

Aug. 25, 1936.

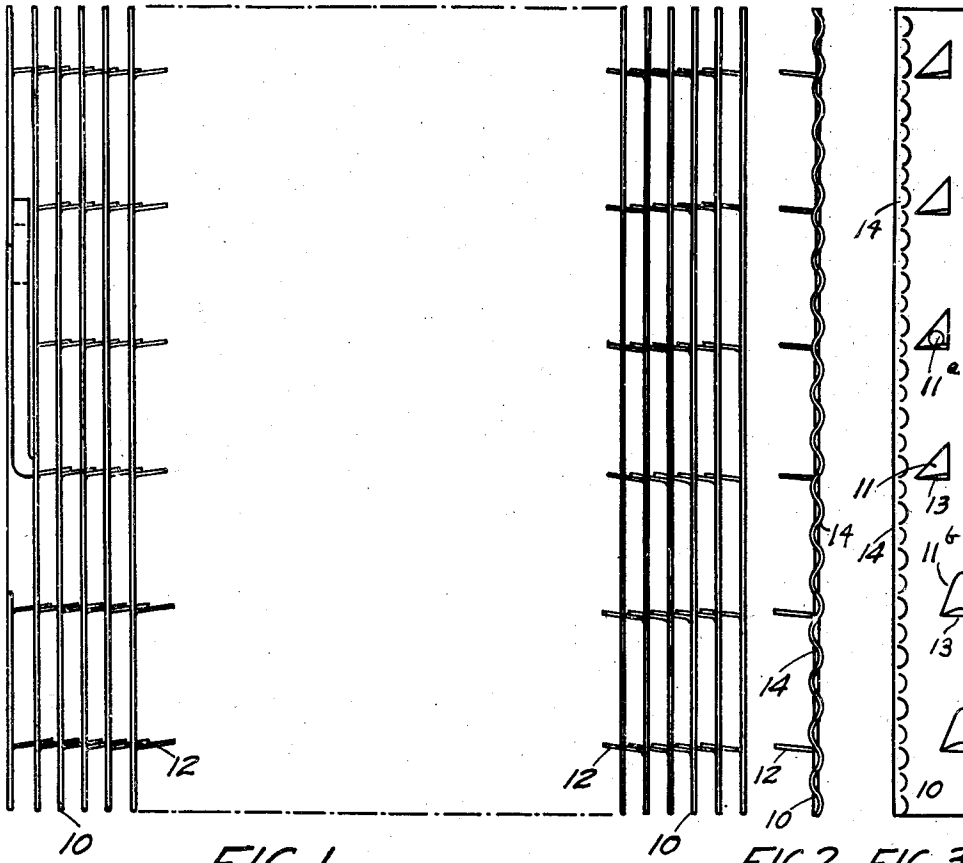
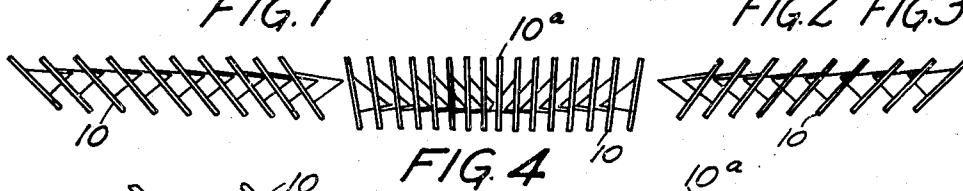
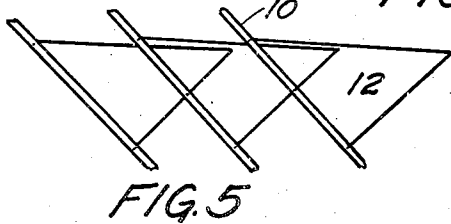
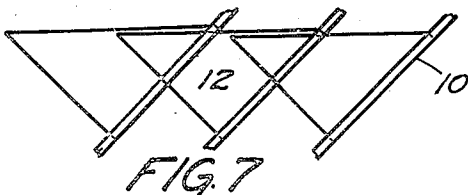
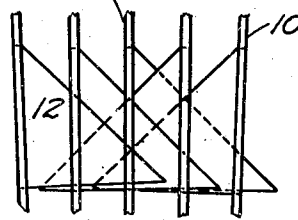
F. M. YOUNG ET AL

2,051,929

WALL GRILLE

Filed March 12, 1934

2 Sheets-Sheet 1



INVENTORS
Fred M. Young
Leon M. Young
BY A. S. Krotz
ATTORNEY

Aug. 25, 1936.

F. M. YOUNG ET AL

2,051,929

WALL GRILLE

Filed March 12, 1934

2 Sheets-Sheet 2

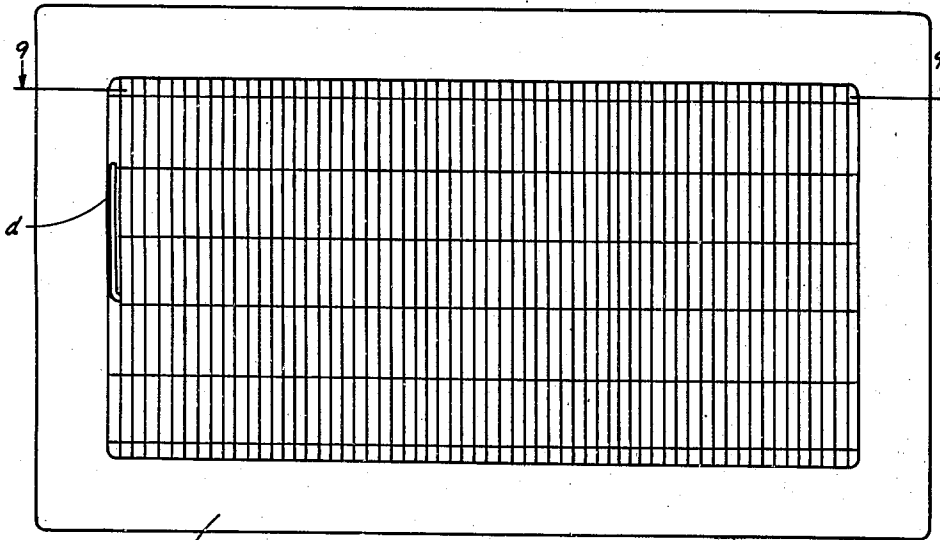


FIG. 8

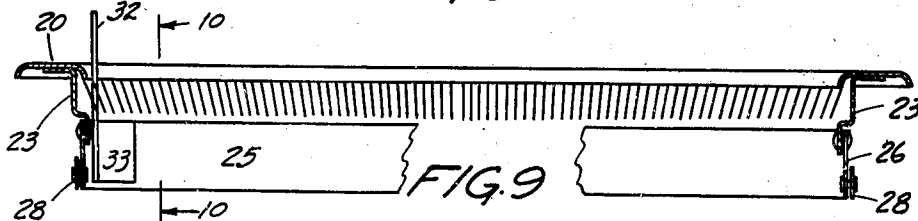


FIG. 9

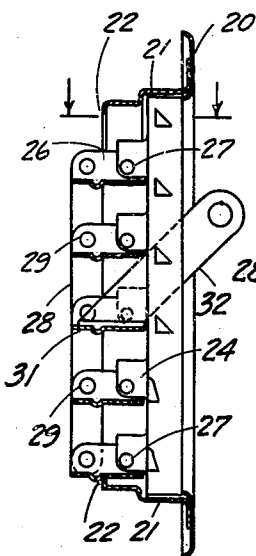


FIG. 10

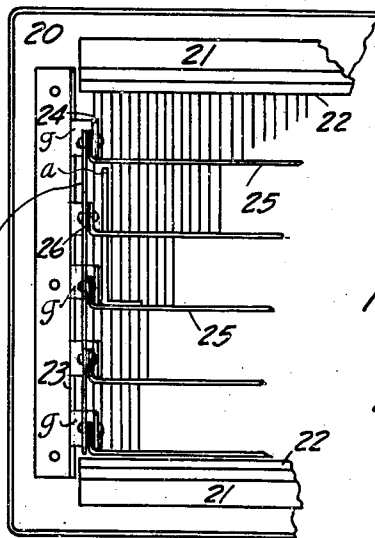


FIG. 11

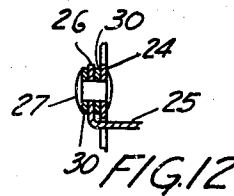


FIG. 12

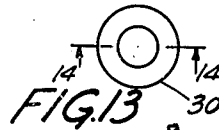


FIG. 13

FIG. 14

INVENTORS
Fred. M. Young
Leon M. Young
BY ASKROTH
ATTORNEYS

UNITED STATES PATENT OFFICE

2,051,929

WALL GRILLE

Fred M. Young and Leon M. Young, Racine, Wis.,
assignors to Young Radiator Company, Racine,
Wis.

Application March 12, 1934, Serial No. 715,190

8 Claims. (Cl. 98—114)

The object of our invention is: first, to deliver the air from the grille, fan like; second, to evenly spread the passage of air throughout the grille assembly; third, to reduce surface friction to a minimum; fourth, to prevent whistling or air interference noises; fifth, to provide a unit grille core assembly which may be easily fitted into any desired type of frame or housing; sixth, to provide a grille which is strong, light, inexpensive and pleasing in appearance; seventh, to provide a grille core assembly without the use of bolts or independent spacing parts; eighth, to provide a grille core which, when assembled in a holding jig, a convenient means is provided for bonding the assembly together; ninth, to provide a grille which can be assembled into any length and adapted to any degree of air spread without changing the part from which the grille is made; tenth, to provide novel indentations on the fin edges and properly spaced to thereby give the assembly face a pleasing appearance.

A further object of our invention is to provide a suitable housing for a grille of the class, having suitable air controlling means and means whereby the assembly is made without the use of bolts or screws and is simple, light and pleasing in appearance.

We accomplish these objects by means of a novel fin strip from which a number of suitable spacing members are punched free and bent at right angles as an integral part thereof, whereby when the fin strips are closely spaced the spacing members will pass through the opening left by the adjacent spacer and lay thereon, thus to present an easily bonded joint and a thin surface which is positioned parallel to the direction of air flow, and whereby the fin angle and spacings may be variably positioned whereby they may be made to suit any desired installation, and further by means of a novel housing wherein the dampers and their supports form a separate assembly which may readily be attached, after the fin core has been placed into position and then act as a retaining means therefor.

To these and other useful ends our invention consists of matter hereinafter set forth and claimed and shown in the accompanying drawings in which:

Figure 1 is a fractional front elevation of our grille core structure having the fin strips in parallel relation both longitudinally and transversely.

Figure 2 is a front elevation of one of the fin strips with which the assembly is made.

Figure 3 is a side elevation of the fin shown in Figure 2.

Figure 4 is a fractional top elevation of our fin strip assembly or core, showing the ends and a fraction of the center portion, wherein the fins

are positioned at varying distances apart and at varying angles.

Figure 5 is an enlarged fractional top elevation showing the three left hand end fins as shown in Figure 4.

Figure 6 is an enlarged fractional top elevation showing five of the center fins as shown in Figure 4.

Figure 7 is an enlarged fractional top elevation of the three right hand end fins as shown in Figure 4.

Figure 8 is a front elevation of our improved grille as installed in our improved housing.

Figure 9 is a vertical section of the assembly taken on line 9 of Figure 8.

Figure 10 is an end section taken on line 10—10 of Figure 9.

Figure 11 is a rear fractional left end elevation of the assembly as shown in Figure 8.

Figure 12 is a fractional section of the damper hinge which pivotally carries the ends of the dampers.

Figure 13 is a plan view of the friction washer used in the damper hinges.

Figure 14 is a section taken on line 14 of Figure 13.

As thus illustrated the core assembly comprises a multiplicity of fin strips 10, which are formed and assembled into a core in the following manner:

The strips 10 are preferably made from narrow thin sheet steel strips of a length for a suitable width core. V shaped cuts are made in these fins in spaced apart relation, the freed portion being bent outwardly at a slightly less than right angle to the strip, as indicated in Figure 2, one edge of the cut being preferably parallel to the fin edge thus leaving a right angle triangle opening 11 as clearly indicated in Figure 3, and providing a projecting spacer element 12. Thus this spacer 12 has a right angle triangle shape, as clearly indicated in Figures 5 to 7 inclusive. The base 13 of the spacer is, as indicated, transverse to the fin edges.

In Figure 3, we illustrate a fin having six spacers, two of which are formed by cutting from the rear edge of the fin, forming an opening 11^b. One advantage in making use of this position in connection with opening 11, is to add to the longitudinal bending strength of the grille. Another plan we contemplate, is to space the two openings 11 and 11^b alternately. We also contemplate using openings 11^b separately, whereby the strips may be assembled from the rear, edgewise; whereas when position 11 only is used the fins must be inserted in the assembling jig sidewise.

In order to slightly stiffen the fin edges and present a pleasing appearance of the assembly, short narrow indentations 14 are formed on the front edge of the fins and alternately positioned

to thereby form a corrugation as shown in Figures 2 and 3, the corrugated edge thus formed is made to converge from opposite sides into the body of the fin, the indentation at the fin edge only, forming a perfect corrugation. They represent nearly half cones, the apexes of which end alternately on opposite surfaces of the fin; thus clearly, the passing air will be only very slightly retarded.

The manner of positioning the fins in the preferred form of core as indicated in Figure 4, is as follows: the center strip of the assembly is positioned at a transverse angle to the core and is designated in Figures 4 and 6, by numeral 10^a. The fin strips are placed into position on the left side of 10^a for example, one at a time until the desired number has been added. They are, however, held into spaced relation by means of a holding jig, whereby the rear space between fins is gradually increased and whereby the space between the front edges is gradually increased from 10^a to the end, but this increase is made greater than the rear spacing increase whereby the end fin will be positioned at an angle to the center of about 42 degrees, or thereabout, as indicated in Figure 4. The fins for the right half of the core are similarly positioned and held.

It will now be apparent why the openings 11 and spacers 12 are shaped and positioned as shown. The bottom of the openings 11 are, as indicated, adapted to receive the ends of the spacers of the adjacent fins. In the case of the center fins or when all of the fins are in parallel relation horizontally, the outer or rear edge portion of the spacers 12 will lie nearly parallel to this edge on the adjacent fin, (see Figure 6). However as the angle is increased these edges will part and assume different angles until at the end of the assembly the front edges of the spacers will be nearly parallel as indicated in Figures 5 and 7. However it will be noted that the fins on the right side of 10^a have necessarily been bent in the opposite direction as indicated in Figures 4, 6 and 7, to thereby provide for the opposite angle of these right hand fins. Otherwise the spacers on the right hand fins may be bent in the same direction by simply reversing the cuts in the fins.

Obviously when the fins are to be assembled in transverse parallel relation or nearly so, the spacers may be somewhat different in shape. For example, they may be cut triangular in shape wherein the base of the spacer would be at right angles to the fin edges and the apex would lie in a central position or nearly central position on the base of the adjacent spacer. Some slight change in angle would then be possible but to provide an angle of 40 or 45 degrees for the end fins, the spacers necessarily must have a shape similar to that shown in Figures 4 to 7 inclusive. If, however, all the fins are to be in transverse parallel relation, the spacers may have parallel sides in which case variable spacing would be possible but all fins would necessarily be in parallel transverse relation.

One of the principal advantages of our improved spacer is that the fins may be variously spaced apart so long as the contact between adjacent spacers is long enough to form an adequate bonding surface.

When our improved fin strips have been assembled and held into their desired relation one to the other, the assembly is positioned edge-wise as shown in Figure 3, so the spacers 12 are at the bottom of openings 11. A bar of bonding

material 11^a, of a length equal to the core is positioned one in each channel formed by the openings 11. This bar 11^a will then lie on the spacers as indicated in Figure 3. Heat is then applied by means of a torch or otherwise, whereby the bar is melted and flows between the spacers which when cool will be firmly bonded together, after which the holding jig may be removed. Thus we have provided by the use of our novel fin strip a complete grille assembly, compact, light, neat and at low cost, which will deliver the air as desired and present a minimum resistance to the air flow.

Because of surface friction air travels at greater speed in the center of a tube or conveyor than at the outer edge. It is equally true that with a common grille more air volume will be discharged at the center of the grille than at the ends. Applicants' gradually increased space between fins from the center toward the ends will tend to counteract this tendency. However with applicants' device air may be delivered, fan like, at evenly distributed speed or volume.

Obviously there are no abrupt bends nor wide surfaces to interfere with a free unobstructed airflow in applicants' grille. The air is gradually diverted in narrow strata, therefore no eddy currents are created all of which will increase the efficiency of the grille and cause quiet operation.

One of the objects of the oppositely positioned indentations in the fin edge is to present a pleasing appearance at all angles of vision and to fade out the visibility of the gradually increased spaces between fins, thus the entire grille surface will have a pleasing unbroken appearance.

Obviously many detail changes in the shape of the spacers, the shape and position of the indentations and spacings of the fin strips may be made without departing from the spirit of applicants' invention. For example the grille may be assembled into a horizontally convex or concave unit, to thereby be suitable for a curved wall and the like. Or the grille may be made in a complete circle to thereby discharge the air in all directions from a unit depending from the wall.

We will now describe our novel housing which is especially adapted to hold our core assembly, as illustrated in Figures 8 to 14 inclusive.

The main frame of the housing is designated by reference numeral 20. This frame is provided with suitably shaped side members or plates 21—21. These plates are preferably spot welded to the frame as indicated after the grille is placed into position. The balance of the housing comprising the ends and damper instrumentalities, whereby to regulate the air flow, is made up into a unit assembly and placed over the grille and preferably spot welded to the frame 20. The plates 21 are provided with inwardly projecting edges 22, the purpose of which will appear later. We provide novel means for air control as illustrated in Figures 9 to 14 inclusive wherein end members 23—23 are provided, having an inwardly projecting offset, which is adapted to form a recess for the grille unit and also having rearwardly projecting ears 24. The end members 23 answer as a base upon which to mount the damper blades and their connections. These parts are all first assembled into a unit and then placed over the grille and made permanent by spot welding members 23 to the frame 20.

The damper plates 25 at their ends are bent

at right angles forming projections 26. At one side these projections are friction pivoted to ears 24 by means of rivets 27. Between these pivoted parts, a curved spring washer 30 is positioned. Thus when the rivets 27 are properly set the washer will be somewhat flattened, thereby to provide a friction surface which will yield to manual effort, but will not permit the position of the damper to accidentally move out of a predetermined position. A parallel bar 28 is similarly friction pivoted to the other end of projections 26 as at 29 as clearly indicated in Figure 10. Thus the damper plates 25 will be caused to pivotally operate on projections 24 simultaneously.

Obviously when the damper plates 25 are moved to a closed position, they will be in parallel alignment on the same plane and on the same plane as projections 22. Projections 26 will also be aligned, thus to prevent passage of air into the grille from the sides, ends or between the damper plates. In Figures 9 to 11 inclusive, the damper plates are shown as in the wide open position or in a parallel position to the direction of air flow.

The washer 30 is preferably made from spring material and having a single curve, as indicated in Figure 14, is superior to a cup shaped washer and will continue to exert a fixed pressure on the joint for an indefinite period.

In wall grilles of this class it is desirable to provide means whereby the damper may be operated manually and whereby the position of the damper is readily perceived. We provide a lever 32, the inner end of which is bent at right angles forming a seat 33, which is suitably attached to one of the damper plates 25, as indicated whereby the lever may extend forwardly and upwardly through an opening in the assembly when the damper is open. By observing the position of this lever the attendant may readily determine the relative position of the damper. One of the advantages of applicants' damper structure is that the blades are each friction held at four points, thus the washers each need not be very severe, but combined they will insure against accidental movement of the damper but may be easily moved manually.

Having thus shown and described our invention we claim:

1. A grille core comprising a multiplicity of closely spaced fin strips each having a number of spaced apart openings formed by cut free portions which are bent out transversely and extend into adjacent openings and overlap adjacent spacers thus forming a channel having a continuous bridge formed by said spacers, a piece of solder the length of said channel positioned on said bridge and heat applied to thereby bond said overlapping spacers.

2. A grille, comprising a multiplicity of closely spaced fin strips each having a number of spaced apart spacer portions cut free and bent out at right angles and extending through adjacent openings left by the adjacent spacer and overlapping the base of said adjacent spacers and being bonded thereto to thereby form a unitary grille core, the center fin of said core positioned at right angles transverse to said core, said fins spaced apart at an ever increasing distance and diverging angles toward the ends, whereby air is discharged fan like from said grille.

3. A grille, having a greater length than width, comprising a multiplicity of closely spaced transversely positioned fin strips and longitudinal connecting means forming a rigid unitary structure, said fin strips positioned at ever increasing diverging angles from the center fin toward the ends whereby air passing therethrough will be discharged in strata at an ever increasing diverging angle, said longitudinal connecting means comprising portions cut free from said strips, one end being left intact and bent on a line in direction of air flow whereby said portions extend transversely thereby to overlap adjacent portions and being bonded thereto.

4. A wall grille, comprising a multiplicity of closely spaced fin strips having a number of spacers cut free therefrom and bent out at a transverse angle forming right angle triangle spacer members which project through the openings left in the adjacent fin, said spacers overlapping and bonded together.

5. A wall grille, comprising a grille core having a housing, said housing comprising a front frame having rearwardly projecting side members with offsets adapted to engage the rear edge of said core, a damper device comprising end members having spaced apart rearwardly extending projections, a number of spaced apart damper blades the ends of which are bent at right angles and each having pivotal connections to said rearward projections, parallel bars pivotally connected to said damper ends on the opposite side from said other pivots, a lever attached to one of said blades and adapted to project through said grille whereby said blades may be manually operated and their position observed therefrom.

6. A grille fin, having a number of spacer projections forming an integral part thereof, comprising a narrow strip, a number of triangular in form spacer portions cut free from the body of said strip, said cut at one side being parallel to the edges of said strip, said portion bent on a line at right angle to and extending at right angle from said fin.

7. A grille having a greater length than width, comprising a multiplicity of closely spaced transversely positioned fin strips and a number of horizontally positioned spacers forming a rigid unitary structure, said fin strips in parallel relation and positioned at varying angles whereby the air passing therethrough will be discharged fan-like, said spacers comprising portions cut free from said strips, one end being left intact on a line in direction of air flow, said freed portion extending transversely thereby to overlap the adjacent spacers and being bonded thereto.

8. A grille of the class described, comprising a multiplicity of closely spaced fin strips positioned in parallel relation, each fin strip having a number of spaced, elongated portions cut free lengthwise to said fins, one end of said portion being left uncut and bent outwardly on a line at right angle to said fin strip, said portions being left flat and overlapping the portions on the adjacent fin strips and being bonded thereto, whereby a number of spaced bars are formed by said portions which are positioned edgewise to the direction of air flow and whereby said fin strips are secured one to another.

FRED M. YOUNG.
LEON M. YOUNG.