J. E. STARR & C. C. PALMER.

POWDER OR EXPLOSIVE MAGAZINE FOR WAR SHIPS.

APPLICATION FILED JAN. 23, 1913.

1,161,992.

Patented Nov. 30, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

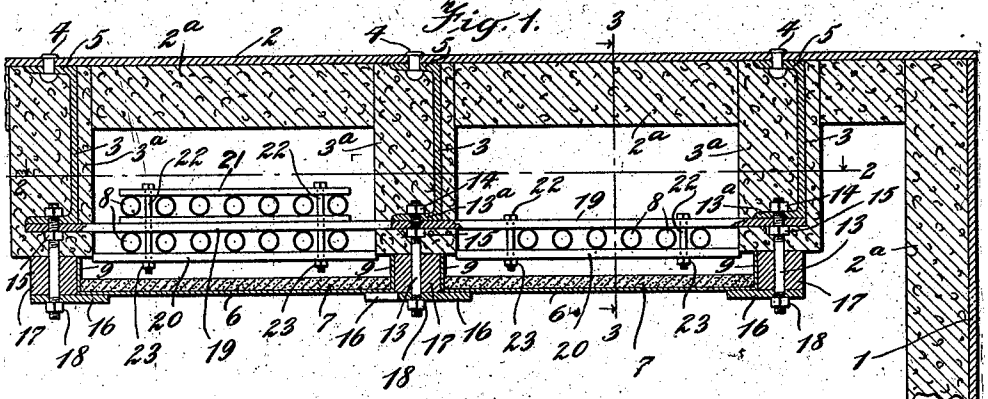


Fig. 3.

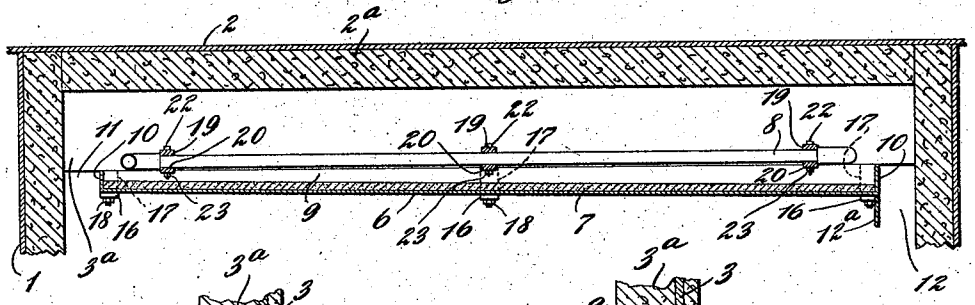


Fig. 4.

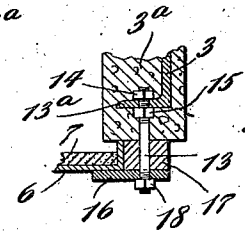
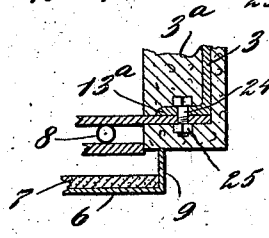


Fig. 5.



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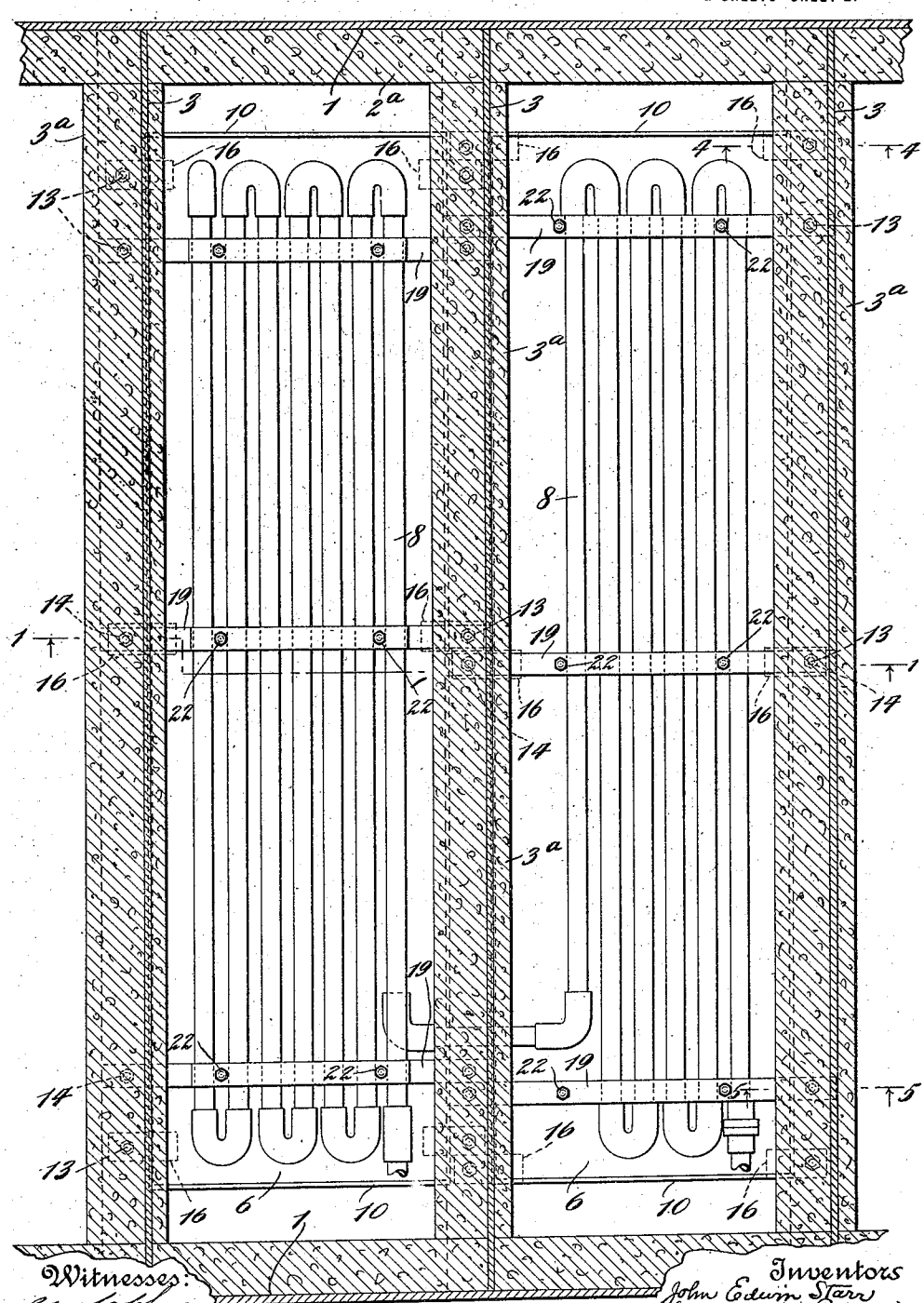
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Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN EDWIN STARR AND CASSIUS CLAY PALMER, OF NEW YORK, N. Y.

POWDER OR EXPLOSIVE MAGAZINE FOR WAR-SHIPS.

1,161,992. Specification of Letters Patent. Patented Nov. 30, 1915.

Application filed January 23, 1913. Serial No. 743,734.

To all whom it may concern:

Be it known that we, JOHN EDWIN STARR and CASSIUS CLAY PALMER, citizens of the United States, residing at New York city, borough of Manhattan, in the county of New York and State of New York, have invented certain new and useful Improvements in Powder or Explosive Magazines for War-Ships, of which the following is a specification.

Our invention relates to new and useful improvements in powder or explosive magazines for warships, and more particularly to the structures disclosed in the United States Letters Patent of John Edwin Starr No. 1,079,069, dated November 18, 1913, and Cassius Clay Palmer No. 1,079,070, dated November 18, 1913. In the above Letters Patent granted to us is shown and described a construction embodying a cooling conduit or pipe system arranged between the deck beams and beneath which conduit or system is provided a pan or receptacle forming with the deck and deck beams a duct for circulation of air in the magazine, said pan also serving to catch water of condensation which may drip from the outer surface of the cooling conduit or system, and it is the object of this present invention to provide improved and simplified means for mounting or securing the said conduits, and the said pan or receptacle in operative position.

The invention consists in the construction of parts and their arrangement in combination to be more fully described hereinafter and the novelty of which will be particularly pointed out and distinctly claimed.

We have fully and clearly illustrated the invention in the accompanying drawings to be taken as a part of this specification and wherein:

Figure 1 is a section taken on the line 1—1 of Fig. 2. Fig. 2 is a section on the line 2—2 of Fig. 1, parts being shown in plan. Fig. 3 is a section taken on the line 3—3 of Fig. 1. Fig. 4 is a detail sectional view taken on the line 4—4 of Fig. 2. Fig. 5 is a detail sectional view taken on the line 5—5 of Fig. 2.

Referring to the drawings by characters of reference, 1, 1 designate the vertical side walls of a magazine chamber, and 2 designates the deck plate which also constitutes the roof or ceiling of the magazine, the deck plate being supported on horizontal deck or ceiling beams 3, preferably channel irons. The deck beams, as appears from Fig. 1, are arranged with their webs vertical, the deck plates being secured by rivets 4 to the upper flanges 5 of the deck beams.

The inner faces of the side wall 1, and the deck plate 2, are covered with suitable heat-insulating material 2^a so as to protect the interior of the magazine from exterior heat influences, so that the temperature within the magazine may be more easily maintained uniform or at a desired temperature.

The beams 3, it will be noted, project below the inner surface of the ceiling, as is apparent from Fig. 1, and are insulated with heat-insulating material 3^a, such as cork, to prevent conduction of the heat through contact of the beams with the iron deck, through the mass of the beam and into the magazine.

Beneath the deck beams 3 and supported therefrom in a manner to be presently described are placed the pans 6, preferably made of steel, each of which is insulated on the inner face of its bottom by a layer of water-proof heat-insulating material 7, such as a composition of ground cork and pitch. This insulation prevents the pans from being chilled by the refrigerating coils 8 below the dew point of the magazine and thereby prevents the condensation of moisture on the underside of the bottom of the pan.

The pans above mentioned are preferably oblong in shape and are provided with longitudinal upstanding side flanges 9 and end flanges 10 which retain any moisture which may be condensed on the refrigerating pipes and may drip therefrom. The pans bridge the space between each two adjacent deck beams, and each pan is arranged so that its said side flanges 9 contact the cork covering 3^a of the deck beams so that the said flanges make an air and fluid tight joint between each pan and the deck beams, whereby each pan, with the deck beams and ceiling, form an air duct across the upper end of the magazine. The upper edges of the longitudinal flanges of the pans are inclined lengthwise relative to the bottoms of the pans, as shown in Fig. 2, so that, when the pans are secured in place, the bottoms of the pans will be inclined from one end to the other, as shown in Fig. 3. The pans described are preferably of a length less than the distance from wall to wall of the magazine taken lengthwise of the deck beam, so that spaces 11, 12 are provided at the ends of the pan

providing an inlet and an outlet to the air duct formed by each pan. The lower end of each pan is provided with a depending flange 12ª forming with the adjacent wall of the magazine an outlet or downtake passage which, with the incline of the pan, facilitates the flow of air through the ducts.

We have above briefly described a construction appearing in the applications above referred to, so that the application and construction of the present improvements may be fully understood.

We will now proceed to describe the improved means for securing the pans in the positions above set forth. This means comprises hangers, preferably in the form of bolts 13 let through apertures in the lower lateral flanges 13ª of the deck or ceiling beams 3, said bolts being threaded at their opposite ends as clearly shown in Figs. 1 and 4, and rigidly clamped by nuts 14, 15 threaded on the upper ends thereof, respectively above and below the said flange. These bolts extend from the flange 13ª down through the cork covering of the deck or ceiling beams, and carry at their lower ends clamping plates 16 which extend inwardly beneath the bottom of the pan, a spacing block 17 being interposed between the portion of each plate 16 about the bolt 13 and the lower face of the cork covering for the deck beam. The clamping plates 16 and the spacing blocks 17 are each clamped in place against the covering of the deck beam by means of a nut 18 threaded onto the lower end of each hanger bolt. It will be understood, that when the nuts 18 are operated to clamp the plates 16 and the spacing blocks 17 in position, the inner projecting ends of the clamping plates will lift the pan and clamp the inclined edge of the side flanges 9 thereof tightly against the insulated covering for the deck beam, so that an air and fluid tight joint is formed along the side edges of the pan. It will be understood that the bolts 13 are arranged at suitable distances along both sides of each pan and are suspended from the deck beams which form the side walls for the air ducts for which each pan forms the bottom. In order that the clamping plates 16 will properly engage the pan to form the airtight joint between the flanges 9 and the covering for the deck beams, the spacing blocks 17 are made of increasing thickness from the upper end of the pan toward the lower end thereof. By this means for securing the pans in place it will be noted that the construction of the pans is simplified over the form shown in our said applications, and that it is unnecessary to perforate the pans for the passage of fastening means.

We will now proceed to describe the means for securing the refrigerating coils, grids, pipes or loops in place in the air ducts formed by the ceiling of the magazine, the ceiling beams and pans 6, so that said coils, grids, pipes or conduits will be held rigidly in place and will not drop down upon the bottoms of the pans. In order to accomplish the result stated, we provide supporting members 19 extending transversely of the air ducts and the ends of which may be secured, as shown in Fig. 1, beneath the lower flanges of the deck beams on the bolts 13, and clamped in engagement with said flanges by means of the lower nuts 15 heretofore described. These transverse supporting members 19 bridge the space between the beams and are adapted to have the conduits or loops of the refrigerating system supported either on the upper side, or from the lower side, thereof. To the left of Fig. 1 we have shown two sets of refrigerating loops, one supported upon the upper sides of said transverse members, and the other from the lower sides thereof. In this arrangement the sets of loops are secured in place by a transverse clamping member 20 laid under the lower set of loops and a clamping member 21 over the upper set, said clamping members being secured by clamping bolts 22 let through said members 20, 21, and the transverse supporting members, and passing between the individual conduits of the loops. The clamping bolts 22 are provided at their lower ends with suitable nuts 23 by means of which the clamping members 20, 21 are drawn toward the conduits of the loops to securely and rigidly clamp the same against the transverse supporting members 19, so that said loops cannot rock from side to side or vibrate up and down during the rocking of the ship. This is important because any movement of the loops which would tend to cause the same to rattle against the pan or the surrounding structure, or to loosen the joints of the pipes of the loops, is prevented, thereby obviating leaks. At the right of Fig. 1 we have shown an arrangement in which but one set of loops is provided, the same being supported from the underside of the transverse member 19, being clamped thereto by the transverse member 20 and the clamping bolts 22 in the same manner that the lower set of loops is secured to the transverse supporting member at the left of Fig. 1.

In Fig. 4 we have shown the hanger bolts 13 as secured to the lateral flange of the deck beam at a point where the transverse supporting members 19 for the loops are not required, in which event the upper and lower clamping bolts 14, 15 directly engage the said flange of the deck beam. In other respects the construction is the same as that described with relation to Fig. 1.

In Fig. 5 is shown an arrangement for securing the transverse supporting members 19 for the refrigerating loops in place at a

point where it would not be necessary to have the hanger bolts for the pans. In this construction a simple headed bolt 24 is employed extending downwardly through the flange of the deck beam and the end of the transverse supporting member 19, the latter being clamped in place by a nut 25 on the lower end of the bolt 24, the said clamping bolt being embedded in or covered by the insulated covering.

What we claim and desire to secure by Letters Patent of the United States is:—

1. In an explosive magazine, in combination with the ceiling and the ceiling beams, of a transverse member connected to said beams and bridging the space between the same, refrigerating conduits supported above and below the said transverse member, clamping members overlying the conduits and clamping devices connecting said clamping members.

2. In an explosive magazine, in combination with the ceiling and the ceiling beams, of a refrigerant conduit in the space between the beams, a pan bridging the space between the beams and inclosing the conduit, hanger devices depending from the beams, and a plate on the end of each of the said devices and projecting beneath the pan to support the latter.

3. In an explosive magazine, in combination with the ceiling and the ceiling beams, of a transverse member connected to said beams and bridging the space between the same, refrigerating conduits supported above and below the said supporting member, clamping members overlying the conduits, and a clamping bolt connecting said clamping members.

4. In an explosive magazine, in combination with the ceiling and the ceiling beams, of a refrigerant conduit in the space between the beams, a pan bridging the space between the beams and inclosing the conduit, hanger devices depending from the beams, projections on the ends of said hangers projecting beneath the pan to support the latter, and blocks between the said projections and the beams, said blocks being successively of greater thickness from one end of the pan to the other to support the pan with its bottom on an incline.

5. In an explosive magazine, in combination with the ceiling and the ceiling beams, of a refrigerant conduit in the space between the beams, a pan bridging the space between the beams and inclosing the conduit, hanger bolts depending from the beams, and a plate on the end of each of the said bolts projecting beneath the pan to support the latter.

6. In an explosive magazine, in combination with the ceiling and the ceiling beams, of a refrigerant conduit in the space between the beams, a pan bridging the space between the beams and inclosing the conduit, hanger bolts depending from the beams, and plates on the ends of the said bolts projecting beneath the pan to support the latter, and blocks between said plates and the beams, said blocks being successively of greater thickness from one end of the pan to the other to support the pan with its bottom on an incline.

7. In an explosive magazine, in combination with the ceiling and the ceiling beams, of a refrigerant conduit in the space between the beams, a pan bridging the space between the beams and inclosing the conduit, hanger bolts depending from the beams, plates on the ends of the said bolts projecting beneath the pan to support the latter, and a space block on each bolt between the plate supported thereby and the beam.

8. In an explosive magazine, in combination with the ceiling and the ceiling beams, a pan bridging the space between the beams and inclosing the conduit, hanger bolts depending from the beams, plates on the ends of the said bolts projecting beneath the pan to support the latter, a transverse member bridging the space between the beams, clamping members above and below the transverse member and parallel thereto, and a plurality of conduit loops between each of said clamping members and the transverse member.

9. In an explosive magazine, in combination with the ceiling and the ceiling beams, a pan bridging the space between the beams, a transverse member extending across the pan, bolts connecting each end of said member to said beams and carrying means for supporting said pan, and a refrigerating conduit supported by said transverse member.

In testimony whereof we have hereunto signed our names in the presence of two subscribing witnesses.

JOHN EDWIN STARR.
CASSIUS CLAY PALMER.

Witnesses:
M. E. McNinch,
G. W. Ceylmur.