Sept. 27, 1949. W. E. SCHMIDT 2,482,878

REINFORCED REFRACTORY PIPE INSULATION

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FIG. 1.

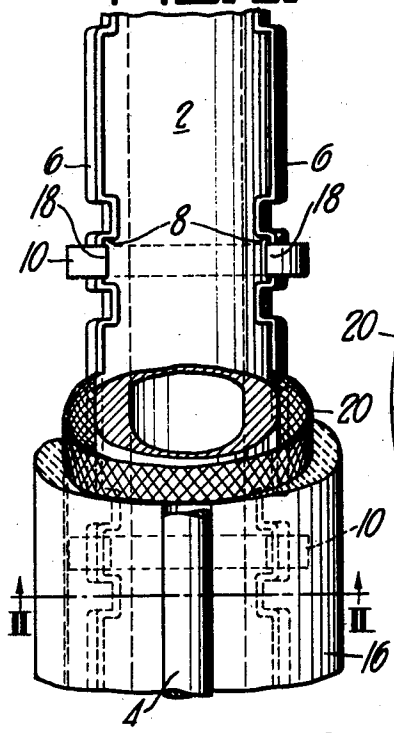

FIG. 2.

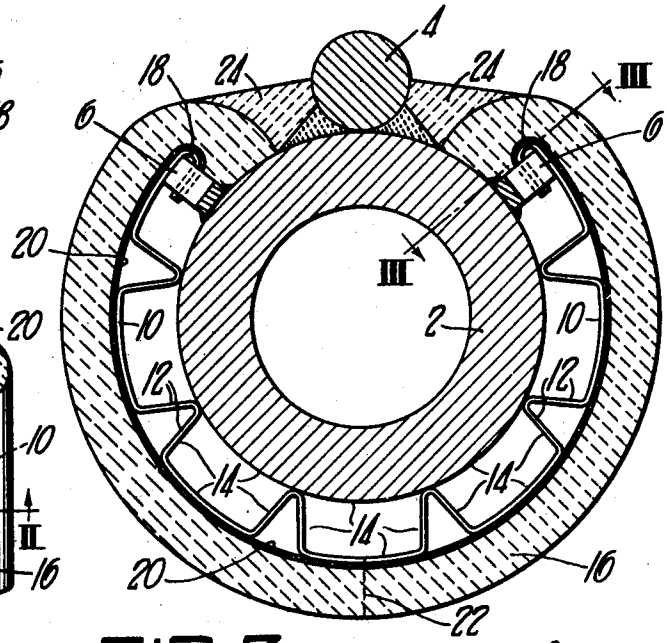

FIG. 3.

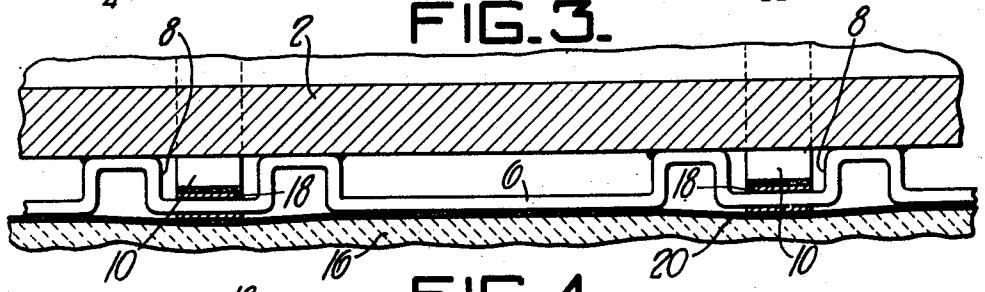

FIG. 4.

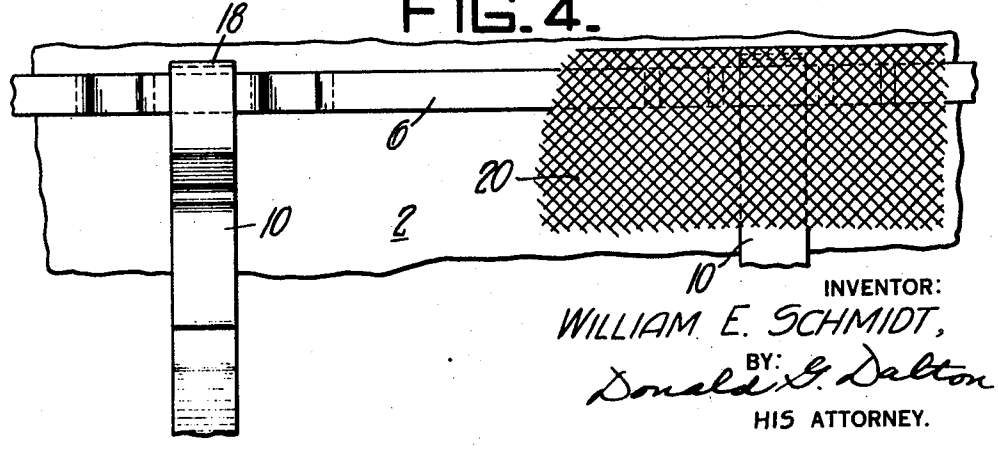

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FIG. 5.

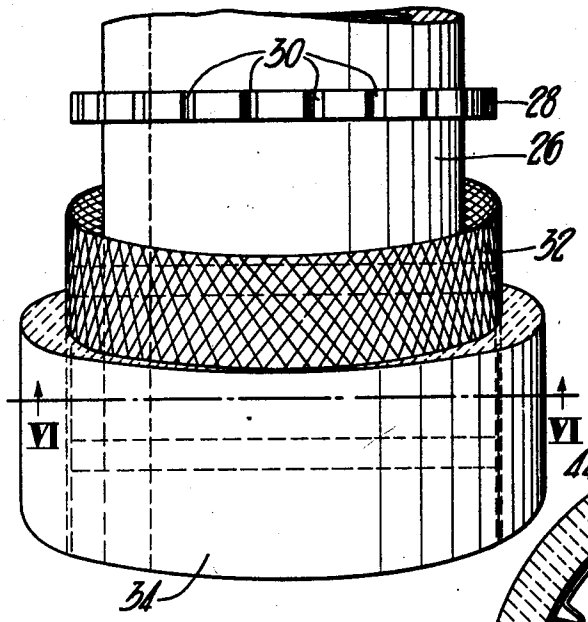


FIG. 7.

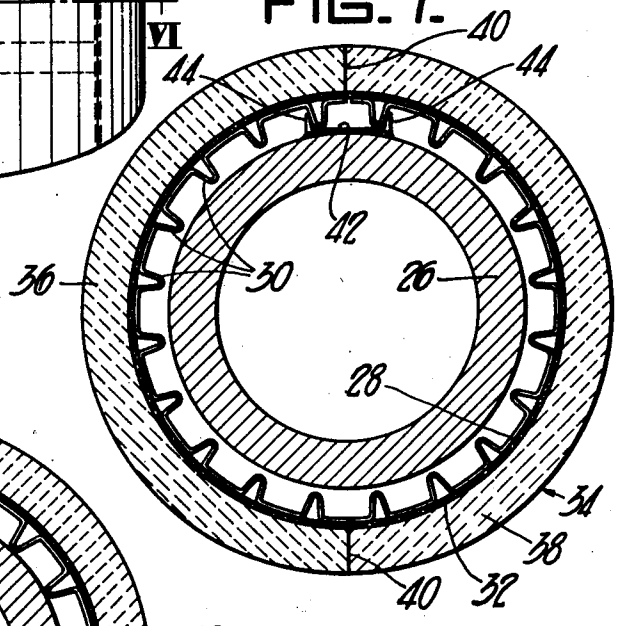
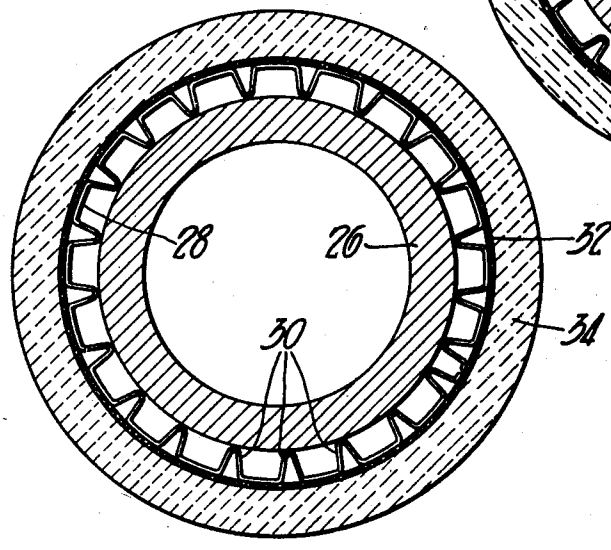


FIG. 6.



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Patented Sept. 27, 1949 2,482,878

UNITED STATES PATENT OFFICE

2,482,878

REINFORCED REFRACTORY PIPE INSULATION

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Application November 6, 1946, Serial No. 708,001

4 Claims. (Cl. 263—6)

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This invention relates to reinforced refractory insulation for pipe and is a continuation-in-part of my copending application, Serial No. 488,580, filed May 26, 1943, which issued as Patent No. 2,436,452 on February 24, 1948.

As set forth in my copending application, slab or billet reheating furnaces are provided with water cooled skids extending longitudinally of the furnace for supporting the work, the skids in turn being supported on water cooled pipes extending transversely of the furnace. When bare water cooled supports are used, heat is carried away from the furnace by the water in the pipes. While the insulating tile disclosed in my copending application overcomes this objection, it has been found that the insulating tiles are subject to a considerable amount of abuse and therefore tend to crumble after having been in service for some time, thus requiring replacement. It was also found difficult to maintain a uniform air space between the tile and the pipe.

It is therefore an object of my invention to provide insulation of sufficient strength to withstand the abuses to which it is exposed.

Another object is to provide insulation which can be easily repaired.

A still further object is to provide means for providing a constant dead air space between the refractory and the pipe.

These and other objects will be more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a top plan view of the insulation applied to a skid pipe;

Figure 2 is a sectional view taken on the line II—II of Figure 1;

Figure 3 is a view taken on the line III—III of Figure 2;

Figure 4 is a bottom plan view of Figure 3 with the refractory and part of the wire mesh cut away;

Figure 5 is a top plan view of the insulation applied to a horizontal skid pipe support;

Figure 6 is a sectional view taken on the line VI—VI of Figure 5; and

Figure 7 is a view similar to Figure 6 but showing the insulation in two parts.

Referring more particularly to the drawings, the reference numeral 2 indicates a skid pipe to which is welded a wearing strip 4 for supporting slabs or billets as they are pushed through the furnace. A supporting lug 6 is welded to the pipe on each side of the wearing strip 4. Each of the lugs 6 is made of a strip crimped to provide spaces 8 between the outer wall of the pipe 2 and the outer part of the lug. Spacer strips 10 are provided along the pipe 2 at spaced intervals. Each of the spacer strips 10 is provided with crimps 12, all of substantially the same height, to provide a dead air space 14 of uniform width between the refractory 16 and the pipe 2. The end of the spacer strips 10 are provided with hooks 18 which fit into the openings 8. Welded, or otherwise fastened to the spacer strip 10 is a reinforcing member 20 made of metal lath or wire mesh to which is bonded the refractory 16. In insulating skid pipes the spacer strip 10 and wire mesh 20 may be placed on the pipe and the plastic refractory 16 then applied. Due to the plasticity of the insulating material, it penetrates the openings in the wire mesh 20 forming a keyed bond between the two. If desired, the insulation may be precast, in which case it is made of two members which are split as shown in broken lines at 22 and after the insulation is placed on the pipe the two sections are cemented shut at 22 to provide airtightness therebetween. The space between the skid 4 and the reinforced refractory is then filled with refractory insulation 24. It will be understood that the refractory barrier or insulation may be made in sections or may be made continuous with expansion joints at necessary intervals.

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Figures 5 and 6 show a second embodiment of my invention, in which a horizontal pipe 26 is provided with insulation completely around its periphery. In this embodiment, spacer strips 28, having crimps 30 all of substantially the same height, extend completely around the pipe 26 at spaced intervals. The crimps 30 in this embodiment as well as in the other embodiments described may run parallel to the axis of the pipe, spirally or circumferentially. By making the crimps circumferentially, the dead air space is divided into chambers which prevent flow of the dead air. The spiral arrangement forms a long dead air chamber in which friction resists excessive flow of the air. Metal lath or wire mesh 32 is welded to the strip 28 and the plastic refractory 34 is molded in place after the strips 28 and wire mesh 32 are placed around the pipe 26.

Figure 7 is a view similar to Figure 6, but shows the arrangement of the refractory insulation when it is precast. In this embodiment the refractory 34 is made in two sections 36 and 38, each section being made up in the same manner as the section shown in Figure 6. In other words, the spacer strip 28 is welded to the wire mesh 32 and the refractory 34 is cast thereon. Top and bottom seams 40 are serrated and cemented shut

for airtightness after being installed on the pipe 26. A structural channel section 42 is welded to the top of the pipe 26 and its flanges 44 provide lugs for supporting the sections 36 and 38 by means of crimps 30.

The use of the unit construction described above insures a better seal of the dead air space. The construction described also facilitates the forming of insulation around parts which would otherwise require special and complicated fitted segments.

While three embodiments of my invention have been shown and described, it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. Reinforced refractory insulation for a substantially horizontal pipe comprising a pair of lugs on the upper half of said pipe, a two part refractory barrier suspended from said lugs, each part of said barrier comprising a reinforcing member surrounding approximately one-half of said pipe and spaced from the other wall thereof, a refractory covering bonded to said reinforcing member, and a spacer strip having crimps all of substantially the same height between the outer wall of the pipe and the reinforcing member whereby a dead air space is provided therebetween.

2. Work-supporting structure comprising a work-supporting member having a work-engaging portion and insulation disposed generally about the work-supporting member to protect the same but with the work-engaging portion exposed to engage work supported by said structure, a lug on each side of said work-engaging portion extending longitudinally of said structure, said insulation comprising a reinforcing member surrounding said pipe and spaced from the outer wall thereof, a refractory covering bonded to said reinforcing member, a spacer strip having crimps all of substantially the same height between the outer wall of the pipe and the reinforcing member whereby a uniform dead air space is provided therebetween, and means for supporting said insulation on said lugs.

3. Work-supporting structure comprising a work-supporting member having a work-engaging portion and insulation disposed generally about the work-supporting member to protect the same but with the work-engaging portion exposed to engage work supported by said structure, a lug on each side of said work-engaging portion extending longitudinally of said structure, said insulation comprising a reinforcing member surrounding said pipe and spaced from the outer wall thereof, a refractory covering bonded to said reinforcing member, a spacer strip having crimps all of substantially the same height located between the outer wall of the pipe and the reinforcing member whereby a uniform dead air space is provided therebetween, and a flange on the ends of said spacer strip extending over said lugs to support said insulation.

4. Work-supporting structure comprising a work-supporting member having a work-engaging portion and insulation disposed generally about the work-supporting member to protect the same but with the work-engaging portion exposed to engage work supported by said structure, a lug on each side of said work-engaging portion extending longitudinally of said structure, said insulation including a two part refractory barrier suspended from said lugs, each part of said barrier comprising a reinforcing member surrounding approximately one-half of said pipe and spaced from the outer wall thereof, a refractory covering bonded to said reinforcing member, a spacer strip having crimps all of substantially the same height located between the outer wall of the pipe and the reinforcing member whereby a uniform dead air space is provided therebetween, said spacer strip having portions thereof between the crimps to which the reinforcing member is welded, and a flange on the ends of said spacer strip extending over said lugs to support said insulation.

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