July 19, 1927. 1,636,322

W. C. O'LEARY

VACUUM WALL RECEPTACLE

Filed Aug. 28, 1924

Fig. 1.

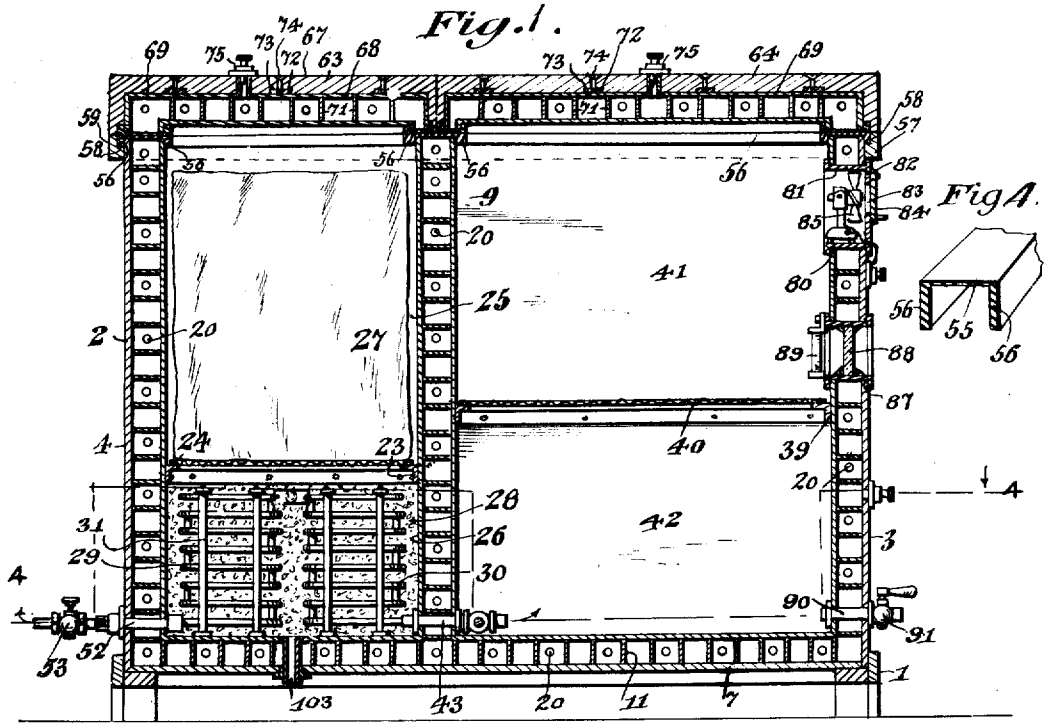


Fig. 4.

Fig. 2.

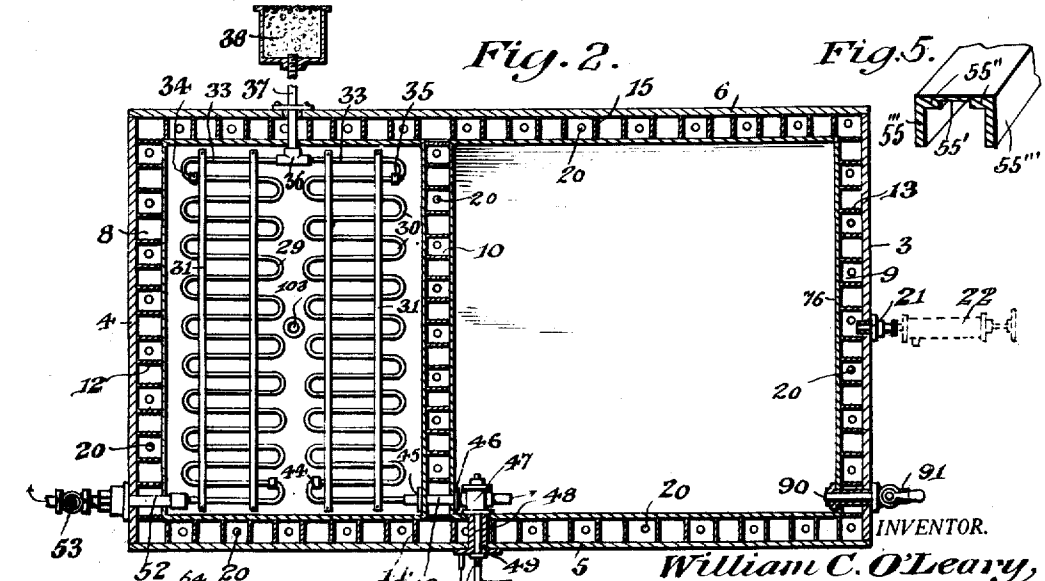
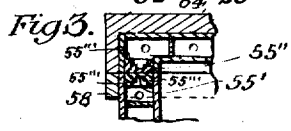


Fig. 5.

Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM C. O'LEARY, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR OF ONE-FOURTH TO JOSEPH R. PUMPHREY AND ONE-EIGHTH TO LUCIEN GEORGE BERRY, BOTH OF WASHINGTON, DISTRICT OF COLUMBIA.

VACUUM WALL RECEPTACLE.

Application filed August 28, 1924. Serial No. 734,705.

This invention relates to vacuum wall receptacles of that type including an open top body portion and a cover therefor, and has for its object to provide, in a manner as hereinafter set forth, a body portion, as well as a cover of the receptacle, with a vacuum space closed by a sealing strip of low conductivity and of minute thinness whereby when the strip carried by the cover is positioned against the strip carried by the body portion a substantially continuous vacuum space is provided throughout the cover and body portion.

Further objects of the invention are to provide, in a manner as hereinafter set forth, a vacuum wall receptacle, which is simple in its construction and arrangement, durable, thoroughly efficient and convenient in its use, readily set up, and comparatively inexpensive.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts, as hereinafter more specifically described and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:—

Figure 1 is a vertical sectional view of a vacuum wall receptacle in accordance with this invention.

Figure 2 is a section on line 4—4 of Figure 1.

Figure 3 is a fragmentary view, in vertical section, illustrating a modified form of edge insulation for the contacting ends of the vacuum chambers.

Figures 4 and 5 are fragmentary views in perspective, respectively, of preferred and modified forms of edge insulation of sealing members.

Referring to the drawings in detail, 1 denotes a base, upon which is supported a housing, referred to generally by the reference character 2 and in which are arranged two sets of air cooling coils and refrigerating agents employed for cooling the air as it travels through each set of coils.

The housing comprises side walls 3, 4, a front wall 5, a rear wall 6, and a bottom 7. The walls 3 to 6 and bottom 7 are formed of sheet metal of substantial height and suitably connected together. The side walls 3, 4, are of less width than the length of the walls 5, 6. When the walls 3 to 6 and bottom 7 are secured together, they provide a housing or receptacle of rectangular contour.

Arranged within the housing 2 is a pair of spaced metallic tanks 8, 9, and said tanks are not only spaced from each other a substantial distance, but also a substantial distance from the bottom and walls of the housing 2. The tank 8 is rectangular in contour and extends lengthwise with respect to the width of the housing 2. The tank 9 is square in contour and of greater size than the tank 8. The tanks 8 and 9 are of the same height, oppose each other, and arranged between the opposed walls of the tanks is a spacing element 10, in the form of grating. Interposed between the bottoms of the tanks 8, 9 and the bottom 7 is a combined supporting and spacing element 11, in the form of a grating, for the tanks. Interposed between the tank 8 and the side wall 4 is a spacing element 12, in the form of a grating. Interposed between the tank 9 and the side wall 3 of the housing is a spacing element 13, in the form of a grating. Interposed between the tanks 8, 9 and the front wall 5 of the housing 2, is a spacing element 14, in the form of a grating, and interposed between the rear wall 6 of the housing 2 and the tanks 8, 9, is a spacing element 15, in the form of a grating.

The elements 11, 12, 13, 14 and 15 are constructed in the same manner, and each consists of intersecting oppositely extending flat bars of substantial width and thickness. The oppositely extending bars which pro-

vide each spacing element are provided with openings 20.

The tanks 8, 9, in connection with the housing 2, provide a vacuum space and the spacing elements act as bracing means for the walls of such space. The openings 20 formed in the oppositely extending bars of each spacing element establish communication between the spaces formed by said bars in connection with the tanks and walls of the housing.

A normally closed valvular element 21 is connected to the wall 3 and to said element 21 can be attached a pump, as indicated at 22 for creating a vacuum in the closed spaces formed by the housing, tanks and gratings.

Secured within the tank 2, a substantial distance above the bottom thereof, is a support 23, upon which is mounted a foraminous partition 24, and said support 23 and partition 24 provide the tank with an upper refrigerant chamber 25 and a lower chamber 26 for the reception of a refrigerant and two sets of air cooling coils. The refrigerant mounted in the chamber 25 is indicated at 27, and is in the form of a block of ice. The refrigerant arranged within the chamber 26 is in the form of shaved ice and salt and which is indicated at 28.

The sets of cooling coils, which are arranged in the chamber 26, are indicated at 29, 30, and are completely enveloped by the refrigerant 28.

Secured to the bottom of the tank 1, is a pair of suspension devices for the cooling coils. The suspension devices are indicated at 31 and one suspends the set of coils 29 and the other the set of coils 30 within the chamber 26.

Arranged within the chamber 26, at a point in proximity to the support 23, is an air conducting pipe 33, which has one end communicating with the upper coil of the set of coils 29, as at 34, and its other end connected to the upper coil of the set of coils 30, as at 35. Extending through the rear wall 6 and opening into a T-coupling 36 attached to the pipe 33, is an air supply pipe 37, having its outer end provided with an air filter 38. The air to be cooled is first passed through the filter 38 and then supplied to the sets of coils through the medium of the pipes 33 and 37. The filter 38 opens into the atmosphere and can be of any suitable construction. The pipe 37 not only extends through the wall 6 of the housing 2, but also through the spacing element 15 and through an end wall of the tank 8 and into the chamber 26. Suitable means is provided to set up an air tight joint for the pipe 37 between the housing 2 and tank 8.

Arranged within the tank 9, a substantial distance above the bottom thereof, is a support 39 carrying a foraminous partition 40, which divides the tank 6 into an upper storage chamber 41 and a lower cold air receiving chamber 42. The chamber 41 is adapted to receive articles of food, and the cold air supplied to the chamber 42 acts as a preservative or a refrigerant for the articles contained in the chamber 41. The cold air is supplied to the chamber 42 through the medium of a valved supply pipe 43, which extends from the chamber 26, through the spacing element 10 and into the chamber 42, at the bottom thereof. The pipe 43 is connected, as at 44, to the lower coil of the set of coils 30, and has an air tight connection, as at 45, 46 with the tanks 8 and 9 respectively. The pipe 43 projects a substantial distance within the chamber 42 and carries a cut-off valve 47, having a stem 48 projecting through a bearing element 49, and further projecting exteriorly of the wall 5 of the housing 2, as at 50, to enable the manual operation of the valve 47 when occasion requires. The outer end of the element 49, which is arranged exteriorly of the wall 5 of the housing 2, is provided with a stop 51 for limiting the movement of the stem 48.

Connected to the lower coil of the set of coils 49 and projecting outwardly from the wall 4 of the housing 2, is a cold air supply pipe 52 having its outer end provided with a cut-off valve 53, and to the latter is secured a cold air conducting pipe 54.

The top of the space formed between the tanks 8 and 9 and that between the tanks and the housing 2 are closed by sealing members or strips, termed edge insulation and constructed of material of very low conductivity preferably rubber. The sealing strips are very thin and formed with flanges. With reference to Figure 4 the sealing strip is indicated at 55 and the flanges thereof at 56. With reference to Figure 5 the sealing strip is indicated at 55′ formed with lateral enlargements 55″ terminating in flanges 55‴. When the form shown in Figure 4 is used, it is mounted in overlapping position, see Figure 1, and when the form shown in Figure 5 is employed it is mounted in the top of the space, see Figure 3.

Secured to the walls 3 to 6 of the housing 2, at the top thereof, is a frame 57 constructed preferably of wood, and with each of the frame members thereof angle-shaped in the cross section to provide a vertical leg 58 and a horizontally disposed leg 59, which extends inwardly at right angles with respect to the lower end of the leg 58 thereby providing a pocket 58′ for an outer flange 56 of a sealing member. The leg 58 snugly abuts against the outer face of the housing 2.

The housing 2 is provided with a pair of hinged covers referred to generally by the reference characters 63, 64. The cover 63 is employed for closing the tank 8, and the cover 64 for the tank 9. The cover 63 is

hinged to the frame 57, as at 65, and the cover 64 is hinged to the frame 67, as at 66. The cover 63 is of less size than the cover 64, see Figure 1, but as the construction of each of the covers is the same, but one will be described as the description of one will apply to the other. Each of the covers consists of an upper section 67 and a lower section 68. The section 67 is larger than the section 68, and the latter extends into, depends from and is secured to the section 63. The section 67 has its lower face formed with a rectangular recess 69 of a size greater than the size of that tank with which the cover cooperates. The section 67 is constructed preferably of wood, and the section 68 of metallic material. The section 68 is formed from two flanged spaced plates to provide a shallow casing 70, having arranged therein a spacing element in the form of a grating 71. The casing 70 has its upper face formed with ribs 72, which seat in pockets 73, and engaging with the ribs 72 are hold-fast devices 74, which extend through the section 63 and engage in the ribs 72, and by this arrangement the two sections of the cover are secured together.

The spaces formed between the flanges of the plates which provide the shallow casings 70 have their open ends closed by sealing members or strips 55. See Figure 1.

The vacuum chambers formed between the housing and tanks, and between the tanks, as well as those formed by the casings 70 are closed by the thin sealing strips of low conductivity, which as before stated are termed edge insulation. The sealing strips carried by the housing abut against the sealing strips carried by the covers, so that the vacuum spaces or chambers would be continuous, if not separated by these thin septums or strips and by this arrangement the vacuum is substantially continuous throughout the housing and cover.

When the covers are mounted in position, they are seated on the frame 57 and the flanges of the inner strip carried thereby, and the sections 67 of the covers, when these latter are in closure position, seat on the sealing members 55 of the housing 62. Each of the covers is provided with a normally closed valvular element 75, to which can be attached suitable means, such as a pump to form a vacuum in the casing 70.

The wall 3, as well as the wall 76 of the tank 9 which opposes the wall 3 of the housing 2, is provided with an opening, and the said openings oppose each other and are indicated at 80. Mounted in the openings 80 is a flanged casing 81, open at its rear and having its front wall, as indicated at 82, provided with an outlet 83, normally closed by a slide 84. The casing 81 opens into the chamber 41 and has arranged therein an electrically operated suction device 85, which is connected with and controlled by a switch 86, carried by the housing 2.

Below the openings 80, the wall 76 of the tank 9, as well as the wall 3 of the housing 2, is provided with an opening, and the said openings align and are indicated at 87. Closing the openings 87 is a sight glass 88, which is arranged forwardly with respect to a thermometer 89, positioned within the chamber 41. By this arrangement one can readily ascertain the temperature within the chamber 41.

Secured to the wall 76 of the tank 9, as well as the wall 3 of the housing 2, is a short pipe 90, which has its inner end communicating with the chamber 42 and its outer end provided with a cut-off 91. The pipe 90, when the cut-off is open, is employed for supplying air at atmospheric temperature or hot air into the chamber 42 for increasing the temperature therein, as well as the temperature in the chamber 41, and when this step is had, the slide 84 is shifted to open the outlet 83 and the suction device then operated whereby air at atmospheric pressure or warm air will be drawn through the chambers 41, 42 for the purpose of increasing the temperature therein and after the temperature in the chamber 41 has been increased to the desired degree, which can be ascertained from the thermometer 89, the cut-off 91 is closed, outlet 83 closed and the operation of the suction device 85 discontinued. The chamber 26 is provided with a drain 103.

The walls of the housing, as well as the walls of the tanks, when the vacuum is formed, are prevented from collapsing in view of the elements 10 to 15 interposed between the tanks and the tanks and the housing, and this statement also applies to the covers.

It is thought that the many advantages of a cooling system in accordance with this invention, can be readily understood, and although the preferred embodiment of the invention is as illustrated and described, yet changes in the details of construction can be had which will fall within the scope of the invention as claimed.

What I claim is:—

1. In a receptacle, a vacuum chamber having one of its walls formed from an imperforate thin septum of low conductivity and providing an insulation, the said wall being materially less in thickness than any one of the other walls of said chamber.

2. In a receptacle, a vacuum chamber having one of its walls formed from an imperforate thin septum of low conductivity and providing an insulation, the said wall being materially less in thickness than any one of the other walls of said chamber, and bracing means within said chamber for the walls thereof.

3. In a receptacle, abutting elements forming a pair of chambers each having one end open and providing when said end is sealed a vacuum space, the open end of one chamber opposing the open end of the other, and an imperforate septum of minute thinness for sealing each of said ends, said septums abutting and with the abutting portion thereof of a combined thinness to provide for said spaces to be substantially continuous and providing an edge insulation for each of said elements.

In testimony whereof, I affix my signature hereto.

WILLIAM C. O'LEARY.

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WILLIAM C. O'LEARY.

CERTIFICATE OF CORRECTION.

Patent No. 1,636,322. **Granted July 19, 1927, to**

WILLIAM C. O'LEARY.

It is hereby certified that the above numbered patent was erroneously issued to the inventor, said "O'Leary, and one-fourth to Joseph R. Pumphrey and one-eight to Lucien George Berry", as assignees, whereas said Letters Patent should have been issued to the inventor, said "O'Leary, one-fourth of one per cent to Joseph R. Pumphrey and one-eight of one per cent to Lucien George Berry, both of Washington, District of Columbia," as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 19th day of August, A. D. 1927.

Seal.

M. J. Moore,
Acting Commissioner of Patents.

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