Aug. 2, 1932. L. I. BECKWITH 1,870,088

REFRIGERATING APPARATUS

Filed June 12, 1931 3 Sheets-Sheet 1

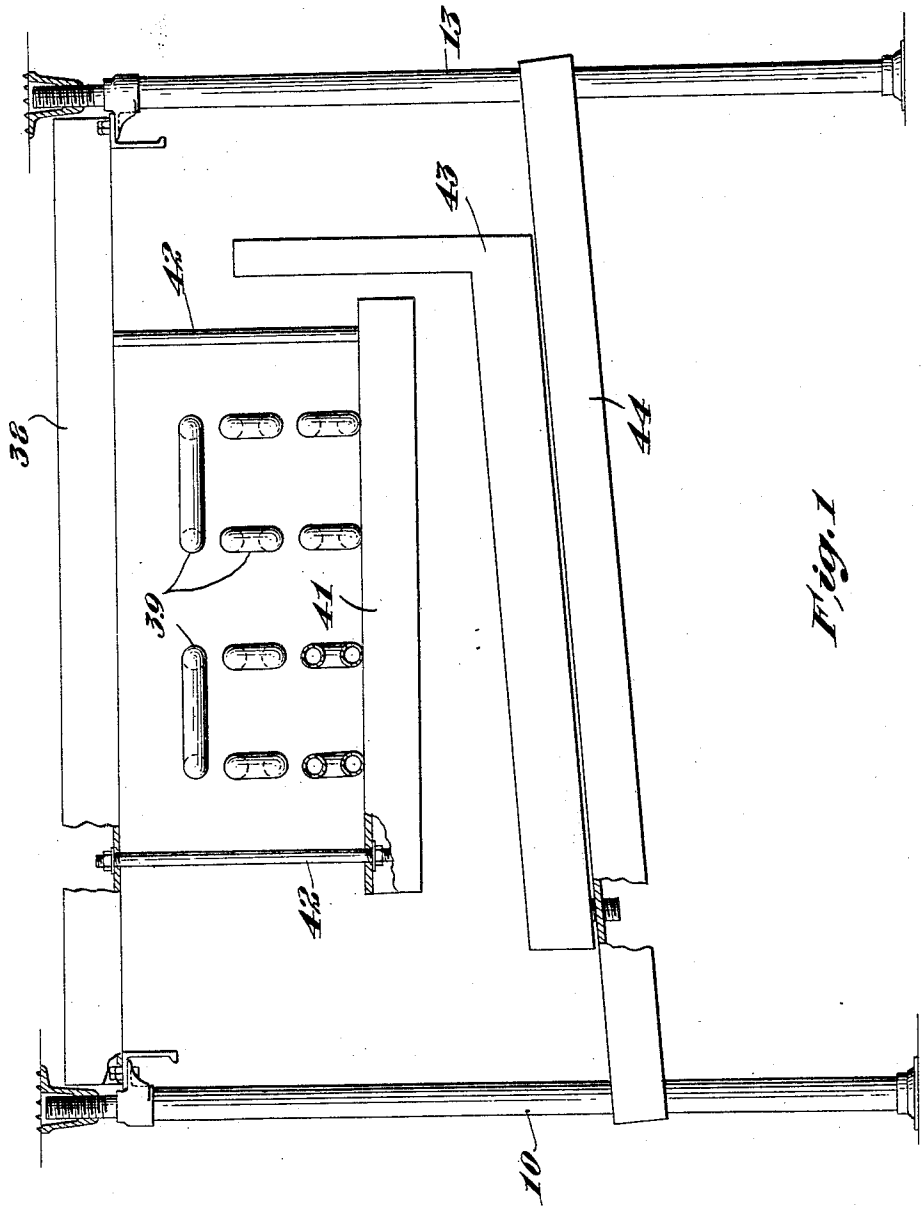



Fig. 1

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REFRIGERATING APPARATUS

Filed June 12, 1931 3 Sheets-Sheet 2

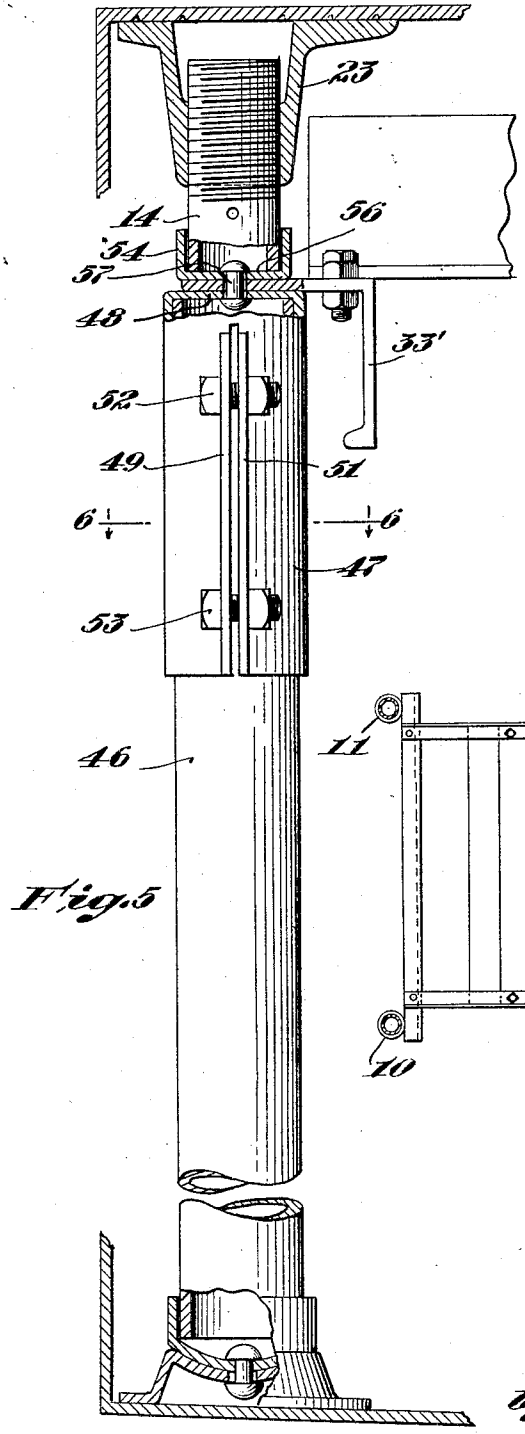



Fig. 5

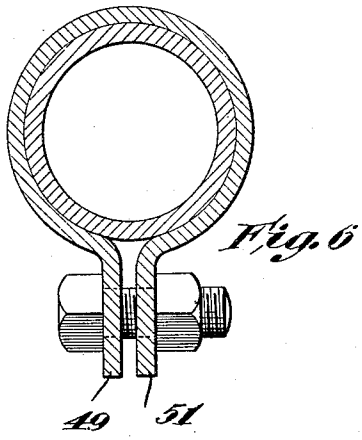



Fig. 6

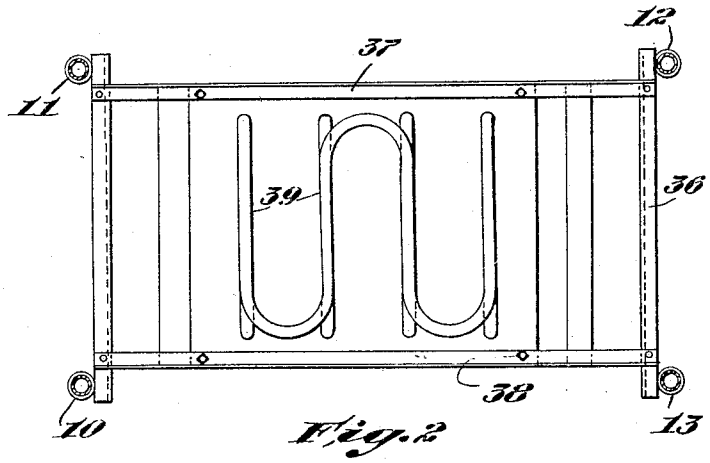



Fig. 2

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REFRIGERATING APPARATUS

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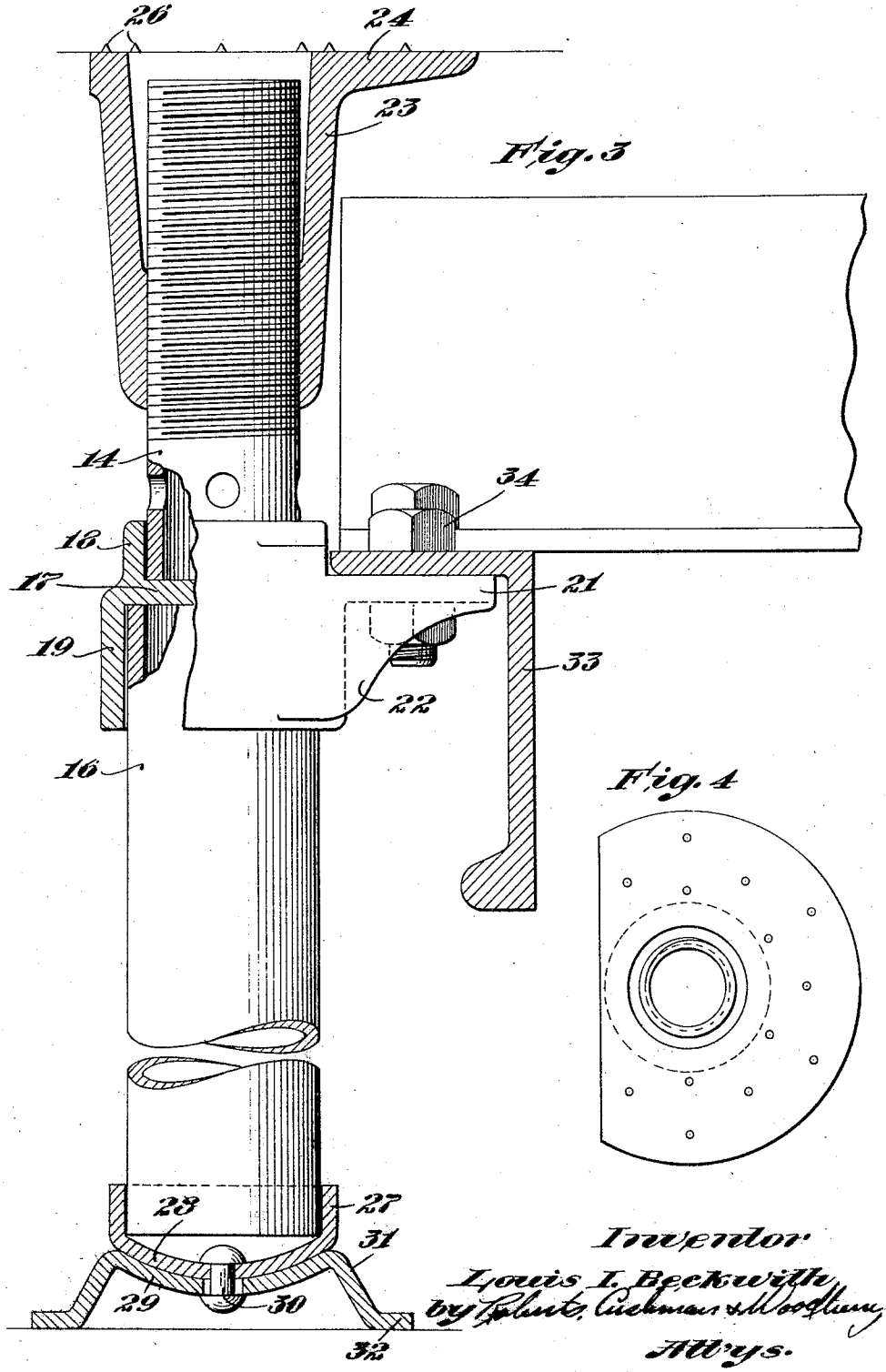



Fig. 3

Fig. 4



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# UNITED STATES PATENT OFFICE

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## REFRIGERATING APPARATUS

Application filed June 12, 1931. Serial No. 544,023.

This invention relates to apparatus for installation in refrigerating rooms or compartments for supporting cooling coils or like portions of refrigerating equipment, part of the subject matter hereof having been divided out of my copending application, Serial No. 388,763, filed August 27, 1929. In refrigerating installations of this general character, it is highly desirable that in so far as possible the insulating walls of the room or compartment be left imperforate to avoid heat losses, particularly by conduction through braces or supports embedded in or extending through the insulation. While the necessary framework for the refrigerating apparatus may be carried by expansible supports which merely abut against the walls or are otherwise secured without piercing or passing therethrough, such supports generally require relatively rotatable parts which are not readily adaptable for attachment to fixed portions of a supporting framework.

Objects of this invention are generally to improve the construction of installations of this kind to facilitate assembly and adjustment of frame or supporting portions thereof; to provide apparatus for these purposes of strong, durable construction consisting of few relatively simple parts which are inexpensive to manufacture and assemble; and also to provide apparatus of the class described having an improved construction and relative arrangement of parts.

In the drawings:

Fig. 1 is a side elevation of a refrigerating installation;

Fig. 2 is a plan view to a reduced scale of the apparatus shown in Fig. 1, with parts omitted and broken away for the purpose of illustration;

Fig. 3 is a side elevation of one of the uprights shown in Figs. 1 and 2 with parts broken away and in section;

Fig. 4 is a top plan view of the upright shown in Fig. 3;

Fig. 5 is a view similar to Fig. 3, illustrating a modification; and

Fig. 6 is a section along the line 6—6 of Fig. 5.

In the apparatus selected for illustration, the installation comprises expansible uprights 10 and 11 (Fig. 2) arranged in one row, and uprights 12 and 13 similarly spaced in another row. As shown more clearly in Figs. 1 and 3, each of these uprights comprises upper and lower tubular sections 14 and 16, which are relatively rotatable and are supported in substantial alignment by means comprising a transverse wall or web 17 which extends between the opposed or adjacent ends of these sections, and resting upon the upper end of the lower section and providing a seat for the lower end of the upper section. As shown in Fig. 3, this transverse web forms an integral part of a bracket member comprising the upper circumferential or annular wall 18 which is complementary to and spaced to receive and fit about the lower end of the upper section 14. The upper wall 18, as well as the transverse wall 17 are also integral with a depending annular wall or flange 19 which is complementary to and fits about the upper end of the lower section 16. This unitary structure carries an exterior arm 21 formed substantially as a continuation of the transverse wall 17, this arm being reinforced on its lower side by a suitable web construction 22.

The upper end of the upper section 14 has threaded engagement with a foot 23 having a substantially flat upper surface 24 which is provided with a relatively short projection 26. The lower tubular section 16 has its lower end disposed in a cup member 27 formed with a convex transverse wall 28 complementary to a concave seat 29, the latter forming part of a floor pad or bracket 31 having a substantially flat portion such as a peripheral flange 32 which is adapted to abut against the floor or bottom wall of a refrigerating compartment. The cup member 27 carries a rivet 30 which fits loosely through a slot in the floor pad to provide a connection which permits angular adjustment between these parts.

With this form of the apparatus, a structural member such as the angle 33 is disposed longitudinally along the row in which the uprights 10 and 11 are disposed with one leg of the angle overlying and resting upon the

arms or brackets 21 carried by the uprights of this row, being secured thereto in any approved manner, as by attaching bolts 34. In a similar manner, a structural member or angle 36 (Fig. 2) is arranged to extend along the row in which the uprights 12 and 13 are disposed and to rest upon brackets 21 carried by these uprights. Between these angles 33 and 36, beams 37 and 38 are arranged to extend transversely at longitudinally spaced points along the rows of uprights, each beam resting upon and being secured to the angles carried by the uprights. A refrigerating coil 39 is supported upon a frame 41 suspended by hangars 42 from the beams 37 and 38. Below the frame 41, a combined bunker pan and baffle structure 43 is disposed upon members 44 which extend transversely between the uprights 10 and 13, and 11 and 12, respectively.

In the modification shown in Figs. 5 and 6, each upright comprises a lower or intermediate tubular section 46, which has its lower end mounted in a similar manner to that illustrated in Fig. 3, while the upper end of this tubular section is telescoped within a clamping sleeve 47 having a transverse wall 48 extending across and closing the upper end of this sleeve, while the latter is also slitted or slotted longitudinally and provided with mating flanges 49 and 51 on opposite sides of the slot. These flanges being adapted to be clamped together by bolts 52, 53 spaced therealong.

The upper tubular section 14 is similar in all respects to the corresponding section illustrated in Fig. 3, and in fact these parts may be identical, the upper section of Fig. 5 having threaded engagement with the foot 23 similar to the foot illustrated in Fig. 3, and adapted to engage the top wall or ceiling of a compartment by abutting against the latter. The lower end of the upper section 14 of Fig. 5, however, is received within a cup member comprising the annular retaining flange or wall 54 and the transverse wall 56. With this form of construction, structural members such as angles 33′ are arranged to extend along the uprights of each row, and are provided with a web or leg which is interposed between the transverse walls 48 and 56 of the sleeve, and of the cup respectively. This interposed web or leg and the adjacent transverse walls 48 and 56 have registering apertures in which a retaining or connection means in the form of a headed rivet 57 is loosely fitted so that the heads thereof overlie the marginal portions of the apertures in the walls 48 and 56, thus providing a connection between the cup member and sleeve which permits relative rotational movement.

It will be seen that with this form of construction angle 33′ is supported by the upright close to the center of the flange where support for angles 37 and 38 is most necessary. This arrangement of angle 33′ also facilitates centering of the tubular member 46. The problem of assembling and installing these parts is simplified by the arrangement of the clamping sleeve 47. It will be evident that this sleeve may be mounted loosely on the member 46 with angle 33′ and cup member 54 connected thereto. The post 46, angle 33′ and cup member 54 may then be raised as a unit without danger of the angle slipping off the post. Thus two men may easily lift the uprights or posts 10 and 11 (Fig. 2) and the associated angle 33′ to set these uprights and yet leave adequate space for inserting the expansible upper section comprising the member 14 and foot 23. Moreover there is frequently a variation in the height of a room wherein this apparatus is to be installed, as where the floor is made to pitch to a center drain. In such cases the clamping sleeve may readily be adjusted longitudinally of the upright to bring the angle 33′ or other portions of this framework to the desired elevation.

When uprights of the type disclosed in Fig. 3 are employed in an installation of this kind, it will be observed that the unitary bracket provides a connection between the upper and lower relatively rotatable sections 14 and 16 which maintains these sections in vertical alignment and at the same time transmits stresses therebetween without substantially interfering with relative movement of these sections. This bracket member also provides a convenient means for supporting the longitudinally disposed structural members or channels 33.

In the modification shown in Figs. 5 and 6 a similar result is accomplished by mounting the longitudinally disposed structural members or angles 33′ directly between the upper and lower relatively rotatable members and loosely connecting these parts together by means of the sleeve 47 and the cup member 54, so as to provide for transmitting stresses therebetween without interfering with the relative rotational movement. In both forms of construction the beams 37 and 38 rest upon and are secured directly to the longitudinally disposed angles. In this way a portion of the refrigerating equipment, such as the coil 39, may be supported from expansible uprights without interfering with relative rotation of the parts comprising each upright, so as to assure that each of these expansible members will be free to function in its intended manner.

Thus the invention provides for supporting a refrigerating coil between an imperforate floor and an imperforate ceiling of a refrigerator compartment by supporting the coil from uprights in the manner described, and providing such uprights with upper and lower feet adapted to abut against the floor and ceiling respectively without extending

through or piercing the insulation normally disposed across these surfaces. While these improved features of construction have been disclosed specifically only with respect to the framework for supporting the refrigerating coil, it will of course be evident that a like construction may be provided for the lower transverse members 44 which support the bunker pan should this be desired. However, it is found that many cases where a framework is connected to a rotary part of an expansible upright at only one point along the length thereof, such a construction may not materially interfere with rotation of this part, whereas when a framework is connected at points spaced longitudinally along an expansible upright there is a considerable tendency to produce bending and torsional strain which causes the parts to bind, often making it very difficult to effect proper adjustment of these expansible supports without disconnecting the framework supported thereby, such for example as the transverse members 38 or 44.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. An installation of the class described comprising expansible uprights spaced in rows, each upright extending substantially between the floor and ceiling and comprising upper and lower relatively rotatable sections, means associated with each section and relatively rotatable in relation thereto for abutment against the floor and ceiling respectively, a web disposed transversely between the adjoining ends of the sections of each upright, interfitting connections between adjoining ends of said sections and the webs, said connections providing for relative rotary movement of the sections of each upright while retaining them substantially in alignment, structural means extending longitudinally of each row and connecting the webs associated with the uprights thereof, beams extending transversely between the rows and supported by the structural means, and means for supporting a cooling coil from the beams.

2. An installation of the class described comprising expansible uprights spaced in rows, each upright extending substantially between the floor and ceiling and comprising upper and lower relatively rotatable sections, means for connecting each section to the floor and ceiling respectively, a web disposed transversely between the adjoining ends of the sections of the upright, interfitting connections between the adjoining ends of said sections and the webs, said connections providing for relative rotary movement of the sections of each upright while retaining them substantially in alignment, structural means extending longitudinally of each row and connecting the webs associated with the uprights thereof, other structural means extending transversely between the rows and supported from the first mentioned structural means, and means for supporting a cooling coil from said other structural means.

3. An installation of the class described comprising expansible uprights spaced in rows, each upright extending substantially between the floor and ceiling and comprising upper and lower relatively rotatable sections, means associated with each section and relatively rotatable therewith for abutment against the floor and ceiling respectively, structural members extending substantially horizontally adjacent the uprights of each row, each structural member having a web disposed transversely between the opposed ends of the upper and lower sections of the uprights adjacent thereto, this web being supported by the lower sections and providing a seat for the upper sections, means extending through the web for connecting the upper and lower sections of each upright for relative rotary movement and for retaining these sections substantially in alignment, beams extending between and supported by the structural members and means for suspending a cooling coil from these beams.

4. In an installation of the class described, the combination of an expansible upright extending between the floor and ceiling and comprising upper and lower relatively rotatable sections, means associated with each section and relatively rotatable therewith for abutment against the floor and ceiling respectively, bracket means associated with the upright and comprising a horizontally extending structural member having a transverse web disposed between the adjacent ends of the upper and lower sections, this web being supported by the lower section and providing a seat for the upper section, means extending through the web for connecting the upper and lower sections for relative rotary movement and for retaining these sections substantially in alignment, and means for supporting a cooling coil from the structural member.

5. In an installation of the class described, the combination of an expansible upright comprising upper and lower relatively rotatable sections, bracket means associated therewith and comprising a transverse web disposed between these sections, this web being supported by the lower section to provide a seat for the upper section, retaining means embracing the respective sections, means connecting the retaining means together and to the web for holding the sections substantially in alignment, and means cooperating with the web for supporting a cooling coil.

6. In an installation of the class described, the combination of an expansible upright

comprising upper and lower relatively rotatable sections, bracket means associated therewith and comprising a transverse web disposed between these sections, caps on the adjacent ends of the sections and disposed substantially in abutment with the transverse web, a connection extending through the web and between the caps for connecting the latter for relative rotary movement and for retaining the upper and lower sections substantially in alignment, and means cooperating with the web for supporting a cooling coil.

7. In an installation of the class described, the combination of an expansible upright comprising upper and lower relatively rotatable sections, bracket means associated therewith and comprising a transverse web disposed between these sections, caps on the adjacent ends of the sections and disposed substantially in abutment with the transverse web, the caps and the web having substantially aligned openings therein, a headed rivet extending loosely through these openings with its head disposed within the respective caps and overlying the openings therein to connect these parts for relative rotary movement and to retain the upper and lower sections substantially in alignment, and means for supporting a cooling coil from the web.

Signed by me at Boston, Massachusetts, this 6th day of May, 1931.

LOUIS I. BECKWITH.