

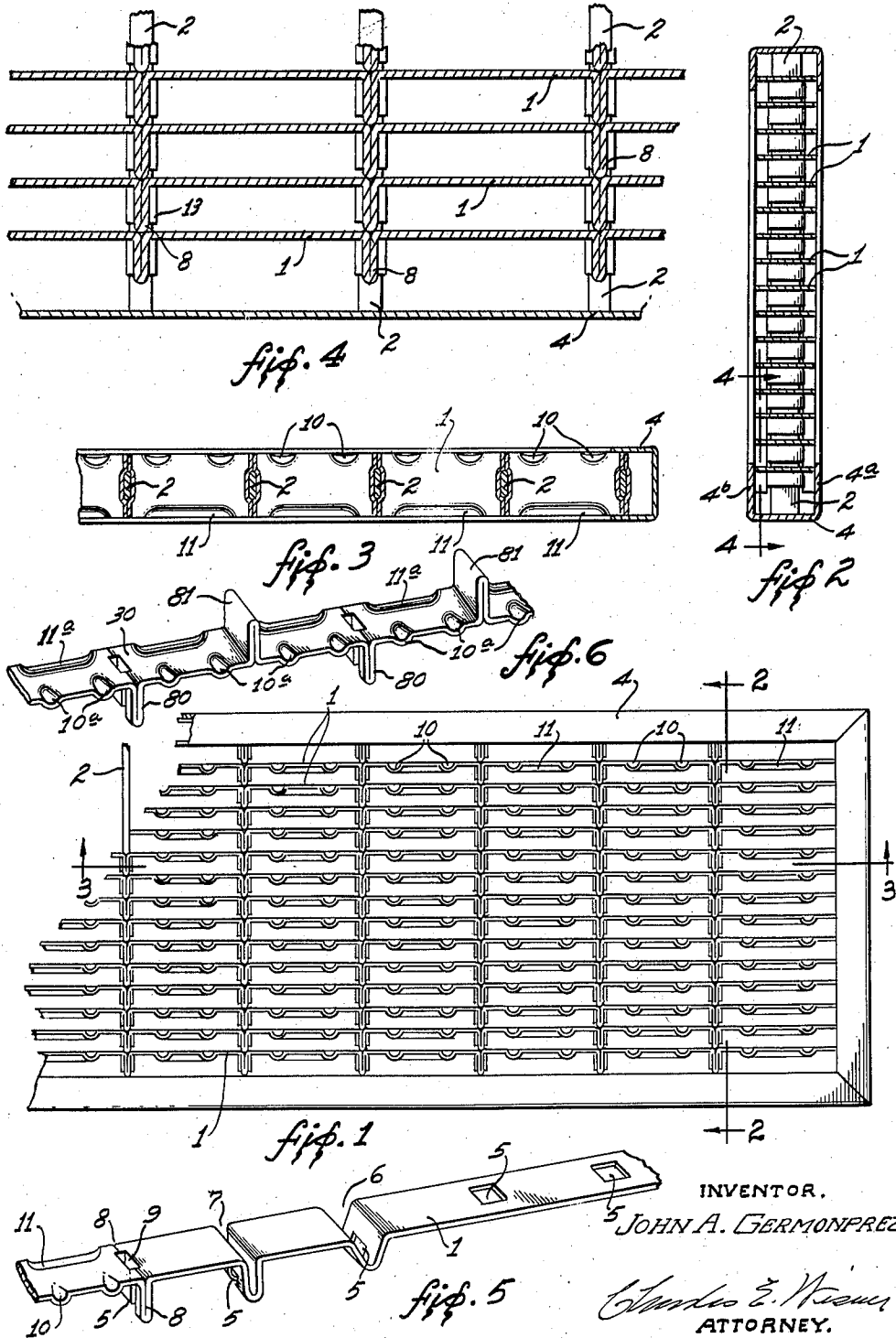
Dec. 20, 1938.

J. A. GERMONPREZ

2,140,993

GRILLE AND METHOD OF MAKING THE SAME

Filed Feb. 23, 1934



INVENTOR.  
JOHN A. GERMONPREZ.

Charles E. Wisner  
ATTORNEY.

# UNITED STATES PATENT OFFICE

2,140,993

## GRILLE AND METHOD OF MAKING THE SAME

John A. Germonprez, Detroit, Mich., assignor, by  
mesne assignments, to Barber-Colman Com-  
pany, a corporation of Illinois

Application February 23, 1934, Serial No. 712,550

3 Claims. (Cl. 98—114)

This invention relates to grilles for covering the ends of discharge outlets in air conditioning systems and the like, and more particularly to grilles embodying a series of spaced parallel strips or fins.

The general object of the invention is to provide a novel fin construction for grilles or the like which is simple and inexpensive to manufacture, which facilitates assembly of the grille structure, and which presents a neat and attractive appearance.

A more specific object is to provide a fin construction in which lateral projections for spacing the adjacent fins of the grille apart are bent from longitudinally spaced portions of the fins and constructed in a novel manner to enable the fins to be secured together through the medium of flat bars extending through the adjacent fins alongside the spacing elements.

A further object is to provide a novel method of forming grille fins of the above character.

Another object is to provide a forced air grille composed of a plurality of thin fins with means of an advantageous character for firmly holding the fins in spaced relation without the use of solder or the like.

These general objects and other objects and features of the invention are hereinafter more fully described and claimed, and the preferred form of construction of a grille embodying my invention is shown in the accompanying drawing in which—

Fig. 1 is an elevation of a portion of a grille including a frame.

Fig. 2 is a vertical section taken on line 2—2 of Fig. 1.

Fig. 3 is a horizontal section taken on line 3—3 of Fig. 1.

Fig. 4 is an enlarged section taken on line 4—4 of Fig. 2.

Fig. 5 is a perspective view of a grille strip or fin indicating its manner of formation.

Fig. 6 is a perspective view of a slightly different form of fin.

The grille is constructed of a series of fins 1 secured in spaced relation on bars 2. For this assembly on the bars, the strip is folded at intervals, the folding being indicated in Fig. 1 at 8, and the bottom of the fold is apertured and the fins slipped over the bars with the fold 8 forming the spacing element for the fins. The bars tightly fit in the recess formed in the fold of the fins and this relationship of the bar and the folded portions of the strips provide a comparatively large bearing surface on the bar which is

small in previous structures being only the thickness of the strip. Previous structures in which the strip is merely apertured to receive the bar required the strips to be mechanically spaced in assembling the bars and strips and then soldered in place. Such labor of spacing and of soldering and the material utilized in such previous strip are eliminated by my method of forming the strips in a manner to be self-spaced in assembling on the bars.

Subsequent to the assembly of a certain number of strips and bars therefor, a framework preferably of sheet metal indicated at 4 encloses the edges and ends of the assembled unit and by reason of the large bearing surface between the bars and the strips, the unit resists strains tending to warp the same out of a plane. In the former constructions in which the grille strip is pierced and not folded at the point through which the bar extends, much care is required to be exercised in the handling of the same prior to the dipping or soldering operation for securing the strips to the bars and often resulted in a finished grille being distorted or warped in its plane.

My character of grille strip lends itself readily to making in continuous length from which strips of the desired length for a grille of certain size may be cut and in Fig. 5 is shown a strip in perspective view indicating the progressive steps in the formation of the grille strip. The strip is to be understood as being passed in the direction toward the right at Fig. 5 through consecutive punch and die elements, the first of which provides an aperture 5 in the body of the strip and as the strip is passed from the point of formation of the aperture passes to another instrumentality which forms a V across the body thereof at the aperture. In the next succeeding operation the walls of the V are folded to practically parallel position as indicated at 7.

The side edges of the fold in the next step are folded tightly together as indicated at 8 on opposite side edges of the strip leaving a recess 9 centrally of the strip between the walls of the fold and in alignment with the aperture 5 in the bottom thereof into which the bar is to be inserted. Thereafter, the opposite edges of the strip are bent to form air dissipating or diverging elements 10 on one edge of the strip in spaced relation between the successive folds and on the opposite edge a bent portion 11 on the same side of the strip as the elements 10. When the grille is arranged with the bent portions on the discharge side they provide a means for causing the air current passing between the strips to be discharged

at less than a right angle to the face of the grille. By suitable punch and die instrumentalities (not shown), the strip is shaped in a progressive manner and may be made in as long lengths as desired and subsequently cut to the lengths required in the formation of a grille of a certain size.

Subsequent to the formation of the strip in the general manner indicated, the strips are fastened together by means of the bars 2. These are shown on an enlarged scale in Fig. 4 and the recess 9 formed between the side walls of each finished fold is a tight fit on the bar so that it is necessary to employ force in the insertion of the bars. Thus the strips are bound together solely by frictional engagement between the inner side faces of the folds and the opposite side faces of the bars. This insures that the strips will be firmly held in proper assembled relation and moreover prevents any rattling noise incident to the rush of air through the grille as might occur with a loose fit between the strips and bars. It will be observed that the bars 2 are relatively thin, being made of sufficient thickness only to possess the desired degree of rigidity. With the bars disposed edgewise across the strips and made of a thickness substantially corresponding to the thickness of the folds at the edges of the fins, only a slight increase in the thickness of the folds incident to the reception of the bars becomes necessary, thereby avoiding any undue increase in the resistance interposed by the folds to the passage of air through the grille.

It will also be noted from Figs. 1 and 4, that the folded edge portions 8 of each fold project a slightly greater distance from the face of the grille than the central portion therebetween. This will be readily observed in Fig. 4 in which the central portion forming the recess for the bar is indicated at 13 while the bottom edge of the loop portion 8 engages the next lower strip 1. This formation providing a greater length of fold portion at opposite edges of the strip than at the center is secured by making the aperture 5 of greater width longitudinally of the strip than the bar to be inserted therein. Thus when the strip is folded on a center line of the aperture 5 the walls at the opposite edges of the aperture taken longitudinally of the strip assume a position above the lower edge of the fold. It will be noted that the formation of the grille strip is comparatively rapid and that the assembly thereof on the bars is also rapid in comparison to the methods heretofore employed in that the strips are self-spacing and are merely forced onto the bars with the folds of one strip in contact with the next strip of the series. Therefore the unit consisting of the bars and strips thus assembled may be made of the exact size in length of bar and length of strip. Thus, upon completion of the assembly of the bars and strips in a unitary structure, the sheet metal frame 4 may be placed about the periphery of the assembled unit without necessity of further finishing the same for reception of the frame.

The frame 4 shown is of channel form in cross section having the side flanges 4a and 4b which engage over the ends and opposite side faces of the grille but other forms of frame element may be utilized. The bent spaced portions 19 on one edge of the strip and the longer bent portions 11 on the opposite side of the strip between adjacent folds as heretofore stated, provide a diffusing means for the air stream passing between the strips and the character of the action on the air stream depends on which edge of the strip faces the discharge side of the grille. The grille may be

used with either edge as the discharge edge as may be desired to meet different conditions in use. This grille may be utilized in various places as, for instance, in the opening of a cold air duct into a room where the inflowing air is required to decrease the temperature of the air in the enclosed space. For such purpose the grille and the air conduit to the grille are usually adjacent the ceiling of the room. If hot air is to be passed through the grille it may otherwise be positioned in respect to the room, for instance near the floor line. The grille is also useful wherever air is flowing from one compartment to another as in refrigerating apparatus in which the grille will be placed in the wall between the storage compartment and the cold compartment. Thus wherever a grille may be utilized or is required for passage of air, the grille forming the subject matter of this invention may be utilized.

A slightly different form of fin is shown in Fig. 6. In this form the alternate folded portions are on opposite sides of the strip, that is, the strip 30 has its edge formed with the depressions 10a on one side and 11a at the opposite edge and the folded parts 80 on the one side are like those indicated at 8 in Fig. 5 while on the opposite side the folded portions 81 are on the opposite side. The folded portion 81 is not identical in form with the portions 80 as the fold 81 need not of necessity be formed with an aperture or recess for a bar but may be if desired. By the form of fin shown in Fig. 6, the number of bars necessary in forming the grille unit is reduced and this is possible due to the fact that the folded portion 81 of one strip is in contact with the contiguous face of an adjacent strip and the folded portions 81 of the series of strips are thus in alignment and in comparatively tight contact with the next strip of the series thus sustaining the strips from deflection between the bars.

It is believed from the foregoing description that the grille according to the invention is of simple and unique character of construction and arrangement of parts; that various changes can be made in the structure or relationship of the parts, as for instance by making the alternative folded portions on opposite sides of the strip rather than on the same side dispensing with the bent parts 10 or 11 upon one edge of the strip or utilizing a frame of different character of construction, and that, in the structure as shown or as may be revised within the scope of the appended claims, the various objects of the invention, including inexpensiveness due to rapidity of construction and assembly and avoiding necessity of soldering or dipping the assembled bars and strips in a cementitious solution are attained.

Having thus briefly described my invention, what I claim and desire to secure by Letters Patent of the United States is—

1. A fin for a grille or the like comprising a sheet metal strip having a plurality of U-shaped lateral projections bent from longitudinally spaced portions of the strip, each of said projections having parallel side walls disposed substantially in surface contact at their edges and spaced apart intermediate said edges to define a parallel-walled passageway extending longitudinally of said projection, and having one open end terminating substantially in the plane of the fin and the other end terminating at a point between the closed end of said projection and the body of the fin.

2. A grille structure comprising a plurality of narrow strips of thin sheet metal supported with

opposite side faces in closely spaced relation to form air guiding fins and having a plurality of rows of spacing elements spaced apart transversely of the grille, the spacing elements constituting said rows being in the form of transverse folds bent from said strips and having apertures at their bight ends disposed between the opposite edges of the fins, and means for holding the fins tightly together including solid rigid retaining members inserted between and disposed in frictional engagement with the inner side faces of the aligned folds of said rows and through the apertures thereof, said members being of small thickness in a direction longitudinally of the fins to minimize the resistance to air flowing through the grille.

3. A forced air grille comprising a plurality of narrow fins made from thin strips of sheet metal bent at longitudinally spaced points to form a plurality of flat transverse folds having apertures extending therethrough transversely of the fins, and means for retaining said fins in assembled relation with the folds on the adjacent fins in alinement, said means comprising a series of bars each inserted through the apertures of a row of folds and having a force fit with the walls of the apertures so as to provide firm frictional engagement between the parts constituting the sole means for holding the fins together.

JOHN A. GERMONPREZ. 15