

March 19, 1940.

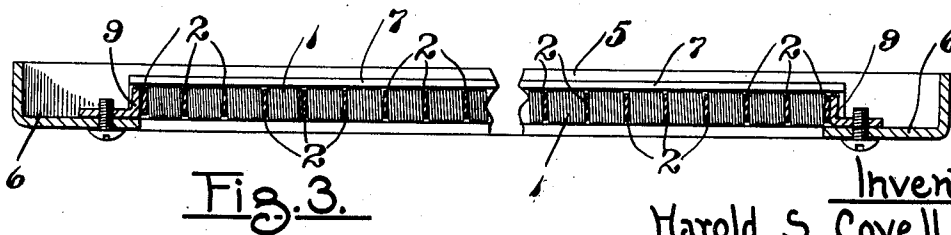
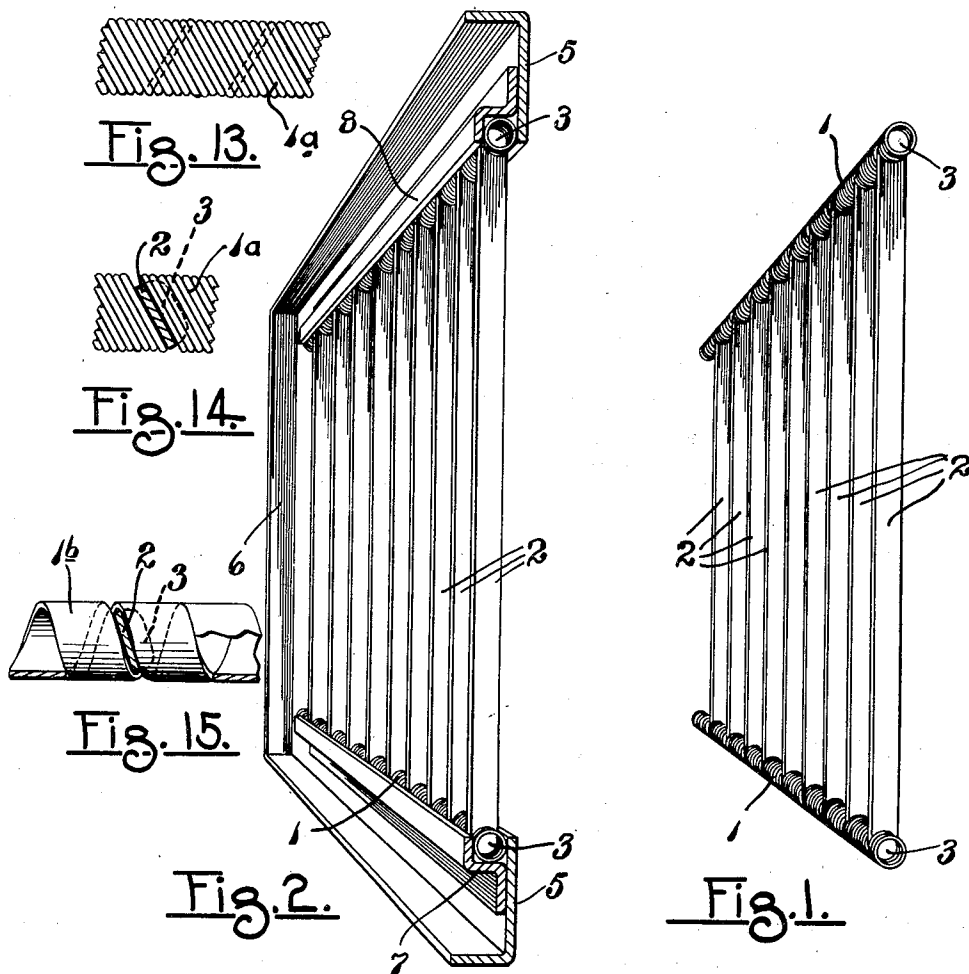
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2,194,113

GRILLE CONSTRUCTION

Filed Aug. 15, 1938

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

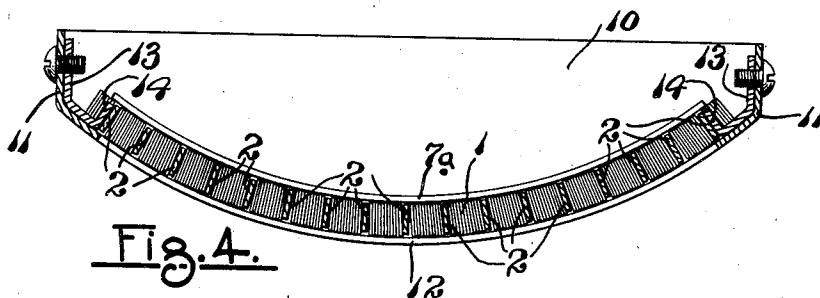


Fig. 4.

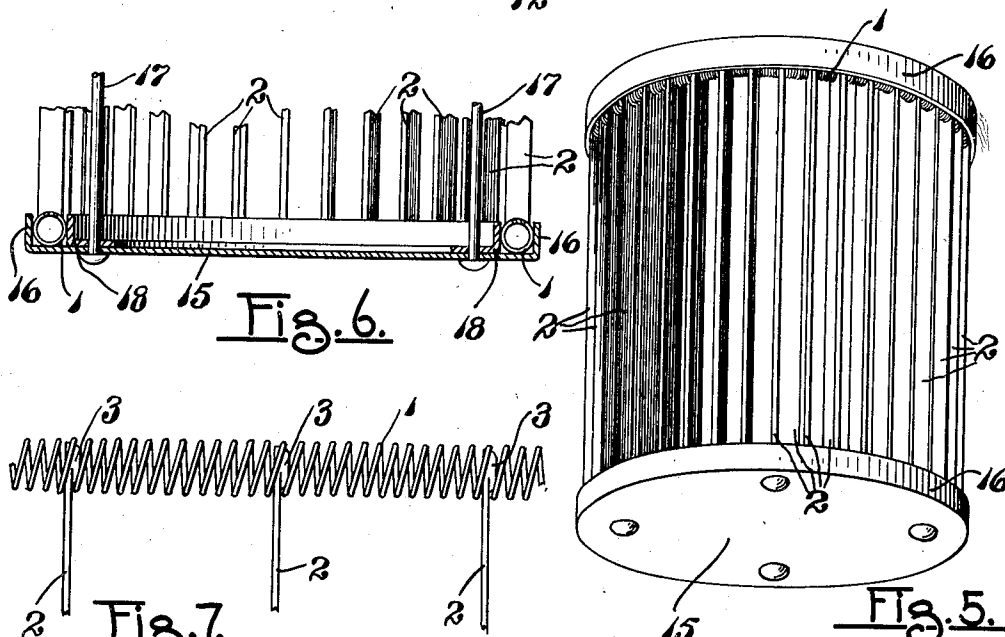


Fig. 5.

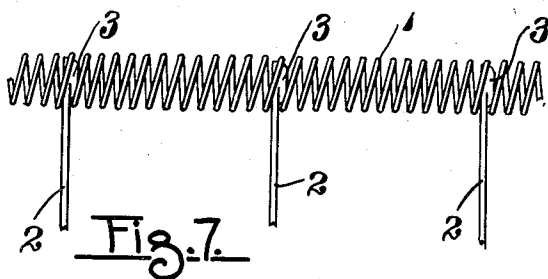


Fig. 6.

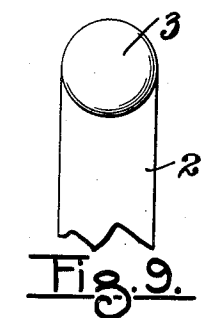


Fig. 7.

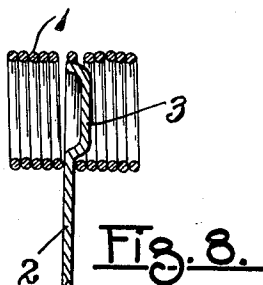


Fig. 8.

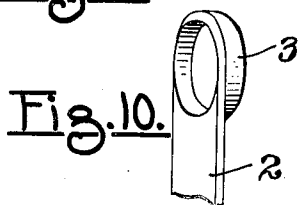


Fig. 9.

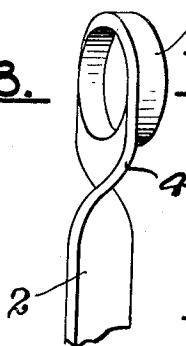


Fig. 10.

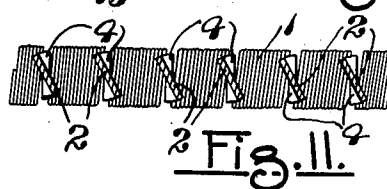


Fig. 11.

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GRILLE CONSTRUCTION

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10 Claims. (Cl. 189—84)

This invention relates to a grille construction of the type and character which is used for the passage of air in connection with heating and ventilating systems. Such grilles may be located at an opening in a wall of a room, in the side of a railway car, or may, with our construction, be disposed on the floor of a room, extending upwardly therefrom, and has spaced apart bars through which air, either heated or cooled, is passed.

Our invention is directed to a particularly simple, effective, economically manufactured and novel construction of grille and grille bar assembly. With our invention the grille bars may be located any preselected distances apart, they can be located so as to be disposed at an angle to the plane of the grille or the several bars may be disposed at different angles to the plane. The construction lends itself admirably for the production of grilles having curved form or a completely cylindrical form. The assembly of the grille bars and their spacing is performed in a particularly efficient and economical manner by reason of the novel constructions which we have devised.

An understanding of the invention for the attainment of the ends stated, as well as many others not at this time particularly enumerated, may be had from the following description, taken in connection with the accompanying drawings, in which:

Fig. 1 is a perspective view of the grille bar assembly made in accordance with our invention and which may be mounted upon a variety of supports therefor to make completed grilles.

Fig. 2 is a perspective view and section showing such grille bar assembly mounted upon an open rectangular frame support.

Fig. 3 is a horizontal section through the structure shown in Fig. 2.

Fig. 4 is a horizontal section of a modified form of grille bar support wherein the grille produced has a curved or arcuate form.

Fig. 5 is a perspective view showing a vertical cylindrical grille in accordance with our invention.

Fig. 6 is a vertical section through the lower end portion of the grille shown in Fig. 5.

Fig. 7 is a fragmentary elevation illustrating the manner in which the grille bars at their ends are assembled with the coiled wire upper and lower connections therefor.

Fig. 8 is a fragmentary enlarged vertical section through one end of a grille bar connected with said coiled wire end member.

Fig. 9 is a fragmentary elevation of the upper end of a grille bar.

Fig. 10 is a similar fragmentary perspective view thereof.

Fig. 11 is a horizontal section showing a slightly modified form of construction.

Fig. 12 is a perspective view of the upper end of grille bars used in the assembly shown in Fig. 11.

Fig. 13 is a fragmentary elevation showing a slightly different form for the coiled wire upper and lower connections for the bars, and

Fig. 14 is a similar view showing the manner in which a grille bar is held thereby.

Fig. 15 is a view similar to Fig. 14 showing a modified coil structure.

Like reference characters refer to like parts in the different figures of the drawings.

The grille bar assembly comprises upper and lower lengths 1 of closely coiled wire of small diameter, the wire being coiled like a helical spring having a uniform diameter throughout its length and with the coils in direct close contact with those next adjacent. The grille bars 2 extending vertically between the coils 1 are of flat metal and may be of any selected length. At each end they are provided with laterally pressed integral knobs or buttons 3, as shown in Figs. 8, 9 and 10, which are off-set to one side of the planes of the bars on which they are integrally formed.

In assembling the coiled wire upper and lower members 1 may be stretched and elongated to spread the coils as indicated in Fig. 7, whereupon the knobs or buttons 3 at the ends of the bar 2 may be inserted between any two adjacent coils. The bars may be located at either equal or unequal distances apart from each other. After the bars have had their ends thus positioned, the coiled wire members 1 are released and the coils come together, as in Figs. 1 and 8, retaining the bars in secure connection with and assured against any accidental disconnection from the coiled wire members 1. A unit is thus provided which may be of any desired length in accordance with a predetermined or preselected length for the upper and lower members 1, and in which the bars may be of any predetermined length, as may be selected. Such unit is adapted to be mounted in numerous ways on many and various types of supports.

In Fig. 2 an open rectangular frame having upper and lower sides 5 and vertical ends 6 made of sheet metal and of right angle form in cross section is provided, the vertical legs of the upper

and lower members 5 extending toward each other, and the end members 6 also having vertical legs extending inwardly toward each other. Retaining bars 7 of Z-bar form, as shown in Fig. 2, may have one terminal flange thereof spot-welded or otherwise permanently secured to the inner sides of the vertical legs of the members 5, thus providing troughs to receive the coiled wire members 1 and position the grille bars vertically in the frame. End bars 2, as shown in Fig. 3, may be located against the ends of the coiled wire members 1, and angle bars 9 have inwardly extending legs thereof which are located against the end bars 2, as shown in Fig. 3, while the other legs are secured, as by screws or equivalent fastenings to the inwardly extending legs of the ends 6 of the open rectangular grille frame.

With such construction the grille bars are parallel to each other and lie in vertical planes perpendicular to the plane of the grille frame. By twisting the upper and lower end portions of the bars 2, as indicated at 4 in Figs. 11 and 12, the intermediate major portion of the bars 2 may be disposed at an acute angle to such plane. The degree of the angle will depend upon the amount of twist given to the bars at the points indicated at 4, and may be varied; for in a grille bar assembly a plurality of bars 2 may have different degrees of twist at their ends, thereby locating the several bars at different angles to the plane of the grille frame. An indefinite variety of assemblies may be provided as is evident, insofar as the location of the planes of the intermediate major portions of the bars 2 with respect to the plane of the supporting frame is concerned.

The coiled wire members 1 are flexible and therefore may take substantially any curved form desired. In Fig. 4 a supporting frame is provided having a lower base member 10 which is substantially a segment of a circle. At the curved edge is an upwardly extending flange or leg 12, at the ends of which are vertical frame bars 11. A curved Z-bar structure 7a, similar to the Z-bar 7 in Figs. 2 and 3, is connected at the inner side of the flange 12 and in the trough provided thereby the lower coiled wire member 1 is received. The upper structure will be a duplicate, being merely reversed in position and will have an upper Z-bar trough provided to receive the upper coiled wire member 1 of the grille bar assembly. Vertical bars 13 having terminal flanges 14 are secured at the inner sides of the vertical sides 11 of the frame, the flanges 14 bearing against the end bars 2 of the assembly, and as shown in Fig. 4, such flanges 14 may be inserted between the same coils that the end bars 2 are inserted. This provides a grille having a curved form and with the bars 2 located in radial planes which on extension would meet at the center of curvature of the flange 12.

In Fig. 5 the grille bar assembly comprised of the plurality of vertical bars 2 and the upper and lower coiled wire members 1, may be shaped into a substantially cylindrical form and located between upper and lower supporting discs 15 of sheet metal which have annular flanges 16 extending toward each other, the coiled wire end members 1 lying within the flanges 16. The upper and lower discs 15 will be bound together by rods 17 within the bars 2 and paralleling the same, having headed ends, said rods also passing through an annular ring 18 which is of angle form in cross section, having an annular leg concentric with the adjacent flange 16 and a horizontal leg bearing against the inner side of

each disc 15. With the last described construction any air, either under forced or natural draft, if passed through a suitable opening in one of the discs 15, will pass outwardly between the spaced apart bars 2.

In the other forms of structure shown in Figs. 2 and 4, the grilles shown may be connected at the end of an air conduit or at an opening in a wall where such air conduit has an outlet and the air will pass into a room or other enclosure between the spaced apart bars 2.

In Figs. 13 and 14 the coiled wire member 1a shown is made by winding a plurality of wires into a coil with the contiguous coils of the plurality of wires tightly engaging each other. Where a single wire is wound into a coil as previously described, the bars 2 of the structures shown in Figs. 8, 9 and 10 will be located in planes substantially perpendicular to the longitudinal axis of the coiled wire member, but where a coil is made of a plurality of wires simultaneously wound into the coil, the contiguous coils are located at an angle to the axis so that plain bars of the type shown in Figs. 9 and 10 will be disposed at the same angle to the longitudinal axis of the coiled wire connecting members 1a. The angle will vary with the number of wires used in making a coiled member. This is a method of locating the bars 2 at a desired angle instead of forming them as in Fig. 12 with the twist indicated at 4.

The coil structure shown in Fig. 15 may be used in place of the multiple strand coil shown in Figs. 13 and 14. In this structure a single strand of flat material having considerable width is wound into a helical coil, the coils advancing at a considerable angle relative to the axis and providing the desired inclination of the grille bars which are located at intervals between the turns of the coil. The width of the flat piece of the coil will determine the angle relative to the axis provided that the coil is comparatively closely wound as is intended.

From the foregoing it is evident that we have provided a particularly novel and effective grille construction and especially a grille bar assembly adapted to be mounted in various ways upon suitable supports therefor. The coiled wire members 1 are very easily formed in indefinite lengths and may be cut to any preselected lengths wanted. The grille bars of flat metal will have the knobs or buttons 3 at the ends thereof very quickly fabricated by a simple stamping operation. The assembly as previously noted, is simple, requiring no tools or the services of skilled labor.

The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

We claim:

1. In a structure of the class described, two spaced apart longitudinal coiled wire members having the contiguous coils thereof normally in close contact, spaced bars extending between the coiled wire members and having their ends received between adjacent coils thereof, the ends of said bars within the coils having means to retain the bars in connection with said coiled wire members.

2. A construction of the class described, comprising, two spaced longitudinal stretchable coiled wire members, bars spaced apart from each other extending between said members and having a laterally off-set knob pressed from the bars at each end thereof, the end portions of said bars extending between contiguous coils of

said members and with said knobs located within said members, as specified.

3. A grille bar construction comprising, spaced elongated coiled wire members each formed from wire helically coiled and with the coils normally in close engagement, and flat bars spaced from each other extending between the coiled wire members and having their end portions received between contiguous coils thereof, combined with means at the ends of said bars received within the said members for retaining the bars in connection with said members.

4. A grille comprising an open supporting frame, and a grille bar construction located at the opening of the frame comprising, upper and lower longitudinal coiled wire members helically wound and having adjacent coils normally in close contact to each other, flat metal grille bars extending between said wire members having their opposite end portions received between certain of the contiguous coils of the wire members, said bars being located in spaced apart relation to each other, and means on the upper and lower sides of said open frame receiving and holding said coiled wire members whereby the open side of the frame is traversed by a plurality of bars extending thereacross, as specified.

5. A construction containing the elements in combination defined in claim 4, combined with means attached to the ends of said open frame engaging against each end of said coiled wire members, as specified.

6. A grille comprising, an open frame having upper and lower parallel sides and vertical ends, a member secured to each the upper and lower side of said grille frame providing with said sides of the frame longitudinal troughs having open sides facing toward each other, a longitudinal coiled wire member located in each of said troughs, each of said coiled wire members being formed from wire helically coiled with the coils normally in close contacting engagement, and vertical bars spaced apart from each other extending across the opening in said open frame from the upper to the lower sides thereof the ends of said bars being received between adjacent coils of said wire members and retained thereby.

7. A construction containing the elements in combination defined in claim 6, combined with means at the end portions of said bars received and located within said coiled wire members, thereby contacting the bars to said coiled wire members against disengagement.

8. A construction containing the elements in combination defined in claim 6, combined with means attached to said grille frame adjacent the ends of said troughs and bearing against said coiled wire members adjacent each end thereof to hold the same from longitudinal expansion and lock the ends of said bars against disconnection from said coiled wire members.

9. In a structure of the class described, two coiled wire members spaced from each other, each comprised of a plurality of lengths of wires wound into a single longitudinal coil, the contiguous coils thereof bearing against each other and being located at an acute angle to the length of the wire members, and flat bars extending between said coiled wire members having their end portions received between coils of said members, said bars at each end carrying means received within said coiled wire members to insure a connection of the bars thereto, the planes of said bars being at substantially the same acute angle to the length of the coiled wire members as are said coils.

10. The herein described grille bar assembly comprising, a plurality of flat bars spaced from each other, each of said bars at each end having a laterally off-set knob formed thereon, and a longitudinal flexible member extending across each of the ends of all of said bars, said member being formed of wire into a continuous longitudinal coil, and the end portions of said bars extending between contiguous coils at spaced apart distances in the lengths of the members, said laterally extending knobs being located within said longitudinal flexible members and extending to one side of the bars, thereby interlocking the bars with said flexible members.

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