United States Patent [19]

Martin

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[54] **DECORATIVE GRILL JOINT**

[75] Inventor: **Robert I. Martin,** Manheim, Pa.

[73] Assignee: **Rimar Manufacturing Inc.,** Manheim, Pa.

[22] Filed: **Dec. 9, 1971**

[21] Appl. No.: **206,531**

Related U.S. Application Data

[63] Continuation of Ser. No. 885,095, Dec. 15, 1969, abandoned.

[52] **U.S. Cl.**.....**52/758 H,** 52/456, 52/753 D

[51] **Int. Cl.**..... **E04b 1/48**

[58] **Field of Search**287/20.92 D, 20.92 E, 20.92 A, 287/20.92 B, 126, 189.36 H; 52/311, 455, 456, 507, 656

[56] **References Cited**

UNITED STATES PATENTS

2,342,537	2/1944	Geisler	287/189.36 H
3,092,406	6/1963	Wasserstrom	287/126
3,307,316	3/1967	Gray	287/189.36 H
3,340,661	9/1967	Krieger	52/456
3,484,126	12/1969	Hook	287/189.36 H
3,645,058	2/1972	Jacobson	52/456

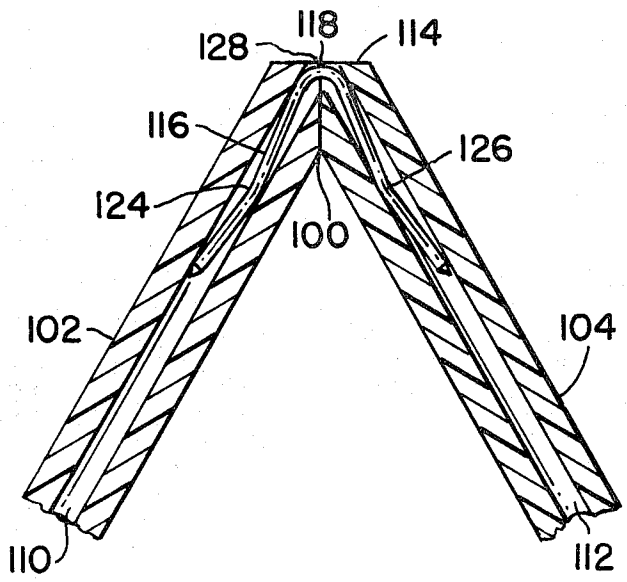
Primary Examiner—Alfred C. Perham

Attorney, Agent, or Firm—Karl L. Spivak

[57] **ABSTRACT**

A decorative window grill construction employing a plurality of interconnected, elongated grill bars of flattened construction to insert within the insulating space of an insulated window assembly and including connecting pins affixed at the free ends of the grill bars for insertion into undersized holes provided in the periphery of the insulated glass construction. The grill bars insert within axially aligned bores and distort portions of the internal grill bar construction. Grill bars forming diamond shaped configurations and having axially aligned central bores abut in angular relation by means of undersized bent pins which insert within the bores and restrict therein at the bent portions.

1 Claim, 9 Drawing Figures



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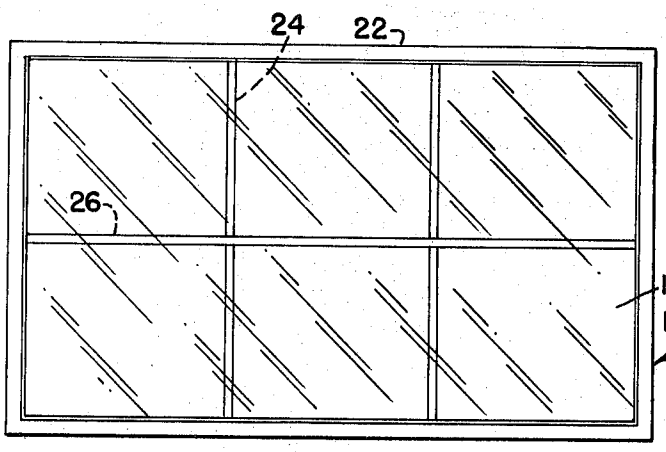


Fig. 1

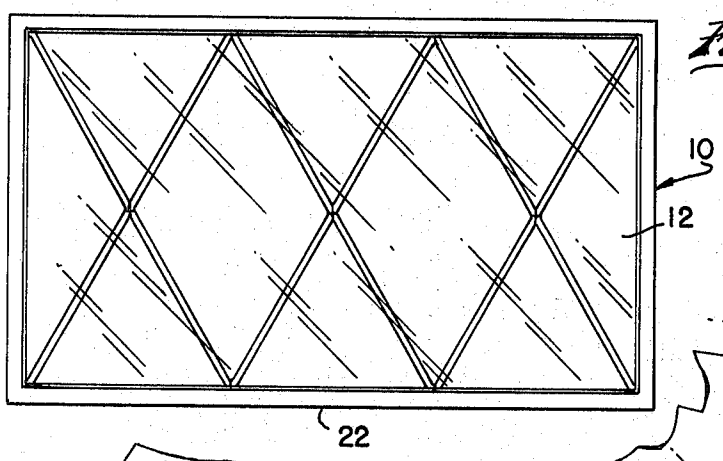


Fig. 2

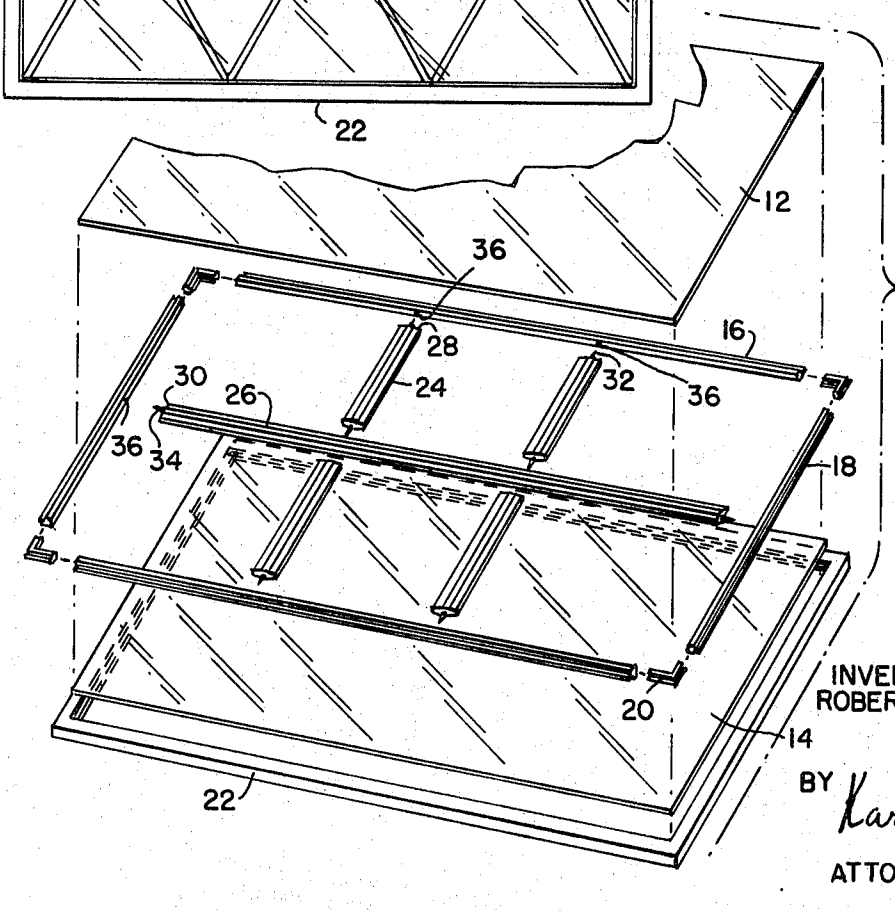


Fig. 3

INVENTOR
ROBERT I. MARTIN

BY Karl h. Spivak

ATTORNEY

Fig. 4

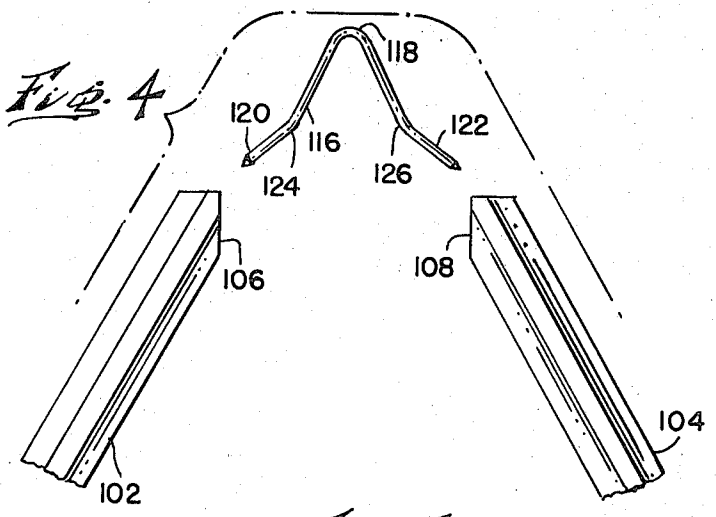


Fig. 5

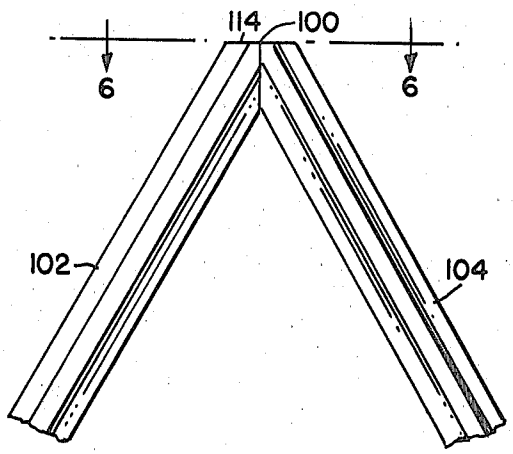
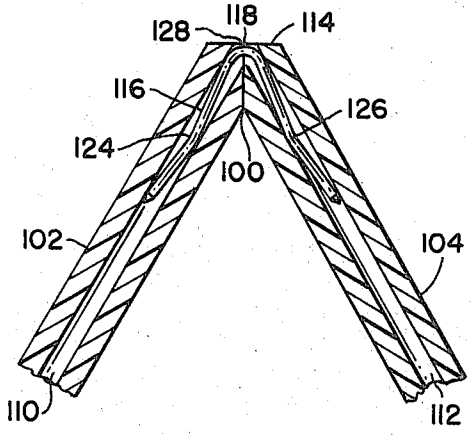


Fig. 6



INVENTOR
ROBERT I. MARTIN

BY Karl L. Spivak

ATTORNEY

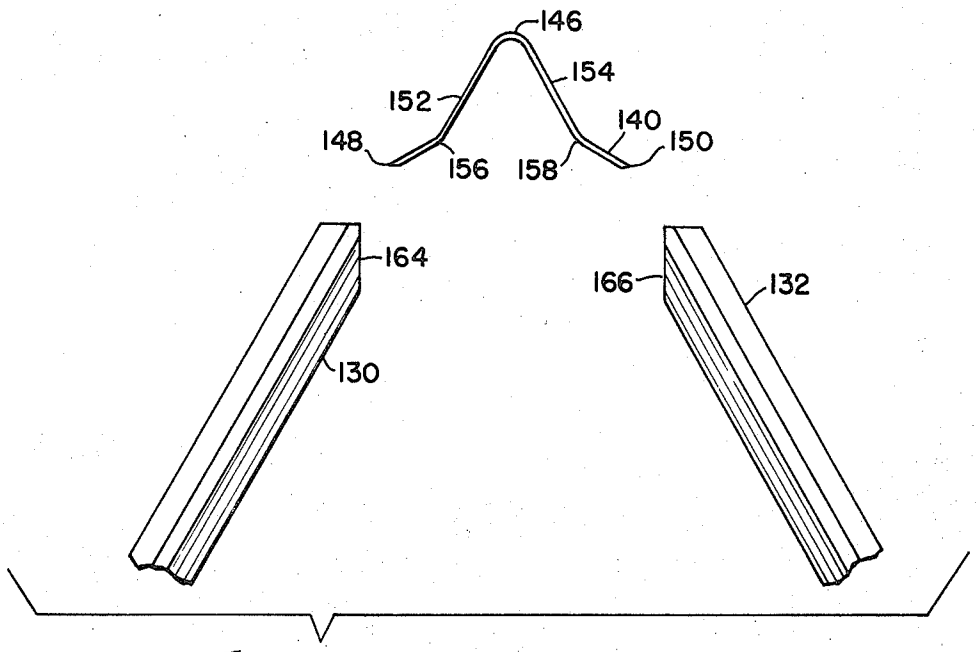


Fig. 7

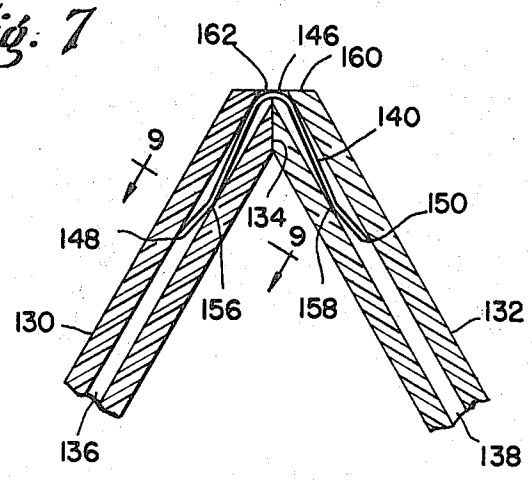


Fig. 8

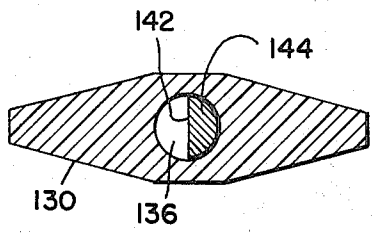


Fig. 9

INVENTOR
ROBERT I. MARTIN

BY

Karl L. Spivak

ATTORNEY

DECORATIVE GRILL JOINT

This is a continuation of application Ser. No. 885,095 filed Dec. 15, 1969, and now abandoned.

BACKGROUND OF THE INVENTION

This invention relates to the general field of building materials and more particularly is directed to decorative window grills of the interlocking plastic bar type adapted for use within the insulating space of insulated glass windows.

In view of the rising costs encountered in the building material industry, it has become increasingly important to find substitute materials and methods which may be employed to replace existing conventional materials and methods in order to save money without undue sacrifice in quality or appearance. Such savings have been almost universally realized in the manufacture of window sash by eliminating the use of individual muntin bars and other window dividers. In this manner, a window manufacturer can now produce a sash having but a single light of glass to thereby completely eliminate the expense of manufacturing and installing individual window bars and as many as six or eight individual panes of glass retained within the window bars.

Even though the initial cost savings realized in the new methods of manufacture can indeed be significant, the advantages thus gained are somewhat offset by the fact that all of the windows so produced look alike and the individual characteristics that were available with prior art constructions can no longer be produced. In order to offset this shortcoming, the use of decorative plastic window bar assemblies affixed to the window sash has become increasingly more popular.

The instant invention finds particular utility in those installations wherein it is desired to employ insulated glass in multi-pane assemblies. It is the present practice to utilize a plurality of panes of insulated glass retained in any well-known manner between fixed window bar members which are secured to the window sash. Such construction combines the advantages of the thermal qualities of insulated glass with the pleasing aesthetic appearance of a multi-light sash. However, the disproportionate expense of this type of manufacture usually outweighs the advantages and such designs are therefore not economically feasible in most instances.

SUMMARY OF THE INVENTION

By employing the instant plastic window bar assembly positioned within the insulating space between the usual spaced panes of glass, single large panes of insulated glass can thus be utilized. In this manner, the former high manufacturing cost of producing sash equipped with a plurality of small panes of insulated glass can thereby be greatly reduced without sacrificing insulating qualities. At the same time, the present construction achieves substantially the same aesthetically pleasing appearance.

It should be further noted that not only are initial installation economies made possible by employing the instant decorative grill construction, but also, continuing savings to the homeowner can be realized through the years by reducing painting costs at the windows through the elimination of the usual muntin bar construction. In accordance with the past practice, each individual window bar must be painstakingly painted with the utmost care to prevent paint from being also applied to the glass. By employing the present invention as herein described, window bar painting can thereby be completely eliminated.

The present invention also teaches inexpensive and unusually secure methods of rapidly and positively joining individual grill bars in angular relation which are respectively suitable for use with decorative grills wherein the individual bars are arranged at right angles to each other and wherein the individual bars are angularly disposed as in the case of diamond shaped grill bar configuration.

It is thereby an object of the present invention to provide an improved decorative grill construction suitable for use with window sash of the double insulated glass type.

It is another object of the instant invention to provide a decorative window grill construction designed to permit the economical utilization of insulated glass in simulated multi-light window installations.

It is another object of the present invention to provide novel grill bar connecting means to positively affix individual grill bars in angular relation.

It is another object of the present invention to provide a decorative insulated glass window construction that is inexpensive in manufacture, rugged in construction and trouble-free when in use.

Other objects and a fuller understanding of the invention will be had by referring to the following description and claims of a preferred embodiment thereof, taken in conjunction with the accompanying drawings wherein like reference characters refer to similar parts throughout the several views and in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view showing an insulated type window with affixed decorative window bars.

FIG. 2 is a side elevational view of an insulated type window glass with affixed diamond grill shaped window bars therein.

FIG. 3 is an exploded, perspective view of the insulated glass and decorative grill construction of FIG. 1.

FIG. 4 is an exploded, perspective view showing the connection of a mitered joint of diamond shaped grill members.

FIG. 5 is a side elevational view of the members of FIG. 4 in assembled relation.

FIG. 6 is a cross-sectional view taken along Line 6—6 of FIG. 5 looking in the direction of the arrows.

FIG. 7 is an exploded, perspective view showing a modified type of connecting pin for use with thin, flat grill bar members.

FIG. 8 is an assembled view, partially in section, showing the construction of FIG. 7 in assembled relation.

FIG. 9 is an enlarged, cross-sectional view taken along Line 9—9 of FIG. 8, looking in the direction of the arrows.

DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE INVENTION

Although specific terms are used in the following description for the sake of clarity, these terms are intended to refer only to the particular structure of my invention selected for illustration in the drawings and are not intended to define or limit the scope of the invention.

Referring now to FIGS. 1, 2 and 3, I show an insulated glass window construction 10 comprising a pair of

glass panels 12, 14 maintained in spaced, insulating relationship by means of a plurality of peripheral horizontal spacing strips 16 and vertical spacing strips 18 suitably joined by corner connectors 20 to thereby provide a sturdy, spaced construction as required to achieve the insulating qualities desired for this type of window installation. A continuous peripheral clip 22 of plastic, metal, such as aluminum or other suitable material overlies the peripheral edges of the spaced, glass panels 12, 14 over the spacing strips 16, 18 in conventional manner to form a stable, structurally secure, functional insulating window assembly suitable for use in building construction.

A plurality of interconnecting plastic muntin bars 24, 26 which are milled to a flat configuration as indicated to conveniently fit within the space provided between the glass panels 12, 14 position within this space for decorative purposes. As illustrated in FIG. 1, the muntin bars 24, 26 may be positioned to assume conventional horizontal and vertical arrangement to simulate the usual six over six or eight over eight type of sash. As illustrated in FIG. 2, the muntin bars may be arranged in diamond configuration to thereby simulate colonial diamond shape window configuration. Most spacers utilized in conjunction with usual insulated glass construction for double hung windows and slider windows provide either a one-quarter inch air space between the inside faces of the glass a five-sixteenth inch air space between the inside faces of the glass. Accordingly, the muntin bars 24, 26 bar for grill connecting purposes. Each pin 32 axially inserts into the respective end of the bars 24, 26 and preferably terminates outwardly in a pointed end 34 to thereby facilitate installation. Each metallic or plastic spacing strip 16, 18 is drilled, punched or otherwise treated to provide a plurality of receiving openings 36 suitably spaced about the periphery of the window construction 10 in alignment with each grill bar projecting pin 32. It is preferable to drill each opening thirty-six two thousandths of an inch less than the diameter of the pin 32 so that each pin 32 inserts within each respective opening 36 in a force fit to thus provide a positive seal at the connection openings. This seal at the spacer opening, 36 prevents powdery portions of the dessicant from filtering through the hole about the pin to thereby enter into and contaminate the insulating space between the glass panels 12, 14.

Referring now to FIGS. 4, 5 and 6, I show a grill joint connection especially suitable for use with diamond shaped decorative window grill bar assemblies. A single joint 100 is illustrated, but it will be appreciated that the principles described herein are applicable to all of the other peripheral joints utilized when fabricating a complete diamond shaped grill assembly. In the embodiment illustrated, a pair of elongated decorative grill bars 102, 104 endwardly join at the mitered edges 106, 108 to form the diamond shaped configuration. As illustrated in FIG. 6, each grill bar 102, 104 is provided with a longitudinal, axially aligned, central bore 110, 112 which extends the entire length of each grill bar. The central bores 110, 112 extend through the mitered edges 106, 108 and communicate near the top edge 114 of the mitered joint 100 to therein receive the bent pin 116.

As best seen in FIG. 4, the bent pin 116 comprises a unitary length of steel rod which is medially bent to form an apex 118 of angular disposition equal to the angular relation of the adjacent grill bars 102, 104 to be connected. The pin 116 is fabricated of an elongated steel rod of cross-sectional diameter less than the cross-sectional diameter of the respective central bores 110, 112 to thereby permit ready insertion of the pin ends 120, 122 respectively within the bores 110, 112. The pin bends inwardly intermediate the ends 120, 122 and the apex 118 to form a pair of restrictive bends 124, 126 for grill connection purposes. As best seen in FIG. 6, the bent pin 116 serves to strengthen and secure the mitered joint 100 by inserting within the central bores 110, 112 until the apex 118 enters the common opening 128 formed by the communication of the ends of the central bores 110, 112 at the top edge 114 of the joint.

It will be appreciated that the pin ends 120, 122 easily insert within the central bores 110, 112 inasmuch as the diameter of the pin is less than the diameter of the bores. As illustrated, the bends 124, 126 bind against the periphery of the respective bores 110, 112 to thereby restrict relative movement between the pin 116 and the grill bars 102, 104. The natural spring of the bent pin construction permits the pin ends 120, 122 to be forced into the grill bores 110, 112 respectively. The bias of the pin material acting at the bends 124, 126 thus serves to prevent the joint from being pulled apart due to the action of frictional forces between each bend 124, 126 and the adjacent peripheral construction of the bores 110, 112. Thus it is seen that an extremely simple construction can be utilized to fabricate an extremely strong diamond shaped joint. The communicating bores 110, 112 at the joint edge 114, provide adequate recess space to receive the entire apex 118 of the pin 116 so as not to interfere with grill attachment methods. The undersized construction of the pin with respect to the diameter of the bores facilitates easy and rapid fabrication of the mitered, diamond shaped joint 100 to thus provide a strong, especially rigid and permanent joint construction.

Referring now to FIGS. 7, 8 and 9, I show another modified joint construction that finds special utility when dealing with decorative grill bars of exceptionally flat construction wherein the greatest dimension perpendicular to the flat axis approaches three-sixteenths of an inch. A pair of flat, decorative grill bars 130, 132, for example having cross-sectional dimensions of three-sixteenths of an inch by five-eighths of an inch and suitable for use within spaced pairs of insulating glass similar to that illustrated in FIG. 3 are employed to form a mitered joint 134 for use with diamond shaped grills.

Each flat grill bar 130, 132 is drilled or otherwise provided with a longitudinal, axially extending, central bore 136, 138, having a cross-sectional diameter of approximately one-sixteenth of an inch. In view of the required small cross-sectional dimension of the respective central bores 136, 138 necessitated by the flatness of the grill bar construction itself, prior workers have found it extremely difficult to work to the same tolerances, usually in the range of plus or minus .002 inches, as is common in other grill bar construction joints. In order to avoid the difficulties occasioned by close tolerances in small dimensions, a novel bent pin 140 of elongated, half-round steel construction has been employed. The pin 140 is fabricated with a flat, diametrical edge 142 and a rounded, semi-cylindrical edge 144 sized to readily fit within the one-sixteenth inch bores 136, 138 of the flat grill bars 130, 132 without undue

binding. By utilizing such a pin configuration, I have found that tolerances of plus or minus three-one thousandths of an inch can be employed without looseness, flexing or other objectionable joint features.

Similar to the construction illustrated in FIG. 4, the bent pin **140** medially bends at the apex **146** intermediate the pin ends **148, 150.** Each pin leg **152, 154** respectively bends out of alignment at **156, 158** for grill bar, central bore restricting purposes in the same manner as hereinbefore described at FIG. **10.**

Referring now to FIG. **8,** the pin **140,** is illustrated in position with the pin ends **148, 150** respectively inserted within the central bores **136, 138.** The respective bends **156, 158** restrict against the sides of the central bores **136, 138** and the bias of the pin steel construction serves to prevent the bars **130, 132** from pulling relative to the pin **140.** The central bores **136, 138** communicate at the top edge **160** to provide a top recess **162** which is of adequate size to receive the pin apex **146** therein. Each grill bar **130, 132** terminates upwardly in a mitered edge **164, 166** which are held in edge to edge juxtaposition by the action of the pin **140** within the communicating central bores **136, 138** to thereby provide a rigid, easily assembled and sturdy mitered joint **134.**

I claim:

1. In a joint for connecting angular abutting members of a decorative grill wherein the grill bars are provided with small, axially aligned bores, the combination of

A. a pair of elongated grill bars each having a joined end and a free end,
   1. the said bars abutting at the said joined ends thereof in angular relation,
   2. each said axially aligned bore extending through the joined end,
      a. each bore being fabricated with a cross sectional dimension of approximately one-sixteenth of an inch,
      b. the said bores communicating at the joined ends thereof to form an end positioned recess, the recess being accessible from outside of the joint; and

B. a pin, said pin being bent intermediate its length to form an apex and a pair of bore insertable legs angularly extending from the apex,
   1. said pin being half round in cross-sectional configuration,
   2. said pin having a cross-sectional diameter less than the dimension of each bore,
   3. each said bore insertable leg being bent only once intermediate its length to form a bore restrictive bend,
   4. the said apex of the pin being positioned within the recess and being exposed from outside of the joint,
   5. each said bore insertable leg inserting within the bore of an abutting grill bar to secure the grill bars in angular relation,
      a. each said bore restrictive bend binding against a portion of the periphery of its associated bore to restrict relative movement between the pin and the grill bars,
   6. said pin being fabricated of steel and having a natural spring bias,
      a. the spring bias of the pin material acting at the said bore restricing bends to develop sufficient frictional forces, between the pin and the bar construction which defines the bores to prevent the joint from being easily pulled apart.

* * * * *