June 17, 1941. G. F. DRAKE 2,245,908

GRILLE CORE

Filed Oct. 25, 1937

Fig. 2.

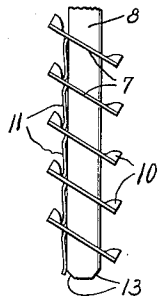


Fig. 1.

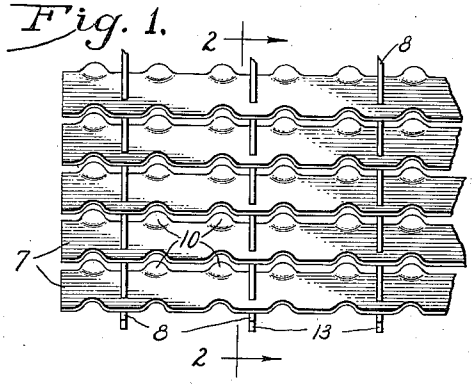


Fig. 3.

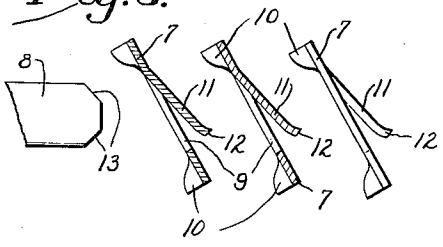
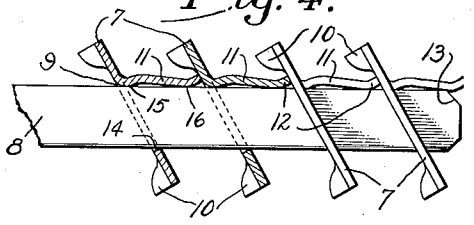


Fig. 4.



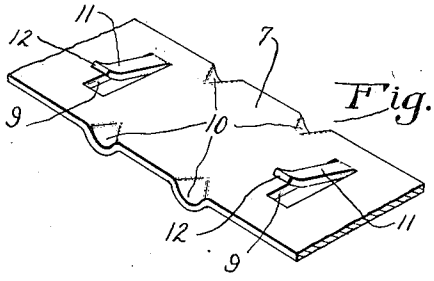
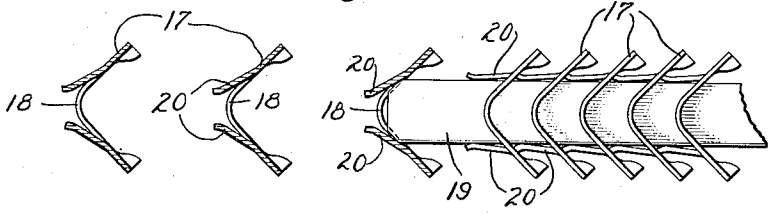


Fig. 5.

Fig. 6.



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2,245,908

GRILLE CORE

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Application October 25, 1937, Serial No. 170,752

5 Claims. (Cl. 189—82)

This invention relates to the cores of grilles which are used for covering openings in walls, doors, and the like, and has more particular reference to grille cores comprising a series of sheet metal fins joined by separate connecting bars extending through the fins.

The general object of the invention is to provide a novel means for holding the fins in spaced relation along the connecting bars which means permits the fins to be disposed at an angle to the face of the grille, to be of different cross-sectional shapes, and avoids the necessity of soldering the fins and connecting bars together.

A more detailed object is to provide a grille core of the above character in which the fins are held in spaced parallel relation by tongues which are formed from the metal punched out in cutting the connecting bar apertures in the fins, said tongues bearing frictionally against one edge of the connecting bar and abutting against the adjacent fin.

The invention also resides in the novel method of forming the grille core.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawing, in which

Figure 1 is a fragmentary elevational view of a grille core embodying the novel features of the invention.

Fig. 2 is a cross section taken along the line 2—2 of Fig. 1.

Figs. 3 and 4 are cross-sectional views of the fins illustrating different steps in the method of assembly.

Fig. 5 is a perspective view of one of the grille fins before insertion of the connecting bars.

Fig. 6 is a view similar to Fig. 4 illustrating a modified form of the invention.

While the invention is susceptible of various modifications and may be practiced in various ways, I have illustrated in the drawing and will describe here in detail the preferred embodiment and method. It is to be understood, however, that I do not intend to limit the invention by such specific disclosure but aim to cover all modifications and alternative constructions and methods falling within the spirit and scope of the invention as expressed in the appended claims.

Referring first to the form of the invention shown in Figs. 1 to 5, the grille core comprises a plurality of thin fins 7 supported in spaced parallel relation by a plurality of flat connecting bars 8 extending through rectangular alined apertures 9 in the fins. In this instance, the fins are flat and are disposed generally edgewise but inclined at a small angle relative to the direction of air flow through the grille. Each fin is composed of a thin strip of sheet metal, preferably mild steel, which may, if desired, be deformed at spaced points along its edges to form deflecting and diffusing elements 10.

The apertures 9 are formed by punching out portions of the fins corresponding in width to the thickness of the connecting bars 8 and in length to the width of the bars and the angle at which the fins are to be disposed. Thus, the length of the aperture is such that the opposite defining edges thereof bear against the side edges of the connecting bar as shown in Fig. 4 when the fin is disposed at the desired angle.

In accordance with the present invention, each punched out portion or tongue 11 resulting from formation of a bar aperture 9 is left integral with the fin proper at one short end of the aperture. Each tongue is bent away from the fin and in the assembled core extends along one side edge of the connecting bar. At its free end, the tongue abuts against the adjacent fin thereby positively holding the adjacent fins in the desired spaced relation. Preferably, the free end of each tongue is bent slightly relative to the body portion as indicated at 12 so as to avoid any possibility of the end of one tongue slipping through the aperture of the adjacent fin between the fin and the connecting bar.

The fins and connecting bars are assembled in a novel manner such that the tongues 11 in the final assembly are under stress and bear against the bar with sufficient force to hold the fin tightly at the desired angle. For this purpose, the tongues are bent only partially away from the fins in the initial punching operation as shown in Figs. 3 and 5. The fins are first mounted in a suitable fixture and held in the positions (see Fig. 3) which they are to occupy in the final assembly with the apertures of the adjacent fins in alinement. Then, the connecting bars are forced endwise through the apertures, the leading end of the bars being tapered as indicated at 13 to facilitate entry. As the bar end passes through an aperture after engaging the associated tongue 11, the latter is bent away from the fin from the position shown in Fig. 3 to the final position shown in Fig. 4 thereby bringing the bent-up tongue end 12 into abutment with the adjacent fin, the remainder of the tongue lying alongside the edge of the bar. By bending up the end, any possibility of the tongue entering

the aperture of one adjacent fin is effectually avoided.

As an incident to such bending, the metal of the tongue is so stressed internally that, due to its resiliency, the tongue exerts a frictional pressure and tends to tilt the fin relative to the bar into the limit angular position in which the bar engages the fin at three points **14**, **15**, and **16**. That is to say, the force exerted by each tongue tends to tilt the fin in a direction to reduce the magnitude of the acute angle which the plane of the fin makes with the face of the grille or the axis of the bar. Spacing of the point **16** away from the fin and near the free end of the tongue is effected by a slight bending of the tongues intermediate their ends as shown so that the intermediate portions do not bear against the bar **8**. Since each fin is frictionally held against sliding relative to the connecting bars and the adjacent fins are positively spaced by the tongues **11**, the final assembly is a substantially rigid structure no parts of which are apt to be displaced or distorted in service use. Looseness is thus effectually eliminated so that there will be no objectionable vibration of the parts as an incident to the flow of air through the grille.

Fig. 6 illustrates a modified form of the present invention having fins **17** which are bent into substantially right angular cross-sectional shape but rounded intermediate their side edges. Rectangular slots **18** are punched in the fins to receive connecting bars **19**. Instead of forming a single tongue as in the form first described, the punched out metal is severed intermediate the ends of the slot and bent back in the initial operation to form two tongues **20** integral with the fins at the opposite ends of the slot **18**.

As illustrated, the grille is assembled in the manner previously described by forcing the bars **19** endwise through the fin slots while the fins are held with the corresponding slots in alinement. As the end of the bar passes through a slot, the tongues **20** are spread apart and bent outwardly so as to lie alongside the edges of the bar. A four point bearing engagement is thus provided between the fins and the bars so that the former are held effectively against tilting relative to the bars. In the final assembly, the bent-up ends of the tongues on each fin abut against the adjacent fin, the two fins being thereby held positively in proper spaced relation.

I claim as my invention:

1. A grille core comprising a series of parallel sheet metal fins each having a narrow rectangular aperture punched therein with the longer dimension of the aperture extending transversely of the fin, a connecting bar of a thickness substantially equal to the width of said apertures extending through the alined apertures of said fins, and tongues formed from metal punched out of said apertures and integral with the fins at the narrow ends of the apertures, each of said tongues being of a width equal to that of the associated aperture and extending along a narrow edge of said bar and abutting at its free end against the adjacent fin.

2. A grille core comprising a series of sheet metal fins disposed in spaced parallel planes extending at an acute angle to the face of the grille, each fin having a punched aperture alined with the apertures of adjacent fins, a bar extending through said apertures and having a width less than but correlated with the lengths of the apertures so that the opposite defining ends of the apertures bear against opposite edges of said bar, and tongues each integral with one fin at the end of the aperture therein and extending along one edge of the bar with its free end contacting the adjacent fin whereby to hold the fins in spaced relation.

3. A grille core comprising a series of spaced sheet metal fins each extending at an acute angle to the face of the grille, each fin having a punched aperture alined with the apertures of adjacent fins, a bar extending through said fins and having a width less than but correlated with the lengths of said apertures so that the opposite defining ends of said apertures bear against opposite edges of said bar, and tongues each integral with one fin at the end of the aperture therein and extending along one edge of the bar with its free end contacting the adjacent fin, said tongues being internally stressed and exerting on the bar forces tending to swing said fins relative to the bar in a direction to reduce said acute angle.

4. A grille core comprising a series of spaced sheet metal fins, each fin having a punched aperture alined with the apertures of adjacent fins, a bar extending through said fins with its opposite edges bearing against the defining ends of said apertures, and tongues each integral with one fin at the end of the aperture therein and extending along the bar with its intermediate portion bent away from the bar and its free end contacting the adjacent fin and bearing laterally against the bar, each tongue being stressed to exert a force on said bar acting to swing the fin to and maintain the same in a limit position relative to the bar.

5. A grille core comprising a series of sheet metal fins of V-shaped cross section substantially throughout their lengths nested together in spaced parallel relation, each of said fins having a rectangular aperture formed therein across the tip of the V and alined with the apertures of adjacent fins, a connecting bar extending through the alined apertures of said fins, and tongues integral with each fin at opposite narrow ends of the aperture therein and extending along opposite edges of said bar and abutting at their free ends with the adjacent fin.

GEORGE FORREST DRAKE.