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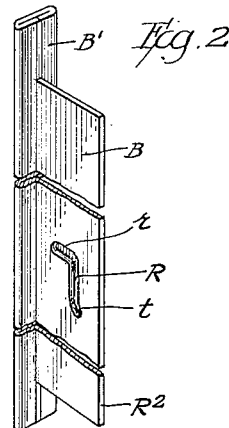
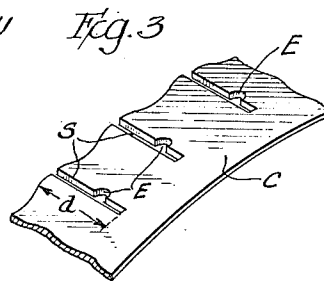
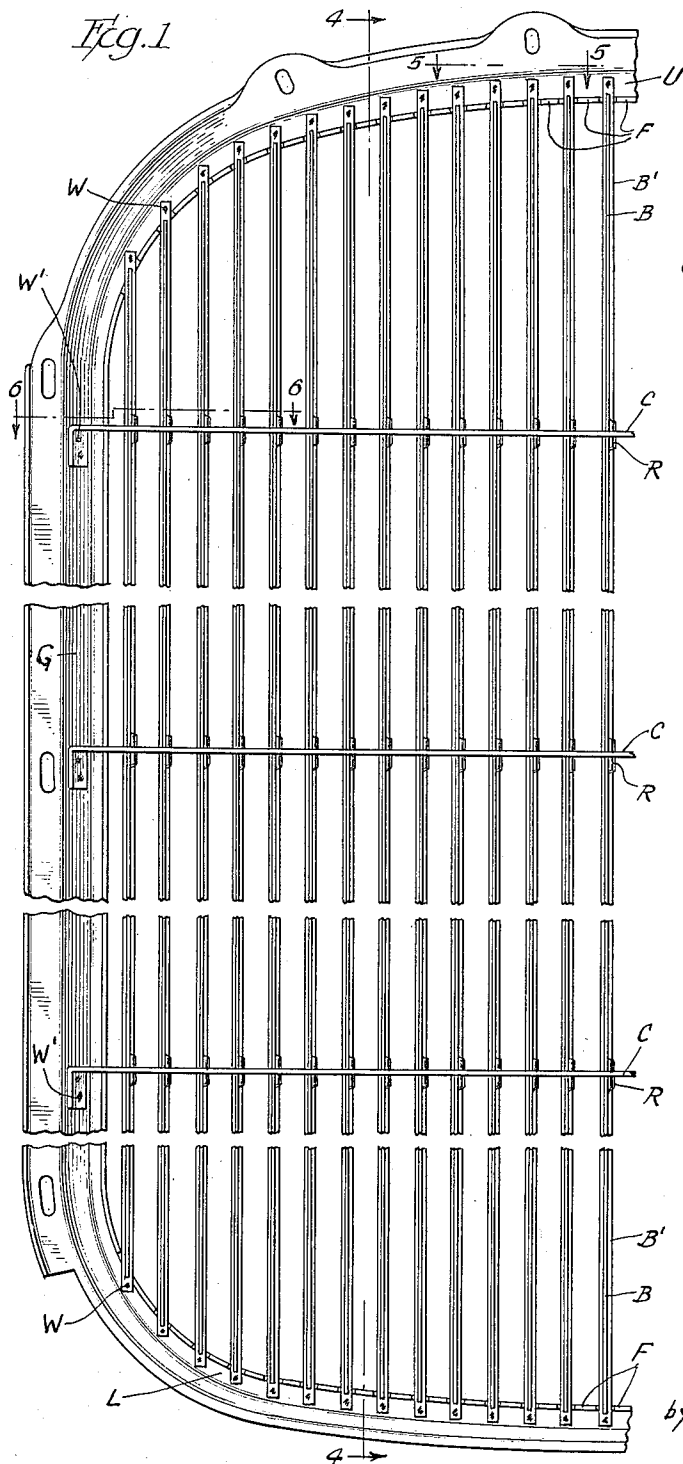
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2,089,935

RADIATOR GRILLE CONSTRUCTION

Filed June 5, 1937

2 Sheets-Sheet 1



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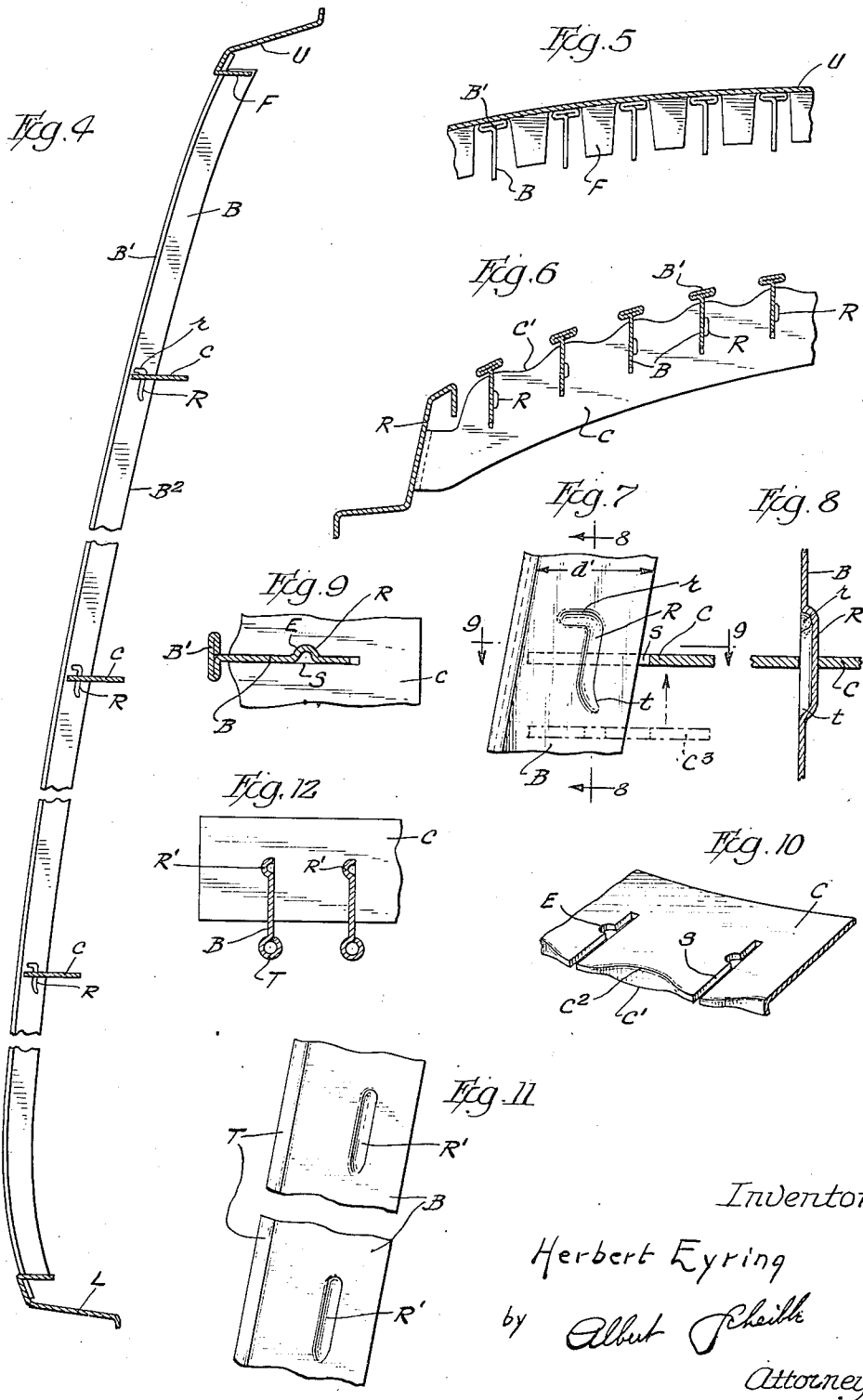
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RADIATOR GRILLE CONSTRUCTION

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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RADIATOR GRILLE CONSTRUCTION

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13 Claims. (Cl. 189—82)

My invention relates to a metal grille particularly suitable for guarding the air-admitting aperture in the front of the radiator-housing shell of an automobile, and to a grille of this class in which both the grille blades and the blade-connecting cross-bars are generally flat metal strips.

In such grilles it is already customary to have the blades extend generally parallel to each other and with their flat faces approximately at right angles to the general plane of the aperture spanned by the grille, to have the vertically spaced cross-bars present their flat faces approximately at right angles to the flat faces of the blades, and to space the blades consecutively from each other by having portions thereof extend through suitably spaced slots in the cross-bars. However, it is difficult in practice to have each such blade portion fit the corresponding slot sufficiently closely to prevent rattling, while still permitting a speedy assembling of the blades and cross-bars and also allowing for manufacturing variations in the thicknesses of the blades and in the width of the slots. Consequently, various auxiliary provisions have commonly been required for clamping each blade positively to the cross-bars, thereby undesirably increasing the manufacturing cost of the grilles.

So also, if the selected construction required the providing of slots in both the cross-bars and the blades, additional difficulties and expenses have been encountered in adapting such a construction to grilles shaped for affording variously shaped frontal surfaces, or for employing a given cross-bar and blade assembly for grilles in which the grille front as a whole slopes downwardly away from the general plane of the grille-guarded aperture to varying extents.

Moreover, additional difficulties have been encountered when a grille is to present the forward edges of its blades in a common forwardly convexed frontal surface, instead of a plane, so that each blade must dispose its forward and usually widened frontal portion in a surface which is correspondingly convexed.

In practice, it is already customary to form such a widened T-head or bead portion on the forward straight edge of a metal strip which is to form a blade, and thereafter to curve the resulting blade so as to present the forward face of its widened head portion in a surface which is convexed longitudinally of the blade.

However, with any suitable metal for such a blade, as for example a stainless steel, the resiliency of the metal will cause a thus curved blade

to spring more or less out of the curvature momentarily produced by the deforming or curving operation, to an extent which will vary both according to the particular curvature and with different batches of the same metal. So also, the variations or so called tolerances needed for economical manufacturing make it commercially impossible to obtain the exactness of curvatures which both in the blades and in the cross-bars for insuring the obtaining of the desired frontal surface convexing of the grille by a mere slidable assembling of the blades and cross-bars after the manner of assembling the relatively transverse members of the customary partitioning means in an egg carton or a candy box.

Furthermore, in a modern automobile the frontal grille is expected to reduce the visibility of the radiator core behind the grille, for which reason the frontal portions of the blades should be polished for effectively reflecting light so as to reduce the visual acuity of the observer and also to remove any finger marks left by the grille assembler. This polishing is usually effected by traversing the forward portions of the blades with buffing wheels moved longitudinally of the blades, and in practice portions of these wheels engage sharp forward edge portions of the cross-bars, thereby greatly reducing the life of these buffing wheels and increasing the cost of the buffing or polishing.

It is also customary, after blades and cross-bars have initially been assembled into an interlocking grid-like structure, to coat this preliminary assemblage with a black or otherwise colored coating material. This coating can then be buffed off the T-heads or bright frontal blade portions so that the exposed and polished stained steel of these front blade portions will be all the more conspicuous and eye-catching because of their contrast with the flat blade portions of the cross-bars. With the just recited procedure, it is likewise important that the buffing should not remove any material part of the coating on the parts of the cross-bars which extend between consecutive blades.

My present invention aims to obviate all of the above recited shortcomings of the heretofore proposed metal grilles of allied constructions by entirely eliminating the need of auxiliary means for clamping the blades firmly to the cross-bars, and by providing a blade and cross-bar assemblage which will permit the flat faces of each cross-bar to be disposed at varying angles to the frontal face of the grille without requiring

manufacturing changes in either the blades or the cross-bars. Furthermore, my invention aims to provide the just recited advantages while permitting both the blades and the cross-bars to be
 5 formed of quite thin metal strips, and while also facilitating the assembling of the entire grille so as to effect a further reduction in its manufacturing cost.

More particularly, my invention relates to a metal grille in which the blades and cross-bars are assembled (partially after the manner of the partitions in an egg carton) by having the flat portion of each blade extend successively
 10 through forwardly open slots in the several cross-bars, and aims to accomplish the following purposes:

(1) Providing a grille of this class in which the flat part of each blade has embossed portions, spaced substantially similarly to the spacing of the cross-bars; and in which each slot in a cross-bar has an enlargement through which
 20 such an embossed blade portion extends, so that these embossed portions determine the extent to which each blade projects forwardly beyond the cross-bars.

(2) Relatively forming the said embossed blade portions and the said slot enlargements, so that their interengagement will prevent a relative movement of the blades with respect to the cross-bars in directions parallel to the faces of the cross-bars, thereby insuring a rigid assembly even when the slots in the cross-bars are wider than the thickness of the blades.

(3) Forming the said embossed portions of the blades as embossed ridges extending longitudinally of the blades and spaced similarly to the spacing of the cross-bars, so that each blade can simultaneously be interlocked with all of the cross-bars by a longitudinally sliding of the
 35 blade.

(4) Having each such embossed ridges include main parts extending parallel to a longitudinal edge of the blade, and similarly directed portions diverging in the same direction from ends of the said main parts, for facilitating the assembling of each blade with the cross-bars (by a longitudinal sliding of the blade) regardless of considerable variations in the preformed blade curving from that required in the resulting assembling.
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(5) Providing a stop formation associated with at least one of the several embossed ridges of each blade, for limiting the longitudinal sliding of the blade during the assemblage of the blade with the previously suitably spaced cross-bars, so as to insure an adequate projecting (beyond the endmost cross-bars) of the blade end portions which are to be fastened to end members of the grille.

(6) Disposing the said main portions of the embossed ridges on each blade at such a spacing from the rear edge of each blade that the grille can readily be assembled without having the blade scrape on the bottoms of the slots through which the blade extends.
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(7) Disposing the said main ridge portions of each blade also at such a spacing from the head, or other widened frontal portion of the blade, that this frontal portion will not scrape off the forward edges of the cross-bars during the assembling.
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(8) Forming the cross-bars so that the portions of these bars which extend between consecutive blade-receiving slots have their forward edges bowed rearwardly to afford an increased

clearance to portions of a buffing wheel used in polishing the blade fronts, and curving similarly directed frontal edges of these bowed cross-bar portions to prevent injury to the buffing wheel and also to prevent having coating material
 5 brushed off these cross-bar portions during the buffing operation.

(9) To provide blades and cross-bars which can easily be assembled by simple sliding operations into a grid-like assemblage which can be freely handled as a unit and thereafter fastened to a grille frame or other apertured supporting member.
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Illustrative of the manner in which I accomplish the above and other objects of my invention,
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Fig. 1 is a rear elevation of approximately half of an automobile radiator grille embodying my invention, with the embossed formations on the blades exaggerated in size for clarity.

Fig. 2 is an enlarged and fragmentary perspective view of an end portion of one of the blades.

Fig. 3 is a similarly enlarged perspective view of a portion of one of the cross-bars.

Fig. 4 is a vertical section through the grille of Fig. 1, taken along the line 4—4 of that figure.
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Fig. 5 is an enlarged and fragmentary plan section taken along the line 5—5 of Fig. 1, showing the disposition of the blade ends with respect to adjacent parts of the upper frame member of the grille.
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Fig. 6 is a similarly enlarged and fragmentary plan section, taken along the line 6—6 of Fig. 1, showing the interlocking of the blades with a cross-bar.

Fig. 7 is an enlarged view showing two relative positions of a cross-bar with respect to the part of the blade with which that bar interlocks.

Fig. 8 is a section taken along the line 8—8 of Fig. 7.

Fig. 9 is a section taken along the line 9—9 of Fig. 8.
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Fig. 10 is an enlarged frontal perspective view of a part of one of the cross-bars.

Fig. 11 is a fragmentary side elevation of two cross-arm-engaging portions of a blade, showing a more simple form of the embossing, suitable for use with straight-edge blades.

Fig. 12 is a view, allied to Fig. 9, showing a different shaping of the frontal (or head-forming) blade portions and a different location of the embossed ridges from those pictured in previous figures.
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In the drawings, the rear view of Fig. 1 shows a part of a grille which includes a frame comprising riser members G connecting an upper frame member U with a lower frame member L. The same figure also shows my novel blade and cross-bar assembly as attached to this frame member by welds W which secure the end portions of the blades respectively to the said upper and lower frame members, and by welds W¹ which secure the turned-down ends of the cross-bars to the riser members R of the frame.

In constructing such a grille, I first provide blade strips of suitable lengths, each of which has a longitudinal edge part formed to afford a T-head B¹ (Fig. 6) for the blade, this head being done by a well-known rolling operation while the strips present straight free edges R² (Fig. 2). Then I bend each of the various strips longitudinally to correspond approximately to the appropriate curvature which the head front of that particular blade is to have in the completed grille. When this is done in any usual inexpensive manner, the blade usually springs somewhat out of
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the curvature to which it was momentarily formed by such a curving operation, so that the blade will thereafter resist an effort to return it to the desired curvature, and I later on employ this resistance as part of the means for insuring a firm interlocking of the blades with the cross-bars regardless of manufacturing variations.

Instead of providing both the blades and the cross-bars with transversely extending slots, after the manner used in egg carton partitions, I provide only the cross-bars C with slots S which usually are parallel to each other, but form no slots whatever in the blades. Each of the cross-bar slots is preferably of a depth d (Fig. 3) shorter than the width d^1 (Fig. 8) of the flat blade part B behind the T-head of the blade, and each slot is of ample width so that such a flat blade part can readily be inserted into the slot and also slid (lengthwise of the blade) with respect to the cross-bar.

As means for interlocking the blades with the cross-bars, I provide each cross-bar slot with a lateral enlargement E (Fig. 3), desirably intermediate of the depth of the slot, and emboss each blade with formations adapted to enter and substantially fit these enlargements in the several cross-bars C, these formations on each blade being spaced similarly to the spacing of the cross-bars.

In its simplest form, each such embossed formation may be a mere straight ridge R^1 (Fig. 11) parallel to the longitudinal edges of the blade, and in the preferred form of Figs. 2 and 7 each embossing includes a similarly disposed main portion R. However, to facilitate a speedy attaching of each blade to all of the cross-bars (when these latter are temporarily held in the desired definitely spaced parallel relation by a suitable jig, in a manner well known to the art) I preferably also have these embossings include guide portions t (Fig. 7). These guide portions all extend toward the same end of the blade and diverge at an oblique angle from the main portions R of the embossings. Each such guide portion preferably has its free end reduced both in width and in height, as also shown in Fig. 7, thereby providing a tapering tip which will easily enter the slot enlargement E in the cross-arm for guiding the main embossed ridge part R into that enlargement.

With the blades and cross-bars thus constructed, and the cross-bars held in a jig, each blade can readily have its flat part B inserted into the slots of all the cross-bars while each embossing of the blade is near but spaced from the adjacent cross-bar (such as C^3 in Fig. 7). By then pressing longitudinally spaced parts of the blade more or less toward the cross-bars, the blade then can readily be flexed digitally so as to have the tail tips of the several embossings simultaneously enter the slot enlargements E in the several cross-bars, and the assembler then can instantly slide the blade longitudinally so that the main part R of each embossing extends through a cross-arm, as shown in Figs. 1 and 8.

However, if no means were provided for limiting the extent of this sliding, part or all of the blades might easily be slid to such an extent that one blade end would not adequately overlap a part of the adjacent end member of the grille frame, while the other end might be too long in proportion to the width of the part of the other frame-end member to which that end is to be fastened. To avoid this difficulty, I preferably also provide a stop formation adjacent to the end of

at least one of the aforesaid embossed formations, namely the end opposite that from which the guide portion t extends.

For this purpose, Fig. 7 shows the main embossed ridge portion R as continued by a stop portion r extending transversely of the blade. In practice, a stop portion adjacent to a single one of the several main portions R on the blade would suffice, but these may be adjacent to each such main portion (as shown in Fig. 1) so that a single punch and die will suffice for consecutively forming the entire embossings on the blade.

With the interlocking arrangements thus provided, the length of each main ridge portion automatically compensates for manufacturing variations in the spacings between the consecutive cross-bars, or in the exactness of curving of the blades, as shown for example in Fig. 1 where only the uppermost embossed stop portion r engages the adjacent cross-bar. Moreover, owing to resiliency of the blades, I have found that a speedy attaching of these to the cross-bars in the above recited manner will effect a so firm an assembling that the resulting grid-like structure can readily be handled as a substantially rigid unit while thereafter positioning it in the frame of the grille.

So also, even if the embossed ridge portions do not snugly fit the slot enlargements through which they extend, the previously mentioned effect of the resiliency of the blades will still effect this rigidity, so that the flat blade part need not correspond closely in thickness to the width of the slots. Consequently, I can readily employ blades of as small a thickness as one-sixtieth of an inch, a thickness for which a snugly fitting slot cannot readily be sawed in the much thicker metal which is required for each cross-bar to give the latter an adequate strength and rigidity.

To avoid a rapid deterioration of a buffing wheel used for polishing the T-head fronts of the blades (or removing a previously made coating on these T-heads) and also to avoid having the buffing wheel scrape such a coating off the forward cross-arm edge portions which extend between consecutive slots, I bow these edge portions rearwardly (as shown at C^1 in Fig. 6) and also preferably curve the bowed portions downwardly as shown in Fig. 10. By so doing, I cause the said bowing to afford more clearance for a buffing wheel which has its fibres moving downwardly along a blade head, while the rounded edge C^2 also allows such fibres to slide over it without cutting the fibres or scraping coating material off that edge.

To facilitate the proper spacing of the T-heads of the blades, which heads B^1 extend beyond each end of the flat blade part B as shown in Fig. 2, I desirably also provide each end member (U or L) with rearwardly extending fingers F, spaced so that a T-head can readily be inserted between each two consecutive fingers as shown in Fig. 5.

However, while I have heretofore described my invention in connection with an embodiment in which the grille front has both ends rearwardly convexed, and in which particular desirable details are included, changes may obviously be made without departing either from the spirit of my invention or from the appended claims. For example, Fig. 12 shows the embossed main ridge portion as adjacent to the rear edge of each blade, and the corresponding slot enlargement adjacent to the rear end of each slot. So also, the same figure shows the widened front portion of each blade as a bead or tube T.

I claim as my invention:

1. A metal grille including an assemblage of spaced and parallel cross-bars with spaced and parallel blades extending transversely of the cross-bars, the several cross-bars having relatively alined sets of slots extending rearwardly into them, and the said slots being provided with counterpart and similarly directed lateral enlargements; each blade including a flat main part extending consecutively through and slidably fitting alined slots in the several cross-bars; the said main blade part also having alined ridges, of relatively short length in proportion to the spacings between the cross-bars, extending through the enlargements of the slots through which that blade part extends, the said ridges substantially fitting the said enlargements so as to anchor the blade to the cross-bar.

2. A metal grille as per claim 1, in which the said ridges on each blade have similarly directed end portions of less height and spread than the remaining portions of the said ridges, to facilitate the entry of the ridges into the said slot enlargements by a longitudinal sliding of the blades, with respect to the cross-bars, in the direction in which the said ridge end portions face.

3. A metal grille as per claim 1, in which the said ridges on each blade have similarly directed end portions of less height and spread than the remaining portions of the said ridges, to facilitate the entry of the ridges into the said slot enlargements by a longitudinal sliding of the blades, with respect to the cross-bars, in the direction in which the said ridge end portions face; each blade also including a stop formation adjacent to the opposite end of one of the ridges, for limiting the sliding of the blade in the said direction with respect to the cross-bars.

4. A metal grille as per claim 1, in which each blade also includes a frontal head portion of considerably greater width than the said flat main portion of the blade, the said blade head portion being spaced from the ridges on the blades by a distance greater than the distance between the mouth end of one of the said cross-bar slots and the enlargement of that slot, whereby the extending of the said ridges through the said slot enlargements causes the blade to have its said head portion spaced forwardly from the cross-bars.

5. A metal grille as per claim 1, in which each slot enlargement is of a semi-circular section, and in which the part of each ridge which extends through such a slot enlargement is of a semi-tubular section having its exterior radius corresponding substantially to the arcuate portion of the said semi-circular section.

6. A metal grille of the class in which generally flat, spaced and substantially parallel blades have their ends fastened respectively to the two end members of a frame, in which spaced cross-bars have their ends fastened respectively to the two side members of the frame, in which the several cross-bars have slots of counterpart spacing extending rearwardly into them, and in which each blade has rearward parts thereof extending consecutively through a slot in each cross-bar; each of the said slots having a lateral enlargement, and each blade having ridges extending longitudinally of the blade and respectively through and substantially fitting the said enlargements in the slots through which rearward portions of that blade extends; the said ridges being relatively short with respect to the spacings between the cross-bars so that the said ridges on the blade can be simultaneously slid through the said enlargements of slots in the

several cross-bars by sliding the blade longitudinally after the blade has had rearward portions thereof; spaced in the same direction longitudinally of the blade from the said ridges, inserted in the said slots.

7. A metal grille as per claim 6, in which each blade also has a stop formation disposed for engaging one of the several cross-bars to limit the said longitudinal sliding of the blade with respect to the cross-bar.

8. A metal grille as per claim 6, in which each ridge on a blade has its main portion extending substantially parallel to a longitudinal edge of the blade; and in which each ridge also includes a guide portion extending toward an edge of the blade from the end of the said main portion which faces in the direction of the said sliding of the blade, the said main and guide portions having their axes at oblique angles to each other.

9. A metal grille as per claim 6, in which the end of each ridge which faces the adjacent cross-bar is of less height and spread than the said main portion of the ridge.

10. A metal grille as per claim 6, in which each ridge on a blade has its main portion extending substantially parallel to a longitudinal edge of the blade; and in which each ridge also includes a stop portion extending transversely of the blade from the end of the blade opposite to the end which faces in the direction of the said sliding of the blade.

11. A metal grille of the class in which generally flat, spaced and substantially parallel blades have their ends fastened respectively to the two end members of a frame, in which spaced cross-bars have their ends fastened respectively to the two side members of the frame, in which the several cross-bars have slots of counterpart spacing extending rearwardly into them, and in which each blade has rearward portions thereof extending consecutively through a slot in each cross-bar; each blade having frontal portion extending forwardly of the cross-bars and of considerably greater width than the blade parts extending through the said slots, the portions of the forward edge of each cross-bar which extend between the consecutive slots in that bar being bowed rearwardly to prevent a material engagement of the said edge portions with a buffing wheel during the polishing of the said widened frontal portion of the blade.

12. A metal grille as per claim 11, in which the said rearwardly bowed edge portions of the cross-bar are bent downwardly so as to present a curved upper forward edge to parts of a buffing wheel which traverses the face of the said frontal blade portion in a downward direction.

13. A substantially upright grille comprising: a frame including top, bottom and side members; vertically spaced cross-bars extending transversely of the frame and fastened at their ends respectively to the two side members of the frame, the said cross-bars having relatively alined sets of slots extending rearwardly into them and having each slot provided with a lateral enlargement; and blades each fastened at its ends respectively to the top and bottom frame member, each blade including a general flat rearward part extending consecutively through and slidably fitting alined slots in the several cross-bars; each rearward blade part adjacent to each cross-bar having an embossed anchoring ridge extending substantially parallel to the forward edge of the blade, and extending through the slot enlargement in the said adjacent cross-bar; each such

ridge being equally spaced from the forward edge of the blade and each slot enlargement being similarly spaced from the forward edge of the cross-bar, so that the several ridges on each blade
5 can be slidably inserted in the slot enlargements of the several cross-bars by a longitudinal sliding

of the blade, after the inserting into the slots of the several cross-bars of the rearward portions of the blade which are similarly spaced longitudinally of the blade from the ridges on that blade.

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