each other and the sections are thereby firmly clamped or secured together. The sections are readily separated by drawing the clamp-blocks backwardly from their places on the cleats.

The top wall E is adapted to fit within the upper margin of the cylindric or body portion D of the core and to give room for the downward movement of the said top wall a short distance within the said body part. The upright marginal pieces or ribs d^3 of the several segments terminate some distance below the upper margin of the wall E′. The downward movement of the said top wall within the cylindric body of the core is necessary in order that after the formation of the vessel upon the core said top wall may be dropped away from the top wall of the vessel to facilitate its detachment and removal therefrom. Provision is made for supporting the said top wall in its normal position during the process of forming the vessel, means for this purpose being shown in the drawings as follows: H H H are folding supporting braces or standards located one on each of several of the segments constituting the tubular body portion D of the core. Said standards are hinged at their lower ends to said segments, so that they may fold downwardly and inwardly. The standards H are each made in two parts or sections *h h′*, the lowermost one *h* of which is connected by a hinge h^2 with the upper horizontal rib d^4 of the segment, while the upper one *h′* is hinged to the lower one by means of a hinge h^3. The upper ends of said standards H are adapted to engage notches e^3 in the outer edge of the top wall, and said standards are made of suitable length to support the top wall E in proper position with respect to the upper edge of the body of the core. Said standards by means of their centrally-hinged construction may be folded inwardly, so as to no longer support the top wall and to thereby permit the latter to drop a short distance into the said body. The notches e^3, which engage the upper ends of the standards, as described, serve to hold the upper ends of the standards in place when the core is set up and the vessel is being formed thereon. The standards may, however, be readily folded to permit the descent of the top by drawing inwardly the central joints of the standards. The upper surface in the top wall is preferably located above the upper edge of the body D′ of the core, and a flexible packing-ring K is placed around the edge of the top wall, so as to rest on the upper edge of the body D′ and fill the angular space formed at this point. Such ring serves to prevent the plaster entering the joint between the top wall E and body D′ and forms a smooth and rounded inner surface at the junction of the side and top walls of the vessel.

The part F of the core on which the neck of the vessel is made is of rectangular form, as seen in top or plan view, and is shown as having an upward taper, the same being adapted to fit at its lower edge around a rectangular opening in the top wall E. Moreover, the parts at the junction of the said neck portion F of the core and the top wall E are so shaped as to form upon the inner wall of the neck of the vessel an inwardly-projecting rib or ledge B, said parts for this purpose being shaped to form a groove extending around the base of the neck part F. Said groove is formed by contracting the lower part of the portion of the neck part F, the contracted portion being indicated by *f* and the horizontal wall which joins the contracted part *f* with the body of the neck part F being indicated by *f′*, Fig. 1. The rectangular hole in the top wall E of the core is made of the same size as the inner surface of the contracted part *f* of the neck part of the core, and the latter rests upon the inner margin of the wall around said opening, so that the horizontal wall *f′* of the neck part overhangs the adjacent part of the wall, and thereby forms the groove which gives shape to the rib B around the base of the vessel-neck. The neck part of core is removably seated upon the top wall E thereof, and to hold the neck part in position the latter is provided with a number of guide prongs or projections f^2, shown in the drawings as consisting merely of pieces of wood or cleats secured to the inner faces of the contracted part *f* and projecting downwardly below the lower edges thereof, so as to engage the edges of the hole in the top wall E.

The neck portion F of the form is made of sectional and collapsible form, as shown in

Fig. 3, and consists, as shown in the drawings, of two pairs of like corner parts or sections F′ F′ and F^2 F^2. The meeting edges of the sections F′ and F^2 are beveled or inclined in such manner that the sections F^2 F^2 may be shifted or moved inwardly toward each other, and thus permit all of the sections to be separately removed from within the neck of the finished vessel. To enable this to be done, the oblique margins or edge faces of each corner-section F^2 are made parallel with each other, or somewhat outwardly divergent or flaring, as shown in the drawings, Figs. 2 and 3. It will of course be understood that the oblique joints between the said corner-sections will extend downwardly through the contracted or base portion of said neck part F, as seen in Fig. 2.

For the purpose of detachably securing together the corner-sections F′ F^2 of the neck portions of the core any suitable attaching devices may be used, those herein shown consisting of latch-plates I I′, pivoted to one section and having lateral notches adapted to engage headed studs *i″ i″*, secured in the other section. As herein shown, the latches I are located on the inner faces near the upper margins of the neck portion of the mold or form, while the latches I′ are mounted on the top surfaces of the horizontal parts *f′* of said neck portion.

When the sectional core described is set up ready for use, the parts thereof will be assembled as shown in Fig. 1, the several segmental sections of the tubular body of the form being joined to each other, the top wall E resting within the upper margin of the tubular body upon the hinged standards H and the four corner-sections F′ F′ and F^2 F^2, constituting the neck portion F, being joined to each other and resting in proper position on the top wall E. After the cement has been applied to the outer surface of the form thus made and has been permitted to harden the parts of the form will then be removed as follows: The latches I and I′ are first released and the opposite corner-pieces F^2 F^2 then drawn inwardly and removed from the neck and the remaining sections F′ F′ likewise removed. The hinged braces or standards H will then be thrown inwardly, thereby permitting the top wall E to drop away from the top wall of the vessel. The clamp-pieces E^2 will then be detached, so as to permit the separation of the top wall into four pieces, which are taken out through the open neck of the vessel. The bolts connecting the several segmental sections of the tubular body will then be removed, the section *d′* drawn inwardly from its place to release the other sections, and the several sections will then be taken out one by one through the neck of the vessel.

In the use of the core described for forming a vessel of plastic material the bottom wall of the vessel is first formed by applying a layer of cement, such as is indicated by A′ in Figs. 7, 8, and 9, upon a horizontal platform or supporting-surface J, as illustrated in said figures. The core is then supported in position over the layer of cement placed upon the platform J and plaster applied to the outer surface of the core to form a continuation of the layer A′ thus applied to the platform and the application of the plastic material thereafter continued until the entire outside surface of the core is covered, the bottom, sides, and top of the vessel being formed in one continuous operation before the plastic material has set or hardened.

When the vessel is to be provided with a metallic cage, I proceed as follows: I first apply the fabric which is to constitute the tubular body C of the cage around the body part of the core, attaching the fabric temporarily to the core, but making the tubular body sufficiently larger than the core to leave a space between them for the plaster or cement which is to form the inner part of the vessel-wall. I then attach the metal-fabric bottom C′ to the tubular body by joining the wire ends of said bottom to the wires of the tubular body in the manner shown in Fig. 10. I then apply the layer of plaster or cement A′ to the platform J, making the layer thick enough and of proper size to form the bottom wall of the vessel. I then suspend the core with the tubular body and attached bottom of the cage over the layer of cement, as seen in Fig. 7. Said tubular body of the cage is then loosened from the core, so as to permit the said body and the bottom C′ to drop and rest upon the layer of cement. The bottom of the cage is then pressed downwardly into the cement until properly embedded therein, this being done while the cement is still so soft as to permit the wires to easily sink or be forced into the mass or layer. In order to insure that the wire-fabric bottom shall be suitably located in the cement layer, I place in the cement layer, beneath the margins of the bottom, a number of spacing-blocks a^3, as seen in Fig. 7. After the bottom of the cage has thus been embedded in a cement layer resting upon the platform, as shown in Fig. 8, the core is lowered until its lower edge reaches the point just above the top of the cement layer, as seen in Fig. 9. Spacing-blocks a^4 are located in the cement layer on the upper surface of the bottom *b′* and beneath the edge of the core, so as to support said core with its lower edge slightly above the level of the top of the cement layer *a′*, as clearly seen in Fig. 9. The spacing-blocks a^3 a^4 may be made of cement, and in which case they will form part of the bottom wall when the cement hardens. After the core has thus been located over the cement bottom A′ the top wall C^2 of the cage will be placed in position over the top wall of the core and joined at its edges to the tubular body of the

cage by twisting the ends of the wires of the parts together in the same manner as illustrated in Fig. 10. Spacing-blocks a^5 will be placed between the top wall of the core and the top of the cage, so as to hold the latter at a distance above the top wall of the core equal to the thickness of the cement to be applied inside of the top of the cage, as clearly seen in the sectional view in Fig. 9. The parts will then be in condition for the application to the cage of the plaster or cement which is to form the side walls, top, and neck of the vessel. The application of the cement to the tubular body of the cage is begun at the lower edge thereof, so as to form an upward continuation of the cement layer A′ resting on the platform J, it being, of course, understood that the plastic material is applied from the outside of the metallic cage and is pressed through the open spaces thereof and against the core. During the application of the cement to the tubular body of the cage the latter is held by any suitable means at a uniform distance from the surface of the core. The means used for this purpose may conveniently consist of wedges a^6 a^6, interposed between the circumferential wires of the cage and the outer surface of the core. Conveniently a set of such wedges will be applied to one of the circumferential wires near the bottom of the vessel before the application of the plaster begins, and when the plaster has been applied nearly to the level to the set of wedges so located the wedges are removed and inserted behind another one of the wires at a higher elevation and the application of plaster continued until the wedges are again reached. The same operation will be repeated until the side wall of the vessel is completed. The top wall of the vessel will then be finished, the spacing-blocks a^5 being removed, if desired, as the work progresses; but if the blocks are made of cement they may remain in place and form part of the finished top wall. After the entire exterior surface of the core and the cage has been covered by a layer of cement of suitable thickness and the cement has been allowed to harden the core will be removed through the orifice in the top of the vessel or through the open neck, if the same be present, in the same manner as before described.

In prior devices for like purposes embracing a top wall made of detachable joined sections which extend over and rest on the top edge of the body of the core the removal of the section first to be taken out, especially in the case of a flat top wall, is made difficult, if not practically impossible, because of the fact that the sections are divided on radial lines, and the section first to be removed must be drawn inwardly before it can be disengaged at its outer margin from the wall of the body. By making the top wall of radially-joined sections and smaller than the body, so that the margin of the top wall fits within the top edge of the body, as hereinbefore described, the top wall as a whole may be first lowered into the body and its sections then disengaged from each other, or either section may be easily dropped from its place and taken out by first disconnecting it from the other sections without any movement of the section to be removed toward the center of the top or away from the top edge of the body for disengaging it from the latter. The process of removal of the top wall is thus greatly facilitated, while at the same time the structure of the core is greatly simplified, because the top wall may be made of a few sections only, the size of said sections being only limited by the size of the opening through which they are removed from the finished receptacle.

An important advantage is gained by the use as a means of connecting the parts of the sectional top wall of the wedge-shaped cleats and notched clamp-blocks when these parts are undercut on their tapered contact edges, for the reason that by this feature of the construction the sections are not only firmly clamped together at their meeting edges, but are also held rigidly in the same plane with each other. When the parts constituting a flat top wall are joined by the clamping devices described, the joined sections constitute, in effect, a single rigid structure which may be sustained by supports engaging at its outer margin only at three or more points of its circumference—in other words, by means of the rigid connection between the sections constituting the top wall said sections need not be separately supported, while at the same time the construction of the top wall is very simple, and the same may be easily handled in setting up and taking apart the core.

I claim as my invention—

1. A collapsible core for the purpose set forth comprising a tubular open-ended body consisting of a plurality of longitudinally-separated sections, a top wall consisting of a plurality of radially-separated sections, and means for rigidly and detachably connecting said sections with each other; said top wall being smaller than and adapted to enter within the top margin of said tubular body.

2. A collapsible core for the purpose set forth comprising a tubular sectional body, a separate sectional top wall adapted to enter within the open upper end of the body, and supporting means on the body adapted to engage the margin of the top wall and to permit the said top wall as a whole to be lowered into the body.

3. A collapsible core for the purpose set forth, comprising a tubular, sectional body, the sections of which embrace longitudinal and transverse ribs, and a sectional top wall adapted to enter within the open top of the body, the longitudinal ribs of the body-sections being terminated at their upper ends be-

low the upper edge of the body to permit the descent of the top wall into the upper end of the body.

4. A collapsible core for the purpose set forth, comprising a tubular, sectional body, each of the sections constituting the tubular body embracing longitudinal ribs located at the side edges of the sections and adapted for contact with like ribs of adjacent sections, and transverse ribs extending between the longitudinal ribs.

5. A collapsible core for the purpose set forth, comprising a tubular, sectional body and a sectional top wall, each of the sections constituting the body embracing longitudinal ribs, and tranverse ribs extending between the said longitudinal ribs, and means for detachably joining the sections, adapted to engage and clamp together the longitudinal ribs on adjacent sections.

6. A collapsible core for the purpose set forth, comprising a tubular, sectional body, a sectional top wall adapted to enter within the open upper end of the body and means for supporting the top wall comprising a plurality of folding standards which are connected by hinges with the body.

7. A collapsible core for the purpose set forth, comprising a tubular, sectional body, a sectional top wall adapted to enter within the open upper end of the body and a plurality of folding standards which are hinged to the body; said top wall being provided with notches for engagement with the upper ends of said standards.

8. A collapsible core for the purpose set forth, comprising a tubular, sectional body, a sectional top wall, and means for detachably joining the sections constituting the top wall, consisting of wedge-shaped cleats attached to the under sides of the adjacent parts of adjoining sections and notched clamp-blocks adapted to engage the wedge-shaped cleats, said cleats being undercut at their outer edges and the ends of the notches in the clamp-blocks being correspondingly shaped to fit the cleats.

9. A collapsible core for the purpose set forth, comprising a tubular, sectional body, a sectional top wall adapted to enter within the open upper end of the body and which projects above the upper edge of said body, so as to form with the top edge of the body a groove or rabbet, and an annular elastic packing-ring applied around the said top wall in contact with said upper edge of the body and filling said groove or rabbet.

10. A collapsible core for the purpose set forth, comprising a tubular, sectional body, a sectional top wall, a neck portion consisting of a plurality of sections and fastening devices for joining the sections of the neck portion consisting of notched catches each of which is pivoted to one section and is adapted to engage a headed stud on an adjacent section.

11. An apparatus for the purpose set forth, comprising a horizontal surface or platform, a tubular, open-ended, sectional body, a sectional top wall which fits at its margins within the open end of said tubular body, and a sectional neck portion adapted to rest on the top wall.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 30th day of April, A. D. 1903.

EDWARD JARVIS WINSLOW.

Witnesses:

C. CLARENCE POOLE,

BLANCHE L. MCALPINE.