Sept. 22, 1936. L. B. GREEN 2,055,010

GRILLE BLADE AND END BAR ASSEMBLY

Filed July 16, 1934

Fig. 1

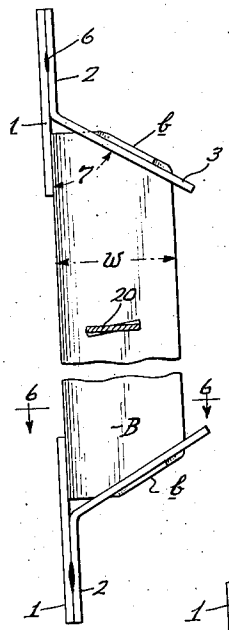


Fig. 2

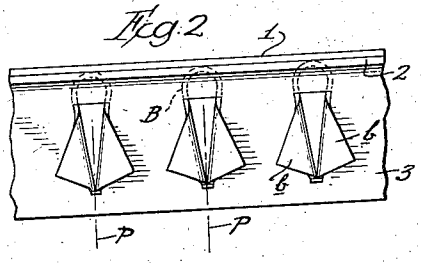


Fig. 3

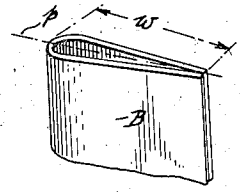


Fig. 4

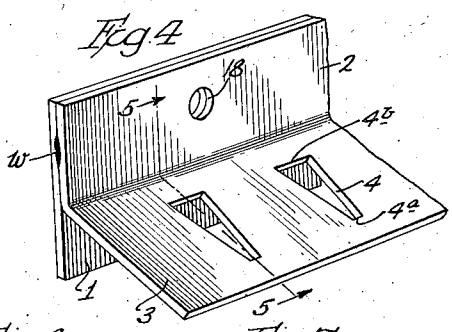


Fig. 5

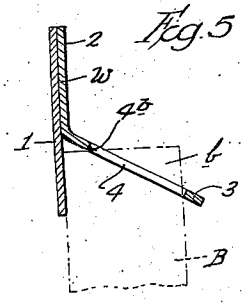


Fig. 6

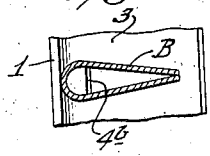


Fig. 7

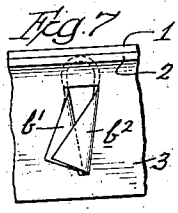


Fig. 8

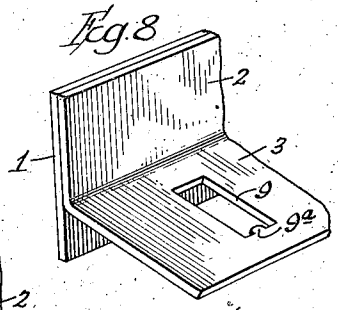


Fig. 12

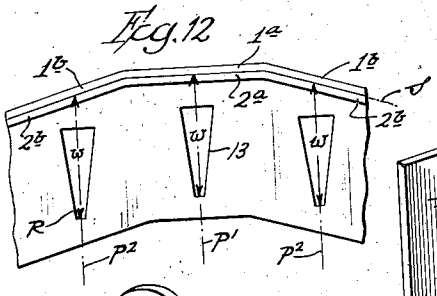


Fig. 10

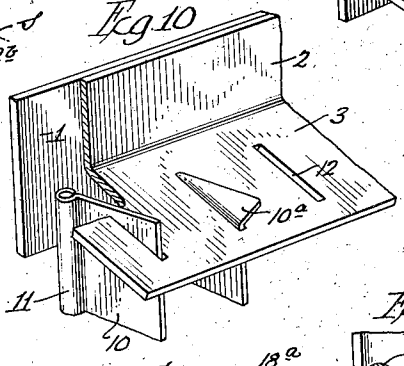


Fig. 9

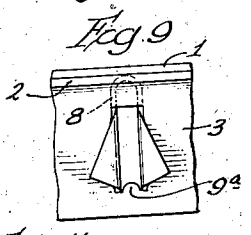


Fig. 13

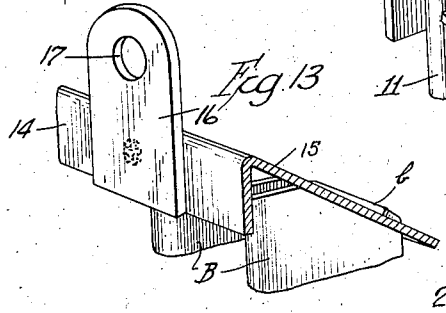


Fig. 11

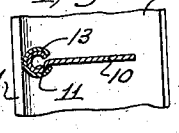
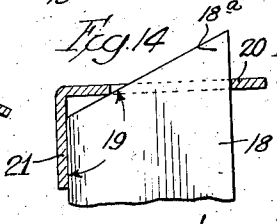


Fig. 14



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Attorney

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2,055,010

UNITED STATES PATENT OFFICE

2,055,010

GRILLE-BLADE AND END-BAR ASSEMBLY

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Application July 16, 1934, Serial No. 735,000

15 Claims. (Cl. 189—82)

My invention relates to metal grilles (such as frontal grilles for automobile radiator shells) of the class in which parallel blades have their flat faces coparallel, and in which the opposite ends of the blades are secured to end members which rigidly space the blades and by which end members the blades also may be supported to the apertured front member with which the grille is to be used.

In general, the objects of my invention are those of providing a grille of this class in which the blades can speedily and securely be anchored to the end members of the grille without requiring either welding operations or auxiliary fastening elements; in which no special formations on the blades need to be provided to effect their fastening to the end members; in which the mere bending of end parts of each blade against oppositely directed faces of the two end members will cooperate with the shaping of these end members to effect a rigid assembling of the blades and the end members; and in which the end member can be cheaply formed from metal strips.

Moreover, my invention provides a novel end member for a parallel-bladed grille which can be adapted with equal facility to U-sectioned blades, single-web blades provided with either integral or attached frontal beads, or so-called "tear drop" blades. This term "tear drop" blade is now used by the trade to designate a blade which is formed from a sheet metal strip by curvedly folding the strip about its medial longitudinal line, after the manner of forming a U-sectioned blade presenting parallel blade webs, and extending this forming operation until the free edges of the two blade webs contact with each other so that the said webs converge rearwardly when the blade has its convexed end facing forward in the grille.

Illustrative of the manner in which I attain the above recited objects,

Fig. 1 is a fragmentary side elevation of a grille embodying my invention and including blades of a "tear drop" section.

Fig. 2 is a fragmentary plan view of the same.

Fig. 3 is an enlarged perspective view of the upper end of one of the blades before it is attached to the upper end member.

Fig. 4 is a perspective view of a part of the upper end member alone.

Fig. 5 is a vertical section taken along the line 5—5 of Fig. 4, with dotted lines showing the upper portion of a blade before an upper end portion of each web of the blade is bent down against the sloping flange of the end member.

Fig. 6 is a plan section taken along the line 6—6 of Fig. 1.

Fig. 7 is a plan view allied to a part of Fig. 4 but showing the blade-end anchoring as effected by bending portions of both webs of the blade in the same direction.

Fig. 8 is a fragmentary perspective view of an upper end member suitable for use with a parallel-web U-sectioned blade.

Fig. 9 is a plan view of the part of an upper end member shown in Fig. 8 after a U-sectioned blade has been anchored to it.

Fig. 10 is a perspective view of a part of an upper end member designed for use with a single-web blade presenting a tubular bead at its front, including the upper end portions of an already anchored and of a not yet anchored blade.

Fig. 11 is a section allied to Fig. 6 but showing a blade of the same type as in Fig. 10, with a frontal ornamenting tube attached to frontal bead on the blade.

Fig. 12 is a fragmentary plan view of the central portion of an end member, allied to Fig. 4 but designed for use with "tear drop" blades disposed so as to give a V-front effect to the grille.

Fig. 13 is a perspective view of an upper portion of a grille allied to that of Figs. 1 and 2, but showing a different construction of the end member.

Fig. 14 is a transverse section through an upper end member in which the slotted web extends rearwardly at right angles to the frontal web, including an elevation of a portion of blade which has its end cut off at a suitable cooperating angle, showing this blade portion as it appears before the tip of this blade end is turned down.

In constructing an upright-bladed grille after the here illustrated manner, I provide two counterpart, but relatively inverted end members, as shown in Fig. 1 for a flat-fronted grille having upright blades of equal length and having its end members horizontal. In Figs. 1, 4 and 5 each upper end member includes a rigid frontal strip 1 which has its flat faces upright, and an also rigid rearward strip comprising an upper web 2 secured flatwise to the upper part of the rear face of the said frontal strip 1 (as for example by welds 6), and which has its lower portion 3 slope downward rearwardly at an acute angle to the rearward face of the said frontal strip.

This sloping rear web 3 is provided with spaced slots 4 each shaped for slidably fitting the major rearward portion of one blade of the grille, the

medial longitudinal planes P of these slots (Fig. 2) being at right angles to the flat faces of the front strip 1 and spaced to correspond to the desired spacing of the medial planes of the consecutive tear drop blades (shown in dotted lines at B in Fig. 2) of the proposed grille. Each of the slots 4 is so positioned that the lower edge of its rearward end 4*a* (Fig. 4) is spaced rearwardly from the front strip of the end member by a distance corresponding to the "over all" width *w* of a blade. With the slots thus arranged, each upper end of a blade can readily be slid upward partly through one of the said slots and with the forward edge of the blade engaging the rear face of the lower part of the frontal strip 1 to the position shown in dotted lines in Fig. 5; namely until the rear portion of the square-cut upper end of the blade projects beyond the top of the sloping web 3 and the upper end of the blade abuts against the lower edge of the forward end 4*b* of the slot.

After the upper blade portion is thus positioned, so that each web of the blade has a triangular portion *b* projecting above the said sloping web 3 of the upper end member, I forcibly bend these two triangular blade-web portions away from each other and downwardly against the said sloping web 3, as shown in Figs. 1 and 2. This clinching of the said triangular web portions *b* draws the blade upward tightly against the lower edge of the forward end 4*b* of the slot through which the blade partly extends. The frontal strip 1 then bears for a considerable vertical distance against the front edge of the blade, the rear blade edge bears rearwardly against the lower edge of the rear end 4*a* of the slot, and the longitudinal side walls of the slot bear respectively against the outer faces of the portions of the two blade webs which are disposed within the slot.

In practice, the acute angle 7 (Fig. 1) between the sloping web and the part of the frontal strip 1 which faces this web can be varied, even for the same width of blade, by suitably altering the clear spacing of the rear ends of each slot from the said strip. However, I preferably construct and dispose each slot so that at least three-quarters of the width of a blade will extend through it, and make the said angle 7 (Fig. 1) not over 60 degrees. Moreover, instead of bending the two triangular web end portions in relatively opposite directions, these might both be bent toward the same side of the blade in overlapping relation to each other, as shown by the superposed blade web portions b^1 and b^2 in Fig. 7.

If the blades of the grille are to be of the now customary parallel-webbed U-section, such as the blade 8, as shown in dotted lines in Fig. 9, each slot 9 would have parallel longer side walls. In that case, the rear end wall of the slot may be provided with a reentrant nub 9*a* as shown in Figs. 8 and 9, so as to positively hold the rearmost portions of the slot-housed blade webs spread apart, although I have not found this necessary with blades of the now customary rigidity of metal.

Moreover, both the frontal contour of the end members and the angles at which the medial longitudinal planes P of the slots extend with respect to the adjacent portions of the frontal strips 1 of the end members may be varied according to the frontal appearance desired for the grille. For example, if a "tear drop" blade grille is to present a V-front or other non-planular front, each end member may have its frontal strip bent so that the rear face of this strip corresponds to the shape of the proposed frontal surface *s* of the grille. Thus, Fig. 12 shows the central portion of an upper end member for a V-front grille as comprising a front strip which has two portions 1*b* diverging rearwardly from opposite ends of a central portion 1*a*, and in which the upper web 2*a* of the rearward strip is similarly bent so that these are adjoined in the proposed frontal surface of the grille.

Then the medial planes between the webs of the several blades can be kept co-parallel by disposing the central slot 13 so that its longitudinal medial plane P^1 is at right angles to the upright faces of the adjacent portions of the strips 1 and 2, while other slots 14 would have their longitudinal medial planes P^2 parallel to the aforesaid plane P^1 and hence oblique to the adjacent strip portion 2*b*, all slots being disposed with their rear ends R at the same distance *w* from the rear face of the front strip 1 when this distance is measured in the said medial planes of the slots.

Moreover, the construction of my novel end members may also be varied otherwise, it being merely essential (when the blades are cut off squarely) that each end member presents a face portion in rearward engagement with front edge portions of the blades, and that each end member includes a slotted web which slopes rearwardly (with respect to the said face portion) at an acute angle opening toward the midlength of the blades.

For example, Fig. 13 shows a portion of an upper end member having as its main member a single strip of metal, formed to an angle section presenting an upright frontal web 14 against which the blades B bear forwardly, and a companion web 15 which slopes downward rearwardly and which is slotted after the heretofore described manner so as to have upper end portions *b* of the blade webs down against its upper face.

With the construction shown in Fig. 13, anchoring lugs 16 may be welded to the frontal web 14 so that the end member can readily be supported by bolts extending through perforations 17 in such lugs; while with the end member construction of the previously described figures such supporting bolts can extend through alined perforations 18 in the overlapping portions of the frontal strip 1 and the upper web 2 of the rear strip.

In the heretofore described embodiments, the end members were designed for use with blades which are cut to present their end edges at right angles to their longitudinal edges, thereby avoiding a waste of metal when cutting the blades from previously formed long folded strip. But the blades may also have other than square-cut ends if the angle 7 in Fig. 1 is correspondingly varied so that the blade ends, when slid partly through slots in the rearwardly extending web of an end member, have their webs projecting only for part of the width of these webs beyond the said web. For example, Fig. 14 shows a cross-section through an upper end member in which the slotted web 20 extends at right angles to the frontal blade-engaging web 21, and in which the blade 18 has its end cut off at a rearwardly opening obtuse angle 19 to the forward edge of the blade.

Thus shaped, each blade when halted in its upward sliding through a slot (as here shown) exposes a rearwardly widening portion 18*a* above the said slotted web and adapted to be clinched down against the latter. In other words, my expeditious arrangement for anchoring blades to

end members depends mainly on having slots of shorter length than the width of the blades, on spacing these slots rearwardly from blade-front engaging parts of the end member, and on having each blade end cut off at a rearwardly open angle larger than the angle between the slotted web and the part of the frontal member which is in front of the slotted web.

However, while I have heretofore described my novel end members as used in connection with double-webbed blades, such end members can also be employed equally well with single webbed blades. For example, Fig. 10 shows portions of an upper part of a grille in which each blade **10** consists of a flat strip having its forward edge portion curled into a tube or ornamenting bead **11**, and in which the anchoring part of the blade end is a single triangular portion **10***a*. For such a blade, each slot **12** would be of a simple rectangular shape, as also when a similar blade has a separately constructed (longitudinally slitted) ornamenting tube **13** attached to its frontal bead *a* shown in Fig. 11.

Moreover, when the slots in an end member are suitably positioned, all blades for the grille can be cross-connected in any customary manner, as for example by tie-bars **20** of which one is shown in Fig. 1, and each end bar can then be slid simultaneously over the corresponding ends of all of the blades.

Other changes also might be made without departing either from the spirit of my invention or from the appended claims, so that I do not wish to be limited to the illustrative details of construction and arrangement heretofore described.

I claim as my invention:

1. A grille comprising generally flat and coparallel blades presenting their similarly directed ends at a uniform angle to their forward edges, and spaced end members extending transversely of the flat faces of the blades; each end member including a flat web having the surface of its outward face intersecting the said blade ends at an acute angle to their end faces, and having parallel slots extending transversely of an imaginary surface tangential to the forward edges of the blades, through each of which slots a blade end extends only for a part of its width; the said web having portions of its inward face adjacent to the forward ends of the slots respectively engaging the ends of the several blades, the part of the end portion of each blade which projects beyond a slotted web being bent into flatwise engagement with the outward face of the last named web.

2. A grille as per claim 1, in which each blade has its rearward edge engaging the rear edge of the slot through which a part of that blade extends.

3. A grille as per claim 1, in which each slot is of such shape that portions of the two side walls thereof engage opposite sides of the blade which extends partly through that slot.

4. A grille as per claim 1, in which each end member also includes a portion spaced forwardly from the rear end of each slot by a distance corresponding to the width of a blade, the said portion engaging the forward edges of the several blades.

5. An upright grille comprising upright, parallel and generally flat blades presenting their forward edges in a common surface, the blades being of uniform cross-section and having their adjacent ends cut off at a right angle to their forward edges; and end members each comprising a frontal web having its rear face conforming to the said common surface, and a second web extending rearwardly from the upper end of the latter and at a downwardly open acute angle to the rear face of the frontal web; the said second web having counterpart transverse slots, spaced longitudinally of the frontal web and of such a length that the difference between the spacings of the two ends of each slot from the said frontal web is shorter than the width of a blade, the rear end of each slot having its minimum spacing from the rear face of the frontal web corresponding to the width of a blade, each blade having each end thereof abutting intermediate its width against the inward edge of the forward end of one of the slots and having the more rearward part of its end portion extending through the same slot and bearing against the outward face of the web having that slot.

6. A grille as per claim 5, in which each slot in each end member has its forward end spaced from the rear face of the frontal web, by a distance not exceeding approximately one-third the width of a blade.

7. A grille as per claim 5, in which the said acute angle is between approximately 50 and 60 degrees.

8. A grille as per claim 5, in which the bore of each slot corresponds in shape substantially to the cross-sectional shape of the part of a blade which extends forwardly from the rear edge of the blade for a distance approximating the length of a slot.

9. A grille as per claim 5, in which each slot has the rearward portion of its bore of a cross-section corresponding in cross-section to the exterior cross-section of a rearward part of a blade.

10. In a grille, an upper end member comprising a frontal web and a slotted web fast with respect to the frontal web and extending rearwardly from the upper end of the frontal web, the slotted web having spaced transverse slots; and blades each having its front edge engaging a rear face of the frontal web below the slotted web, and each having a rearward blade-end portion extending through one of the slots; each slot having its rear end engaging the rear edge of the blade of which a portion extends through that slot, and having the lower edge of the forward end of the slot engaging the end of the blade intermediate of the width of that end; the portion of each blade end which extends beyond a slot extending at an angle to the general direction of the blade and engaging the adjacent face of the slotted web of the end member to cooperate with the said engagement of the blade end with the lower edge of the forward end of the slot in clamping the blade to the end member.

11. A grille comprising parallel blades of uniform width and which blades have their adjacent ends cut off at a uniform angle to their forward edges; and an end member including a frontal web extending in front of and contiguous to an end portion of the forward edge of each blade, and also including a slotted web extending rearwardly from the forward web and provided with slots through which the rearward portions of similarly directed ends of the blades respectively extend, the slotted web presenting its outward face at a rearwardly open acute angle to the adjacent end of each blade; each blade having a portion of its rear edge and a portion of its end respectively engaging edges of the rear and forward ends of a slot; each blade end part which extends beyond a slot bearing flatwise against the outward face of the slotted web.

12. A grille including double-webbed upright blades of counterpart cross-section, the said blades having their similarly directed ends cut off at a uniform angle to their forward edges; and an end member comprising a front web bearing against end portions of the forward edges of the blades, and a second web extending rearwardly from a part of the frontal web which is spaced freely from the free ends of the said forward blade edges, the said second web presenting its outward face in a surface intersecting the ends of the blades at an acute angle to the latter; the said second web having spaced transverse slots each of which has its rear end spaced from the rear face of the frontal member by a distance corresponding to the width of a blade; each blade having rear portions of both of its blade webs extending through a slot, and having the web parts which are disposed beyond the said second web diverging from each other and respectively engaging the outward face of the said second web of the end member at opposite sides of the slot.

13. A grille comprising co-parallel blades presenting their forward edges in a common upright surface and their similarly directed ends at uniform angle to their forward edges; and an end member including in rigid formation a frontal web bearing rearwardly against the said forward edges of the blades adjacent to the similarly directed ends of the blades; and a rearward web extending rearwardly from the said frontal web and having its upper face in a plane intersecting the said ends of the blades at an acute and rearwardly open angle; the said rearward web being provided with slots through which the rearward portions of the said blades respectively extend, and against the side walls of which slots the said blades fit; each slot having its rear end engaging a rear edge of one blade and having the inward edge of its forward end engaging an end portion of that blade; the portions of the blade ends which project beyond the slots being in flatwise engagement with the outward face of the said rearward web of the end member.

14. A grille as per claim 12, in which the two blade-web parts housed by each slot bear respectively against the two side walls of the slot.

15. An upright grille comprising upright, square-ended and generally flat blades having the medial planes between their side-faces co-parallel, and two end members each comprising a frontal metal strip presenting its rearward face upright and its longitudinal edges generally horizontal; each end member also including a second metal strip having its upper part disposed behind and secured flatwise to the upper part of the said frontal strip, the said second strip having its lower part extending rearwardly at an acute angle to the lower part of the said frontal strip; the said reawardly extending strip portions of the second strip of each end member being provided with spaced transverse slots, each slot having the rearward portion of its bore corresponding substantially in section to that of the rearward portion of the blade and each slot having its rear edge horizontally spaced from the lower portion of the frontal strip by a distance corresponding to the width of a blade; each blade having its forward edges bearing forwardly against the frontal strips of both end members, and having only the rearward major portion of each end of the blade extending through and projecting beyond one of the slots, each projecting blade end portion bearing flatwise against the outward face of the slotted strip of the adjacent end member.

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