Aug. 2, 1932. L. I. BECKWITH 1,870,087

SUPPORTING STRUCTURE

Filed July 23, 1929

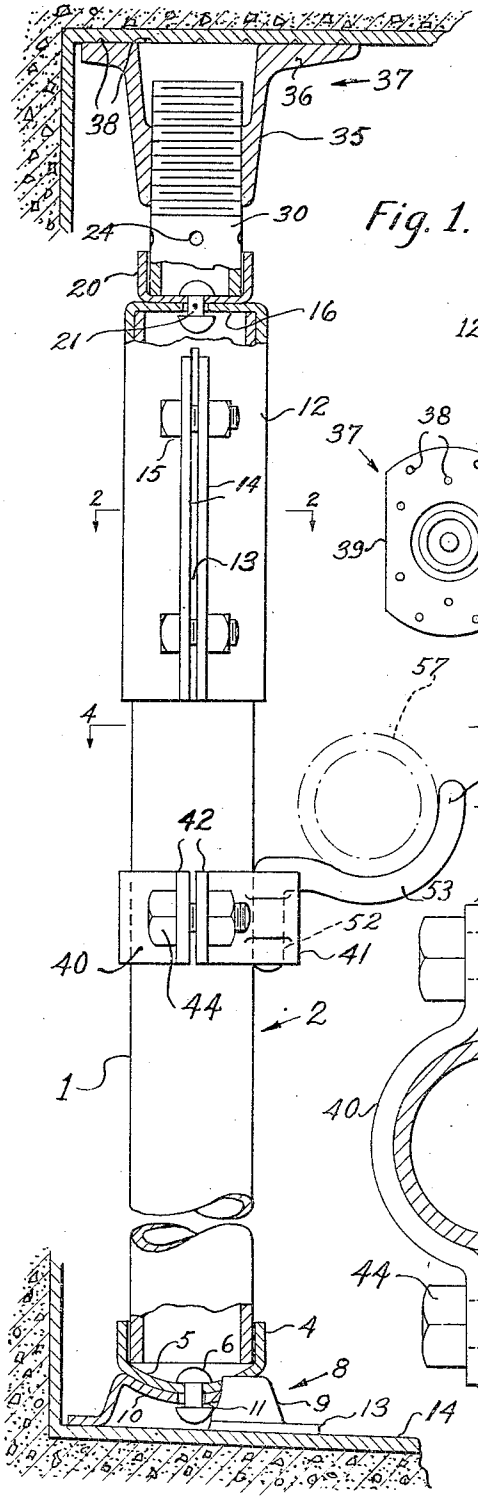


Fig. 1.

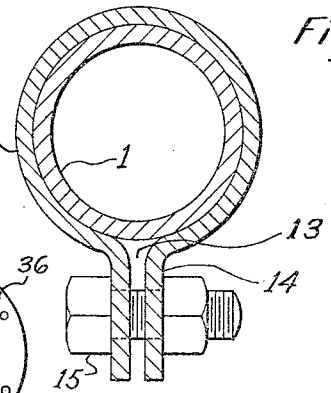


Fig. 2.

Fig. 5.

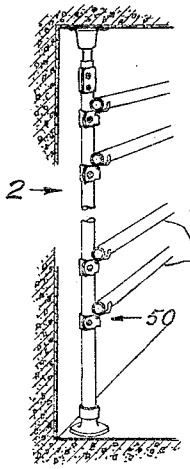


Fig. 3.

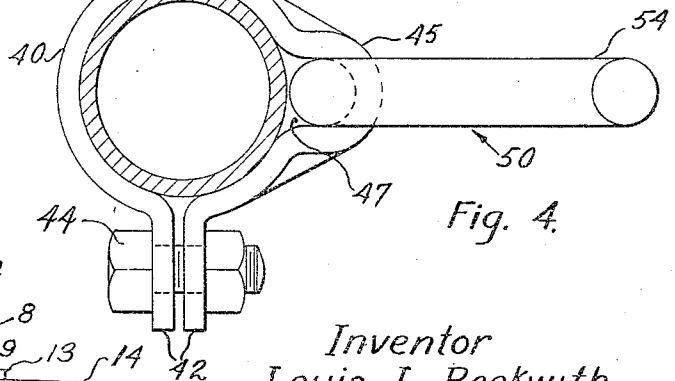


Fig. 4.

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UNITED STATES PATENT OFFICE

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SUPPORTING STRUCTURE

Application filed July 23, 1929. Serial No. 380,340.

This invention relates to improved supporting structure which is particularly suitable for refrigerating installations or the like, although certain features thereof may be advantageously employed for other uses.

The present invention provides means for supporting pipe coils and the like in a refrigerating room where it is not desirable to drill or puncture the walls of the room that ordinarily are formed of heat insulating material. To this end expansible struts are provided which may be readily adjusted to engage the floor and ceiling of the room or the like, without necessity for drilling holes, welding, etc. These expansible struts or uprights are preferably provided with means permitting their ready installation despite slight angular irregularities or variations in the planar arrangement of the surfaces with which they are engaged. Furthermore, the uprights may be arranged to have elongate intermediate portions of uniform diameter which are adapted readily to receive the supporting brackets for coils or the like. These brackets in the preferred form of the invention are arranged readily to be clamped to the uprights at any desired heights or intervals, thus the ready removal or rearrangement of the same may be effected. These brackets are simple in construction, cooperating with the surface of the upright in forming means to hold the pipes in place. Furthermore, with this arrangement the pipes are offset in relation to the uprights so that moisture from the pipes ordinarily will drop directly to the floor rather than flowing down the uprights.

In the accompanying drawing:

Fig. 1 is a broken view partly in section of the preferred form of upright with a single pipe support shown in conjunction therewith;

Fig. 2 is a section on line 2—2 of Fig. 1;

Fig. 3 is a perspective view of an installation showing the manner in which such an upright is employed to support a plurality of pipes;

Fig. 4 is a section on line 4—4 of Fig. 1; and

Fig. 5 is a top view of the upright.

In the accompanying drawing, which by way of exemplification illustrates one concrete embodiment of the invention, the numeral 1 designates an elongate intermediate member which preferably may be tubular, forming the body of the expansible strut 2. The lower end of this member 1 is received in a cuplike part 4 having a curved bottom portion 5. The latter is connected by a fastening 6, such as a rivet, to a base member 8; the latter is provided with an intermediate portion 9 having a concavely curved part 10 complementary to the part 5 of member 4. The fastening 6 preferably extends loosely through an opening 11 in the part 10 of base 8. Member 8 is provided with a flat peripheral flange 13 that is adapted to rest upon a floor 14 or the like. It is thus evident that some relative movement is permitted between the upright 1 and the base member 8. Accordingly the upright does not have to be located exactly at right angles to the portion of the floor engaged by the base member. Thus, slight irregularities in the floor do not hinder the ready installation of an upright of this character or cast an undue strain upon the same.

The upper portion of the member 1 may conveniently be engaged within a tubular member 12 having a closed upper end 16 but having a vertical slot 13 for the major portion of its height. Flanges 14 project outwardly from this slot and are provided with openings to receive screw threaded fastening elements 15, whereby the lower portion of the member 12 may be drawn firmly into engagement with the upper end of the upright. A cup member 20 is preferably secured to the member 12 by a fastening 21, such as a rivet, which preferably loosely connects members 12 and 20 to permit a slight angular variation in the relative positions thereof.

A rotatable member 30, which preferably may be tubular, and be formed of metal, such as brass, is loosely received in the cup 20, having its lower end resting upon the bottom of this cup as shown in Fig. 1. A plurality of openings 24 may be disposed in the rotatable member 30 to permit its ready movement by a tool, such as a spanner wrench. The upper end of member 30 is preferably threaded and received in an internally threaded boss 35 depending from the bearing portion 36 of an upper bearing member 37. The bearing portion 36 preferably provides a surface which may carry prongs 38 for engagement in the ceiling, thus preventing rotation of member 36. Preferably one side of the bearing portion 37 of member 36 is cut away as designated by numeral 39 (Fig. 5) to enable the upright to be disposed close to a side wall, if desired.

Since the main portion of the upright 2 is formed by the elongate member 1 of substantially uniform diameter, the coil supporting brackets or the like may be disposed at any desired heights or intervals. One of these brackets is illustrated in detail in Figs. 1 and 4, and comprises the substantially semicircular elements 40 and 41, having outstanding ears 42 with openings 43 to receive bolts 44 whereby the elements may be normally clamped at any desired position upon the uprights. Preferably the element 41 has an offset portion 45 which cooperates with the adjoining surface of the upright member 1 in forming a recess or socket 47. A coil supporting member 50 preferably has a depending portion 52 that is adapted to have an interfitting engagement with this socket, and has an outwardly extending portion 53 with an upwardly curved outer end 54, and is adapted to hold a pipe 57 spaced from the adjoining upright 1.

It is evident that supporting means of the character shown are particularly suited to support refrigerating coils in a cold room or refrigerating vault, the walls and floor and ceiling of which are ordinarily formed of insulating material. Supporting means of this character avoid the necessity of drilling the walls of the chamber, and accordingly it is possible to install the refrigerating coils in any desired manner after the chamber is built, rather than making the supports for the same a built-in part of the room or chamber.

It is evident that the loose connections at the ends of the upright 1 permit minor variations in angularity, so that the portions of the floor and/or ceiling which are engaged by the bearing members 8 and 37 respectively, do not need to be exactly horizontal in order to insure the vertical positioning of the upright itself. The upright is located in position by placing the bearing flange 13 at the desired location upon the floor, and by merely rotating the member 30 by means of a suitable tool engaging the openings 24 until the bearing surface 36 and prongs 38 of the upper member 37 are brought into firm engagement with the ceiling. The upright is thus expanded into firm engagement with the floor and ceiling without necessity for drilling holes, applying a plurality of fastening means, or requiring extreme accuracy in workmanship. Furthermore, due to the loose connection of its component parts, such a strut is relieved from excessive stresses which otherwise might be impressed thereon. The elongate body portion 1 of the upright provides a support to receive the coil supporting brackets at any desired intervals or heights, thereby affording the utmost flexibility in supporting equipment of the class described. This structure is simple and involves the employment of the minimum number of parts. Furthermore, the pipes are disposed at one side of the uprights in such a manner that the major portion of the moisture which drips therefrom will fall directly to the floor rather than flowing down over the upright.

While structure of this character is particularly desirable for, and suited to, employment as supports for refrigerating coils or the like, they may also be employed for other purposes, and such uses are to be contemplated as being covered by the following claims.

I claim:

1. An upright of the class described comprising an elongate intermediate portion, a rotatable member rotatably connected to one end of the intermediate portion, said member being screw threaded, an end member having a screw-threaded portion in engagement with the aforesaid rotatable member, means providing for relative rotary movement of said rotatable member and the intermediate portion while maintaining these parts in substantially the same positions longitudinally of each other, said end member having a substantially flat transversely extending bearing surface provided with prongs to effect its non-rotatable engagement with a horizontal surface.

2. An upright of the class described comprising an elongate intermediate portion, a rotatable screw-threaded member carried by one end of said portion, means for providing for rotation of this member while maintaining the latter and the intermediate portion in substantially the same positions longitudinally of each other, an end member having a boss internally threaded and in engagement with said screw-threaded rotatable member, said end member having a flat transversely extending bearing surface for engagement with a ceiling or the like.

3. An upright of the class described comprising an elongate, intermediate member, an upper bearing member, expansible means between said members, a lower socket portion

receiving the lower end of the elongate member, a base member, said socket portion having a loose freely rotatable connection to the base portion whereby slight variations in the angular position of the elongate member in any direction about the axis thereof may readily be effected.

4. An upright of the class described comprising an expansible intermediate portion, an upper bearing member and a lower cupped member having a bearing flange for engagement with an imperforate floor, said intermediate portion having a curved surface in engagement with a complementarily formed surface of the base member and having a loose freely rotatable connection with the latter, whereby some relative movement between the intermediate portion and the base member is permitted in substantially any direction about the axis of the intermediate portion.

5. An upright of the class described comprising an elongate tubular member, a part clamped to the upper end of the member, a cup loosely connected to said part, a rotatable member mounted in the cup and having a screw-threaded upper end, an upper bearing member having a depending internally threaded boss in engagement with the screw-threaded portion of the rotatable member, the upper bearing member having a surface substantially at right angles to the extent of the elongate member, and a lower bearing member rotatably connected to the lower end of said elongate member.

6. An upright of the class described comprising an elongate tubular member, a part clamped about the upper end of the tubular member, a cup loosely connected to said part, a rotatable member mounted in the cup and having a screw-threaded upper end, an upper bearing member having a depending internally threaded boss in engagement with the screw-threaded upper end of the rotatable member, the upper bearing member having a surface substantially at right angles to the extent of the elongate member, and a lower bearing member rotatably connected to the lower end of said elongate member, said lower bearing member comprising a cupped portion having a curved surface in engagement with a curved surface at the end of the elongate member and loosely connected thereto.

7. An upright of the class described comprising a lower bearing portion having a concave part, an elongate member, a part having a convex surface at the lower end of the elongate member in engagement with said concave part of the lower bearing member, a connecting element securing said parts in loose relatively rotatable engagement with each other whereby some relative movement between the convex and concave surfaces is permitted, a cup member loosely connected to the upper end of the elongate member, a rotatable threaded element supported by the cup member, an upper bearing member having a depending threaded portion in engagement with said rotatable member and having a flat bearing surface for engagement with a ceiling, and means for supporting a coil from the elongate member.

Signed by me at Everett, Mass., this 11th day of July, 1929.

LOUIS I. BECKWITH.