Oct. 20, 1953 J. A. RENCH 2,655,714

BURIAL VAULT

Filed April 25, 1950

Fig. 1.

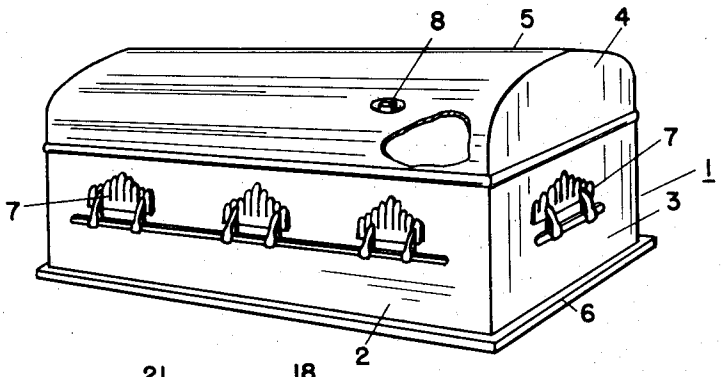


Fig. 2.

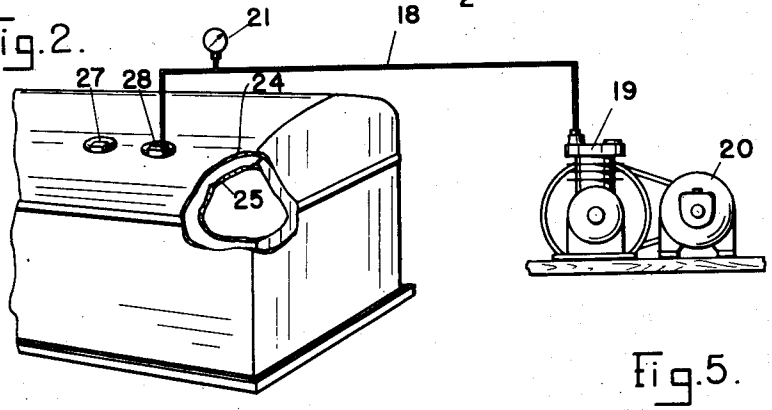


Fig. 5.

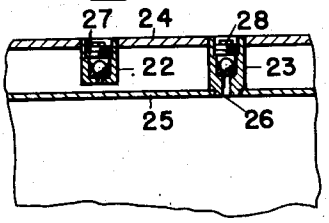


Fig. 3.

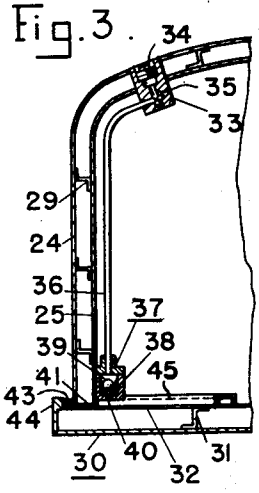


Fig. 4.

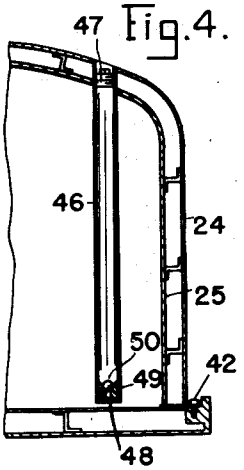


Fig. 6.

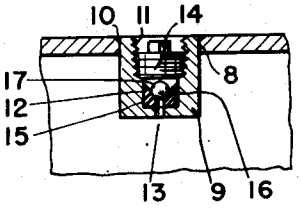
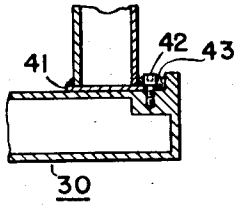


Fig. 7.



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BURIAL VAULT

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The present invention relates to burial vaults, more particularly to those made of metal or specially treated concrete, and for containing a metal or wood casket. The vault and its contained casket may be positioned either above or below ground.

It has been found that notwithstanding all attempts to maintain the interior of the vault free from gas or moisture-producing material, the air or gas remaining in the vault and/or casket may cause the generation of moisture and the encouragement of fungus growth. These effects bring about corrosion of metal, rotting of the wood, and weakening of the concrete parts.

The primary object of the invention is to provide a burial vault in which the rate of deterioration of the casket, whether made of metal or wood, is substantially slowed down over a long period of time.

Another object is to provide a burial vault in which the casket and contained body are preserved for an indefinite period of time.

Still another object is to provide a burial vault in which the growth of fungi and other thallophytic plants is discouraged and the interior of the vault remains free from deteriorating or gas-producing material.

The final object is to provide a composite structure including an outer protective housing, single or multi-walled, and a casket, in which the structure and contents withstand the ravages of time, acid effects of the ground, and/or the oxidizing effects of the atmosphere.

The above objects are attained in brief by providing a hermetically sealed vault and removing all gases and moisture therefrom after the casket has been laid therein. As a modification, I may provide a double or multi-walled vault and evacuate the inter-wall space or spaces before receiving the casket, and then evacuate, at the graveside, the space immediately surrounding the casket. This highly evacuated space or spaces are then ready to receive whatever gas or moisture that is emitted from the casket over a period of time, and the net gas content is sufficiently low as to prevent corrosion and discourage the growth of plant life.

Other objects and features will be apparent as the following specification is perused in connection with the accompanying drawings, in which:

Figure 1 is a perspective view of a single-walled vault embodying the principles of the invention;

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Figure 2 is a perspective view, partly cut away, showing the application of the invention to the double or multi-walled type of vault;

Figure 3 represents a fragmentary cross-sectional view of the double-walled vault shown in Figure 2 and depicting more in detail the evacuating apparatus within the vault;

Figure 4 depicts a view similar to Figure 3 but at the other side of the vault and employing a different type of evacuating conduit and valve;

Figure 5 shows a fragmentary longitudinal section of the double-walled vault with valves entering the interior of the vault and the inter-wall space;

Figure 6 exemplifies the use of a valve inserted into a single-walled vault; and

Figure 7 is a fragmentary sectional view of the lower portion of the vault showing the manner in which the metal parts can be sealed together after receiving the casket.

Referring to Fig. 1, reference character 1 generally designates a metal vault formed of two sides 2 and two ends 3 with a top portion 4 of any desired form, but exemplified as being roof-shaped with a ridge 5 in order to shed water in case the vault is exposed to rain. The housing or vault 1 is adapted to be fitted over a metal plate 6 which may be provided with upstanding flanges for locating the interior surfaces of the vault. If desired, the outer edge of the plate 6 can also be supplied with a flange and the walls 2, 3 fitted within the peripheral groove formed of these flanges.

The vault 1 and its plate support 6 are preferably made of a fine grade stainless steel and, in order to reduce the rate of oxidation, the steel may be coated inside and out, if desired, with porcelain or with zinc. In limited cases, the vault can be made of solid copper and, if desired, of thin-walled concrete, reinforced and suitably treated on the inside and outside with tar or other water-impermeable substances.

When the vault is made out of metal and before the porcelain is applied, the housing is conveniently pressed out of sheet metal by a deep drawing press in order to eliminate any joints at the ends. However, it is to be understood, particularly when the casket is to be inserted into the end of the vault, one or both end walls 3 may be formed separately from the side walls 2 and the roof, these end walls being provided with flanged edges which fit snugly within the main portion of the vault and can be either welded or silver-soldered at the flanges

in order to form an integral structure. The handles 7 are detachably affixed to the vault in any suitable and well known manner, and mainly used for ornamentation purposes.

When interring a casket the usual practice is to leave the vault above ground and the upper portion thereof removed from the plate 6 for receiving the casket. At the appropriate time the main portion of the vault is placed on the plate 6, using the handles 7 for lifting purposes, and the metal vault is then affixed as by screws (not shown in Fig. 1) to the plate 6. Thereafter, and in accordance with one feature of my invention, silver-solder is poured in the space between the walls and the outer flange of the plate 6 and if desired a layer of tar applied in order to provide a perfect hermetic seal at the joint between the lower edge of the walls, 2, 3 and the plate 6.

It has been found that when the ordinary vaults made of metal are employed for encasing a casket, a great deal of moisture collects within the vault over a period of time and this moisture promotes the growth of fungi and similar plants, also tending to cause deterioration of the metal of the vault and the joints between the vault housing and the bottom plate.

In accordance with another feature of my invention, I provide a highly evacuated space between the casket and the vault walls and if the casket itself is not hermetically sealed, this vacuum extends into the casket. For this purpose an opening 8 is provided in the top of the vault (Fig. 6) and this opening receives a metal plug 9, the latter being welded at the edge 10 in order to assure a hermetic joint. The plug 9 is provided with a pair of countersunk holes 11, 12 and the latter communicates with the interior of the vault through a small opening 13. The hole or recess 11 is provided with threads in order to receive a screw plug 14 and the lower hole 12 is provided with a plug of rubber 15 which has a central opening in line with the aperture 13.

The upper end of the plug 15 is given a conical reentrant shape as indicated at 16 for receiving a metal ball 17 of hardened steel which normally fits over the central opening in the plug and prevents communication to or from the interior of the vault.

After the casket has been placed on the plate 6 and the top portion of the vault 1 has been placed over the casket and sealed to the plate in the manner explained hereinbefore, or in any other suitable manner, the screw plug 14 is removed and the end nipple of a suction pipe 18 (illustrated in Fig. 2 in connection with the modified form of vault) is screwed to the threads vacated by the plug.

The pipe or line 18 passes to the suction side of a vacuum pump 19, of any suitable and well known type, which is operated by an electric motor 20. A combined pressure-suction gauge 21 may be contained in the line 18. Thus as the pump continues to operate, a relatively high vacuum is produced within the vault and if there are any openings present in the casket the air is also evacuated from the casket interior. But the main object of the invention is to evacuate the space surrounding the casket since this space is usually of much greater content than that contained in the casket and for that reason can offer far more deteriorating effects than the air or gas within the casket. The vacuum should be carried as high as possible when using commercially available high vacuum pumps and the operation of the latter and the vacuum conditions within the vault can be read from the gauge 21.

When all of the remnant air, gas and moisture have been removed from the vault interior, the pipe 18 is disconnected and it will be found that the ball 17 will drop down into the conical hole to shut off all further communication with the vault interior. In other words, the ball 17 serves as a check valve and, due to the rubber seat 15, forms a perfect hermetic seal. The plug 14 can then be re-inserted and after the handles 7 have been removed, the vault is ready to be placed either in the ground or in a mausoleum.

In case the vault is made of concrete, the interior and exterior surfaces should be tarred or otherwise rendered impermeable to air and moisture and a suitable provision can be made for inserting the metal plug 9 for effecting the evacuation of the vault interior.

It has been found that when the interior of the vault, as described, is sufficiently highly evacuated, any gases or moisture given off at the casket are so highly diffused throughout the vault interior that little or no deteriorating effect is noticeable, since the high vacuum provides a protective media and many of the causes for deterioration of the casket and vault from within have been eliminated. Besides, the absence of the normal air content serves to a certain degree to thermally insulate the casket and contents which additionally reduces the ravages of a soil which may be temporarily above normal temperature. The process of evacuating the vault interior is not expensive since, obviously, the vacuum pump can be carried on a truck and moved from one graveside to another with maximum facility and lack of attention after the connections have been made.

My invention is not limited to a single-walled vault but can be readily applied to a double or other multi-walled unit as shown in Figs. 2, 3, 4, 5 and 7. In Fig. 5 there are two metal plugs 22, 23 employed, these plugs being made similar to the plug 9 shown and described in connection with Fig. 6, except that one plug 22 terminates in the space between the walls 24, 25 of the vault, and the other plug 23 terminates at the interior of the vault indicated by the opening 26. When the screw plugs 27, 28 have been removed from the respective evacuating plugs 22, 23, twin suction pipes (not shown) may be taken to the vacuum pump 19 or, if desired, the interior of the wall 25 can be first evacuated and then later the space between the walls, by removing and reinserting the proper screw plugs 28, 27. A single conduit 18 may also be employed with a twin or forked suction nipple structure, in which case a single gauge 21 can determine the vacuum conditions throughout the interior of the vault.

The walls of the double-walled vault can be separated the requisite distance apart by means of longitudinal angle irons 29 (Fig. 3) and the plate on which the double-walled vault is mounted may also comprise a two-walled structure indicated at 30, separated from one another by the angle irons 31. Openings 32 may be provided in the upper wall of the plate 30 in order to evacuate the air between the two walls of the double bottom plate.

Instead of evacuating the space immediately surrounding the casket by means of the plug 23 (Fig. 5) which withdraws the air from the top of the vault, it may be desirable to evacuate from the bottom of the vault, particularly in case the plate 30 is formed with a double shell. This can

be accomplished by providing a plug 33 which extends through the double wall of the vault at the top and is provided with the screw plug 34 as in the case of the plug shown in Fig. 6. But the opening 35 at the bottom of the plug communicates through a copper conduit 36 with a valve 37 secured to the side of the inner wall of the vault at the bottom. This valve comprises a housing containing the rubber sealing plug 38 and the ball 39. An opening 40 passes through the rubber plug and through the bottom of the valve to communicate with the interior of the vault. Thus when the screw plug 34 is removed and a pump connected thereto, the interior of the vault, as well as the interior of the double-walled bottom plate, is evacuated.

It will be understood that if desired a plug 22 (Fig. 5) may be employed to evacuate the inter-wall space, as was explained in connection with that figure, although in general, the manufacturer of the double-walled vault would normally evacuate the inter-wall space at the factory and might also evacuate the space between the two walls of the bottom member 30. In case the inter-wall space is evacuated before the vault is delivered, a plate 41 is welded to the lower edges of the vault in order to seal the inter-wall space, and this plate can then serve as a securing means to the bottom plate 30 by the use of screws 42 (Fig. 4), or if desired, solely by depositing silver-solder 43 in the space between the outer wall of the vault and the flange 44 formed on the bottom plate. It will be understood that when screws 42 are employed, there may be additionally supplied a covering of silver-solder or a tar coating in order to assure a perfectly tight hermetic joint.

The remote position of the valve 37 from the plug 33 offers some advantages over the use of the plug 23 (Fig. 5) at the top of the vault in that the suction effects of the vacuum pump 19 are carried in a more concentrated form through the conduit 36 to a position near the bottom plate and for that reason is more apt to pick up any moisture collected on the bottom. In order still further to assure the complete disposal of condensed moisture on the bottom plate, conduits 45 may be taken from the opening 40 and terminating at various points throughout the bottom of the vault in order more effectively to pick up moisture as well as to evacuate the lower strata of air. These conduits also serve the additional purpose of strengthening the bottom plate in the longitudinal and transverse directions, depending upon their arrangement, since they can be secured in any suitable manner, as by welding, to the bottom member.

In Fig. 4 there is shown still another optional manner in which the evacuating conduit can be taken out of the vault interior. In this case a vertical pipe 46 extends along one end of the vault and is provided at its upper end with screw threads for receiving a plug 47. The lower end is closed except for an aperture 48 and this end contains an apertured rubber plug 49 and a steel ball 50. Inasmuch as the pipe 46 runs along one end of the vault, it is out of the way of the casket and obviously, in case the vault is intended for end insertion of the casket, the pipe is positioned at that end which would not normally be disturbed. It will be understood that as in the case of Fig. 3, a plug 22 may be employed to evacuate the inter-wall space, as was explained in connection with Fig. 5, although if desired, the manufacturer of the vault will already have evacuated this space before the vault is delivered.

From the foregoing it is evident that I have disclosed a highly evacuated, hermetically sealed vault having one or more walls in which the vacuum extends to the space immediately surrounding the casket, as well as to the inter-wall space. The evacuation process can be performed at the graveside and the high vacuum serves to protect not only the interior of the vault from corrosion, growth of thallophytic plants and other deteriorating effects, but also helps in preserving the casket which may be constituted of wood or metal.

If desired, the vacuum treatment can be given the vault at predetermined times after interment to assure a highly evacuated condition of the interior of the vault, as it would only be necessary to expose the plugs 27, 28 for this purpose.

The invention is not limited to vaults made of metal but can be applied to vaults made of any other material such as plastic, wood or concrete, provided such material is impermeable to gas and moisture or can be made impermeable by suitable coatings and treatments.

It will be understood that various modifications and arrangements in structure could be made without departing from the spirit of my invention and, accordingly, I desire to comprehend such modifications and substitutions of equivalents as may be considered to come within the scope of the appended claims.

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

1. A burial vault having an evacuating apertured plug in the upper portion of a wall thereof, and a check valve structure secured to the bottom portion of the wall within the vault to evacuate air and moisture from the surface of said bottom wall portion, and a conduit extending between said plug and said structure, and a plurality of evacuating pipes extending along the bottom of the vault and communicating with said valve structure.

2. A burial vault comprising a container for a casket, said container having walls spaced apart and sealed to a bottom plate member, hollow reinforcing ribs extending along said plate member, the interior of said ribs communicating at various points over the bottom plate member with the interior of said container, an evacuating apertured plug in the upper portion of the container, and an evacuating conduit extending between said plug and the interior of said ribs.

3. A burial vault comprising a container for a casket, said container having walls spaced apart and sealed to a bottom plate member, hollow reinforcing ribs extending along the plate member, openings through said ribs to place the interior thereof in communication with the interior of the container, and means for evacuating the interiors of the container and the ribs.

4. A burial vault for a casket, said vault comprising an inverted U-shaped portion and a bottom plate member, said U-shaped portion having walls spaced apart, and a closure member extending between and sealed to the walls at each side of said portion to hermetically enclose the space between the walls of said portion, and means for evacuating the space between said walls, said bottom plate member being secured to said U-shaped portion at the position of the closure members.

5. A burial vault for a casket, said vault comprising an inverted U-shaped portion and a bottom plate member, said U-shaped portion having

walls spaced apart, and a closure member extending between and sealed to the walls at each side of said portion to hermetically enclose the space between the walls of said portion, said bottom plate being secured to said U-shaped portion at the position of said closure members, said bottom plate having walls spaced apart to leave a chamber within the walls of said plate, said chamber being in communication with the interior of the vault as determined by the space contained within the inner wall of the vault, and means for evacuating the inter wall space of the U-shaped portion, and means for evacuating the space defined by the inner wall of said portion and the interior of said bottom plate.

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