May 22, 1934. F. H. VAN NESS 1,959,773

BURIAL VAULT

Filed March 9, 1932 4 Sheets-Sheet 1

FIG. 1.

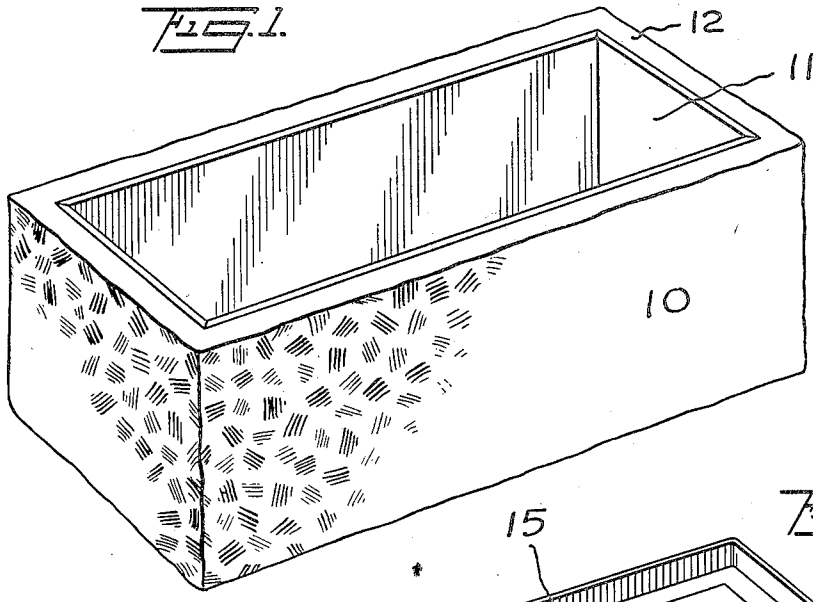


FIG. 2.

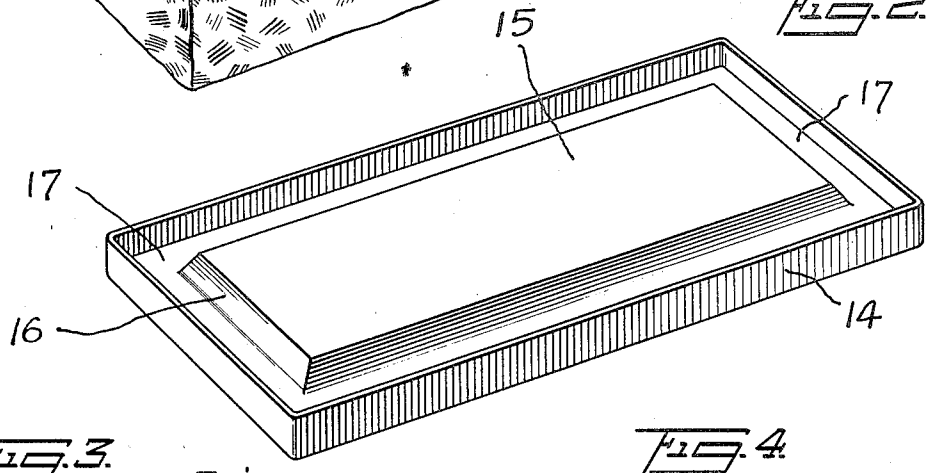


FIG. 3.

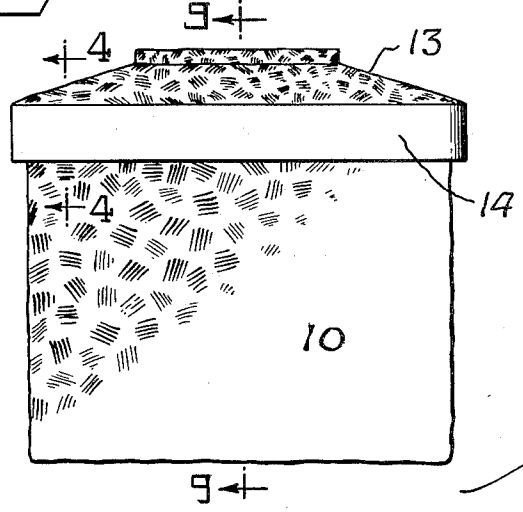
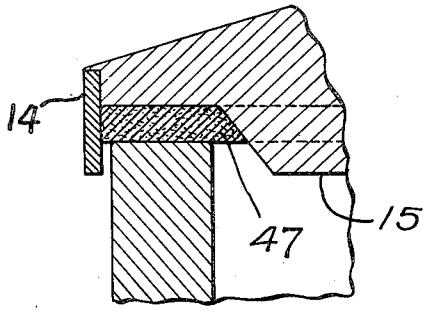


FIG. 4.



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BURIAL VAULT

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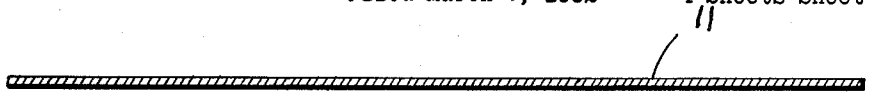

FIG. 5.

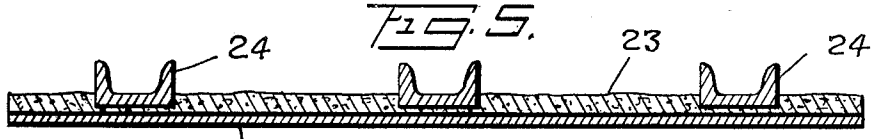

FIG. 6.

FIG. 7.

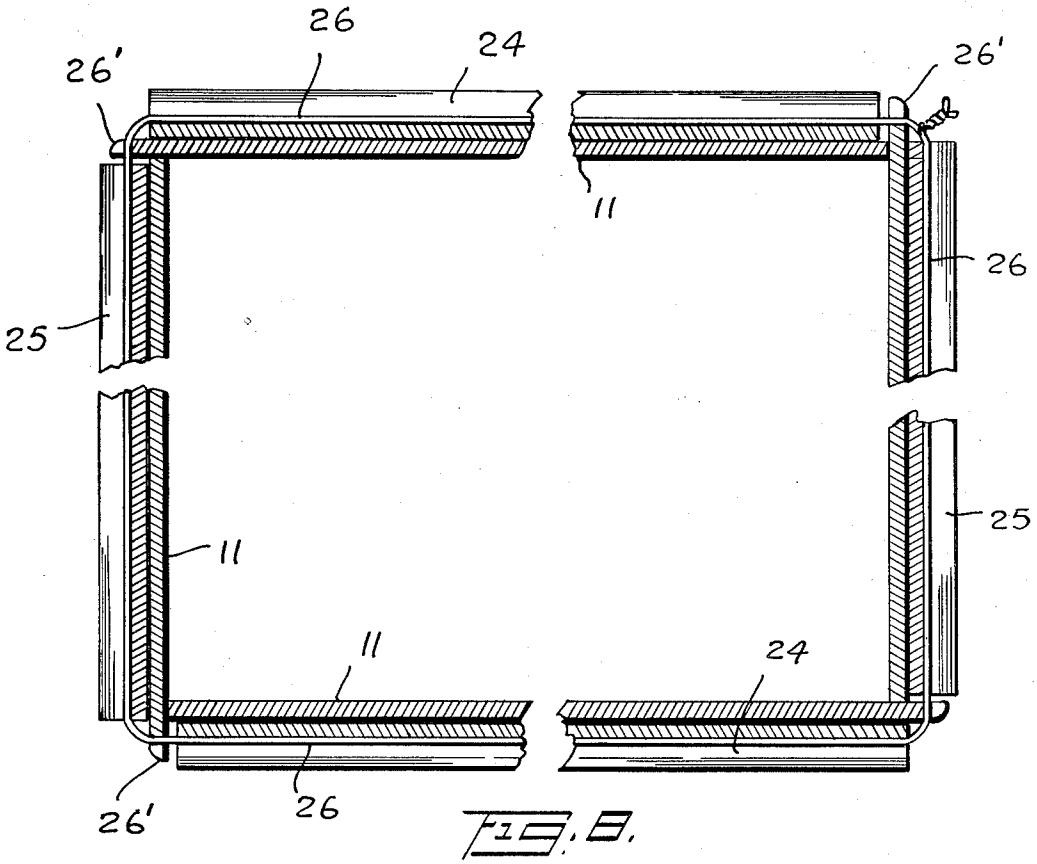

FIG. 8.

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FIG. 9.

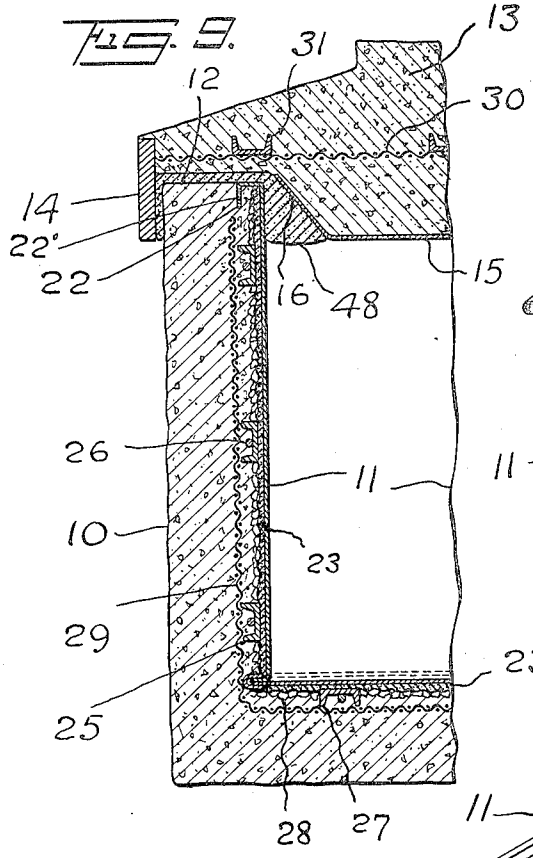

FIG. 10.

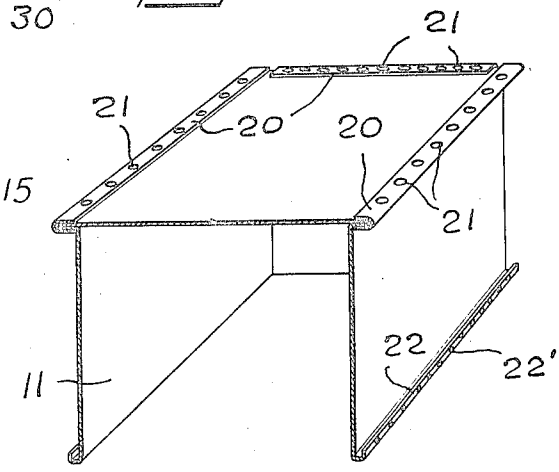

FIG. 11

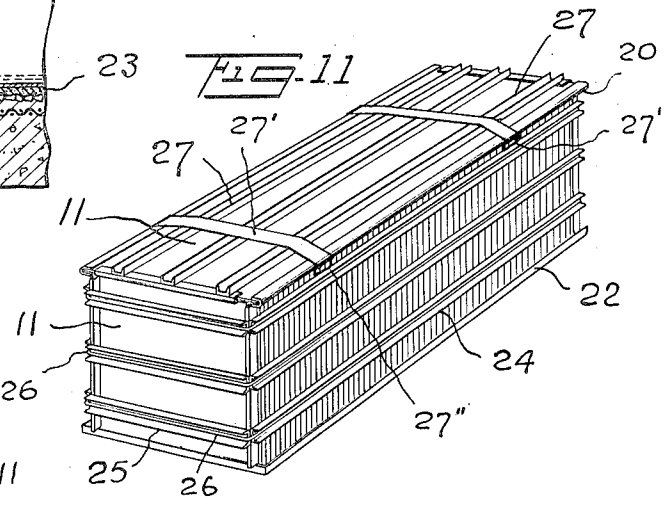

FIG. 12

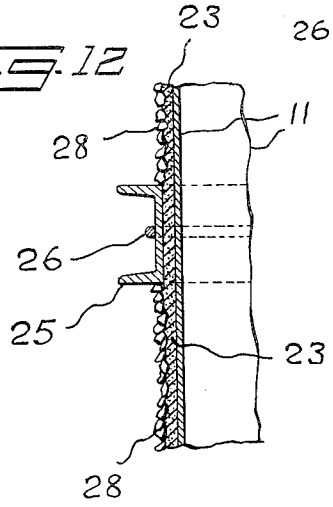

FIG. 13

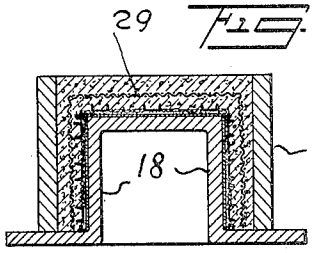

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Fig. 14.

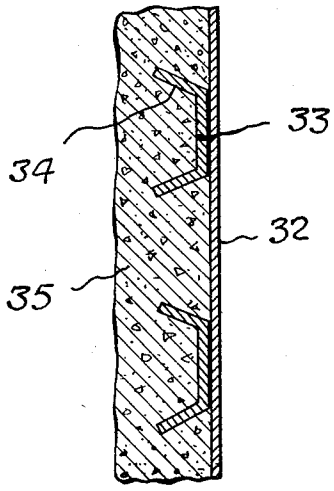


Fig. 15.

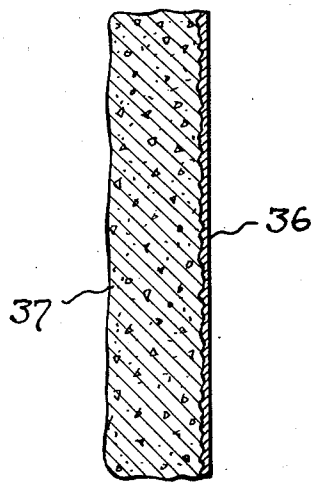


Fig. 16.

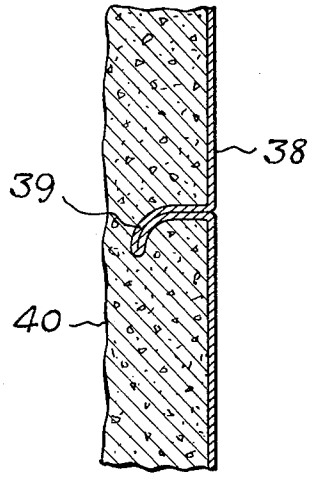


Fig. 17.

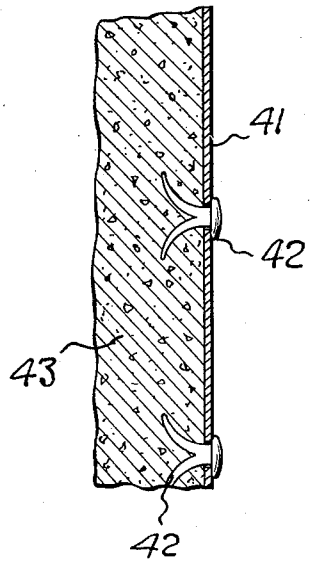
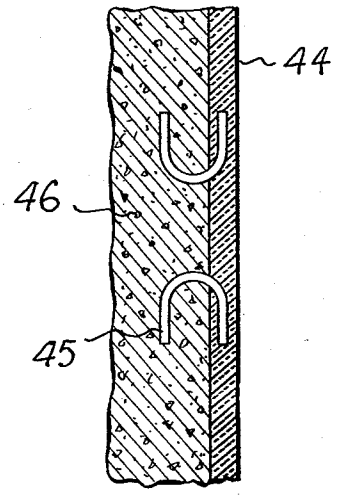


Fig. 18.



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Patented May 22, 1934 1,959,773

UNITED STATES PATENT OFFICE

1,959,773

BURIAL VAULT

Frank H. Van Ness, Bronxville, N. Y., assignor to American Vault Company, a corporation of New York

Application March 9, 1932, Serial No. 597,647

5 Claims. (Cl. 72—7)

This invention relates to a burial vault of the type in which the casing or body of the vault is formed of concrete with an internal reinforcement and an inner lining of sheet-metal or of suitable composition or material, and in which the cover is formed of reinforced concrete with an internal facing of sheet-metal or of suitable composition or material.

One object of my invention is to provide an improved vault of the character described and to provide an improved method of manufacturing the same.

A further object of my invention is to provide an improved method and means for moulding the vault so as to insure close and intimate contact between the concrete and the internal lining; and a still further object is to similarly improve the construction of the cover of the vault. Still another object is to provide an internal lining so assembled in position that it is capable of yielding or creeping due to invisible movement caused by the curing or drying of the concrete, the lining being assembled so that it will be and will remain tight to the inside of the concrete walls, and at the same time the flexible assembly of the lining is such that the concrete will not crack or show imperfections after it has dried.

With these and other objects in view the invention consists in the novel construction and arrangement of parts and in the novel method of manufacture hereinafter described, illustrated in the accompanying drawings and particularly pointed out in the appended claims, it being understood that various changes in the form and details may be made without departing from the spirit of the invention or sacrificing any of the advantages thereof.

In the drawings, Fig. 1 is a perspective view of the burial vault with the cover removed;

Fig. 2 is a perspective view of the cover with its under side turned upwards;

Fig. 3 is an end view of the vault;

Fig. 4 is an incomplete enlarged detail section view taken on the line 4—4 of Fig. 3;

Fig. 5 is a cross-section of a metal sheet for the internal lining;

Fig. 6 is a similar view of the same partly prepared with plastic material and bars;

Fig. 7 is a similar view completely prepared for assembly with gravel added to the parts shown at Fig. 6;

Fig. 8 is a horizontal cross-section through the assembled lining;

Fig. 9 is a vertical section taken on the line 9—9 of Fig. 3 and showing one end of the vault and cover;

Fig. 10 is a perspective view showing a part of one form of the internal lining for the vault;

Fig. 11 is a perspective view showing one form of the internal lining with part of the reinforcing means attached thereto;

Fig. 12 is an enlarged detail section showing a portion of the lining in readiness to receive the concrete;

Fig. 13 is a cross-section showing the method of moulding the concrete upon a core member; and,

Figs. 14 to 18 inclusive show modified forms of the means for insuring close and intimate contact between the internal lining and the concrete.

Referring to Figs. 1, 2, and 3 of the drawings, the vault 10 is formed with an internal lining 11 of sheet copper or other suitable metal or material and has a flat upper edge or rim 12 for engagement by the cover, which latter is formed with a concrete portion 13 enclosed within a metallic depending rim 14, and at the under side thereof the cover is formed with a downwardly projecting panel or body 15 having beveled sides and ends 16, the surfaces 15 and 16 being faced with sheet metal or other material and being so dimensioned as to form with the rim 14 a channel or groove 17 for engagement with the upper edge 12 of the vault.

In the manufacture of the vault 10 a core 18 (Fig. 13) is employed in connection with an outer mould 19, between which core and mould the concrete is run so as to cast or mould the vault preferably in an inverted position. The lining 11 in the form of flat plates or sheets is built or assembled upon the said core 18 after the preparation of the sheets in the manner illustrated at Figs. 5, 6 and 7. The lining sheets 11, Fig. 5 are first coated with an asphaltic composition 23, and reinforcing bars 24 are so applied thereto that they are held in place by the composition 23 and serve to brace the sheets and assist in the binding of the concrete to the lining. A coating 28 of coke braize or other gravel like material is then applied to and embedded in the exposed surfaces of the composition 23. In the form shown at Fig. 8 each sheet has one vertical edge butted against the adjacent sheet while the opposite edge projects slightly beyond the edge of the sheet adjacent thereto. The sheets forming the end walls are provided with channel bars 25 aligned with the bars 24, and a binding wire is passed around the bars and through notchers

26' in the sheet edges to hold the sheets in assembled position.

Fig. 10 shows a modified arrangement of lining in which the meeting edges of the plates or sheets are provided with flanges and are connected together by means of U-shaped locking strips 20 (Fig. 6) either integral with or separate from the flanges and these locking strips and the edges of the plates are preferably perforated at 21 so that the perforations in the locking strips and plates may be brought into register to permit the passage of the flowing concrete to ensure a close union. At the mouth of the vault the edges of the sheets or plates forming the internal lining are bent outwardly and then backwardly, as shown at Figs. 9 and 10 so that the backwardly turned flanges 22 may be embedded in the concrete, and the flanges 22 are perforated at 22' to receive the concrete and ensure a firm grip.

Instead of applying the asphaltic composition to the lining sheets 11 before assembly as above described, I may assemble the sheets upon the core 18 and then apply the external coating 23 of asphalt or other plastic adhesive material so as to completely cover the outer surfaces of the lining. The assembled lining may be then provided with the reenforcing bars of channel or other suitable cross-section, the longitudinal bars 24 being aligned with end bars 25 (see Fig. 11), and these bars being secured temporarily in position by the binding wire or the like 26 which encircles the structure. The reenforcing bars 27 are laid upon the uppermost plate 11 which is to form the bottom lining of the vault, and these bars 27 may be held temporarily in position by means of thin metallic straps 27' which are laid over the bars 27 (Fig. 11) and have their ends 27'' bent down and pressed into the asphaltic composition on the side sheets. After assembling of the reenforcing bars 24, 25 and 27 and while the asphalt or other material is still soft and plastic, I may apply a complete coating of gravel, coke braize, broken stone, or similar hard, rough, sharp material 28 (see particularly Fig. 12), which becomes embedded in the plastic composition so that the concrete will adhere firmly thereto. Over the structure thus formed I then mount a complete cage or basket 29 of mesh wire or other suitable reenforcing material of any suitable or well-known openwork construction. The outer mould 19 is then mounted in place and the concrete run into the cavity to complete the formation of the vault with the bottom thereof flush with the upper edges of the outer mould 19.

The method of moulding the cover of the vault is somewhat similar. A suitable core member is provided to receive the metallic portion 15, with the beveled edges 16 extending upward, and the metallic rim 14 is placed around the core; and after the assembly of a suitably wire mesh 30 (Fig. 9) and reenforcing bars 31 which may be suitably attached to the rim 14, the concrete is run into place so as to fill the space between the upper portions of the rim 14, and with the aid of moulds employed in any well-known manner the upper structure of the cover is then formed to any desirable shape or configuration.

While I have found that very satisfactory results have been obtained by the use of the plastic composition and gravel, or the like, for insuring intimate contact between the lining and the concrete, other means for insuring this contact may be employed within the scope of my invention, and other means are illustrated at Figs. 14 to 18 inclusive.

In Fig. 14 the lining 32 which is of smooth sheet copper or other metal or material has secured to its outer face a series of bars or strips 33 having flanges or legs 34 extending outwardly at acute angles to the lining 32 so as to form anchors for the concrete 35, and the member 33 may be secured to the sheet material 32 by brazing, welding, or soldering, or by the use of a suitable adhesive. In the form shown at Fig. 15 the lining member 36 has an inner smooth surface and an outer surface which is roughened or grained to insure an intimate contact of the concrete 37 therewith. In the form shown in Fig. 16 the lining 38 is rolled with a double flange 39, which latter is then bent downward away from a right-angled position, so as to form an anchor within the concrete 40. In the form shown at Fig. 17 the lining 41 is perforated for the introduction of split studs or bifurcated rivets 42, which are adapted to form anchors in the concrete 43, thereby holding the inner lining firmly upon the concrete wall. In the form illustrated at Fig. 18 the lining 44 may be of synthetic stone or molded composition having embedded therein anchor hooks 45 of any suitable form for gripping the concrete 46 and holding the lining in close contact therewith.

When the vault is ready for use a plastic sealing material such as asphalt or cement is applied as at Fig. 4 to the groove or recess 17 in the cover and when the cover is placed upon the vault the plastic material is in the form shown at 47, Fig. 4, but the weight of the cover causes a gradual displacement of the said material into the form shown at 48, Fig. 9, where the vault is effectively sealed.

Although the drawings and the above specification disclose the best modes in which I have contemplated embodying my invention, I desire to be in no way limited to the details of such disclosure, for in the further practical application of my invention many changes in the form and constructional details and in the method of production may be made as circumstances require or experience suggests without departing from the spirit of the invention within the scope of the appended claims.

The term "concrete" is used in this specification and in the claims to define any composition or material capable of being cast or moulded to form a durable, waterproof and strong vault, with cement as the main binder, or with any other suitable or convenient binder that may be known, or may be discovered, to serve the purpose.

What I claim is:

1. A burial vault comprising a lining of sheet material, perforated flange members at the joints between the edges of said material, metallic reinforcing members assembled around the lining without positive connection thereto, means for temporarily holding the reinforcing members in position while assembling and for permitting relative movement of the sheet material at said joints, a concrete layer enclosing said reinforcing members, and means including layers of plastic material and of gravel-like material engaging the entire inner surface of the concrete for insuring close contact between the concrete and the said lining while permitting relative movement of the parts due to variations in expansion during the setting and curing of the concrete.

2. A burial vault comprising a lining of sheet material, free perforated edges on the lining, sliding joints for temporarily and yieldingly con-

necting adjacent edges together, a concrete body surrounding the lining and a coating of plastic and of gravel-like material between the concrete and the entire outer surface of the lining for insuring a permanent bond therebetween, while permitting movement due to inequalities in expansion of the materials during the curing of the concrete.

3. A burial vault of the character described comprising vertical concrete side and end walls, an internal lining in relatively movable sections, layers of binding and of gravel-like material completely separating the said lining from the concrete, horizontal flanges on said lining extending along a portion of the upper edge of the said walls, outer vertical depending flanges formed on the horizontal flanges and embedded in the concrete and perforations in the depending flanges to anchor same in the concrete.

4. A burial vault of the character described, comprising a complete internal sectional lining of sheet material, means on the entire outside of said lining for insuring close adherence to the concrete while permitting relative movement of the sections of the lining during the curing of the concrete, reinforcing metallic bars extending entirely around the lining, tie members securing the lining and bars in position without positive connection to the lining, a complete metallic mesh reinforcing cage enclosing said reinforcements, U-shaped joint members holding the adjacent edges of the lining in relatively slidable relation, and a concrete wall extending from said lining to and forming the outer surface of the vault.

5. A unitary member for use in forming the lining of a concrete vault, comprising a flat section of thin sheet metal, to form one face of the internal lining of the vault, a plastic composition on one side thereof, rigid bracing bars applied to and held by the plastic composition without positive connection and a gravel-like material applied to the entire exposed surfaces of the plastic material on the sheet metal and embedded therein to insure a permanent bond between the lining structure and the concrete wall of the vault.

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