

E. McCLURE.
GRATING, SCREEN, SCREEN-DOOR CONSTRUCTION, AND THE LIKE.
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942,039.

Patented Nov. 30, 1909.

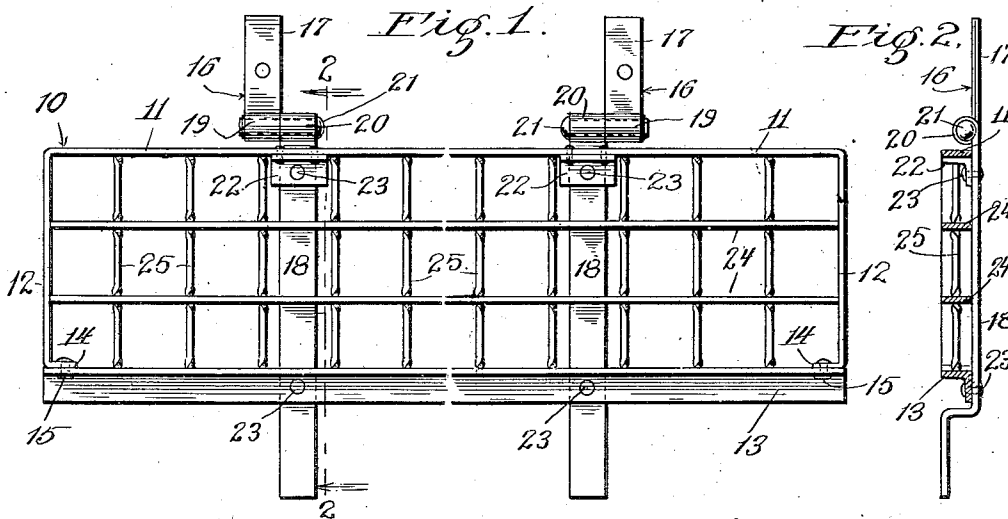
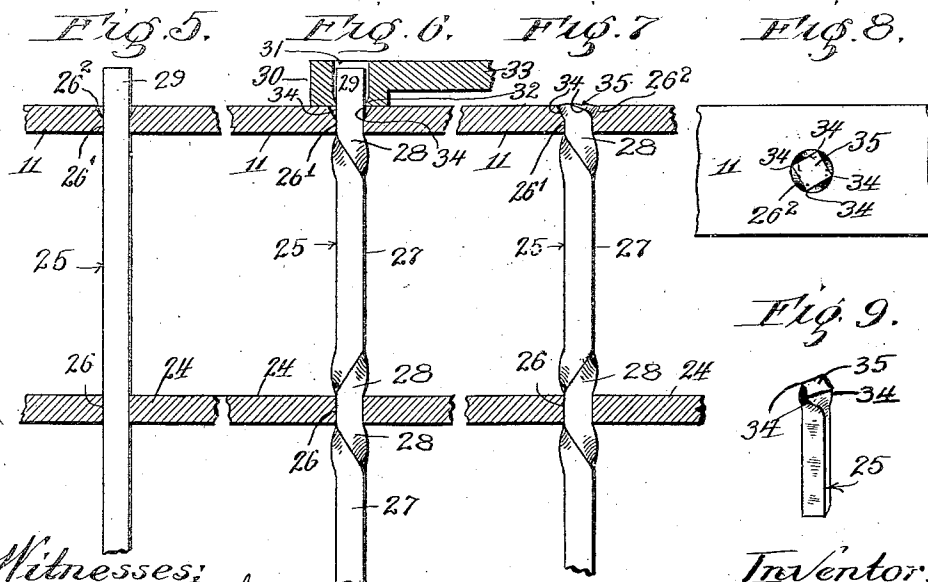


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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GRATING, SCREEN, SCREEN-DOOR CONSTRUCTION, AND THE LIKE.

942,039.

Specification of Letters Patent. Patented Nov. 30, 1909.

Application filed December 24, 1908. Serial No. 469,143.

To all whom it may concern:

Be it known that I, EDWARD McCLURE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Gratings, Screens, Screen-Door Constructions, and the Like, of which the following is a specification.

This invention relates to gratings, screens screen-door constructions and the like, for refrigerator cars or other places, and it relates more particularly to means for connecting or joining various of the members thereof.

One object of the invention is to provide an improved joint or connection for the intersecting members of open work structures such as gratings, screens, ladders, fences or the like, so as to form a simple, substantial and comparatively inexpensive construction. The customary manner of joining such members is to brace them together or to pass one member through an opening in the other member and head or upset the metal of the first mentioned member upon the other one. These constructions are expensive, and require considerable labor and time in the making thereof.

It is my aim to simplify and otherwise improve the connection between intersecting members and to such end this invention consists in certain novel features of construction and arrangement, a description of which will be found in the following specification and the essential features of which will be particularly pointed out in the claims appended hereto.

The invention is clearly illustrated in the drawings furnished herewith, in which—

Figure 1 is an elevation of a grating or screen containing my improvements, Fig. 2 is a vertical cross section taken on the line 2—2 of Fig. 1, Fig. 3 is a plan view of a fragment of the upper longitudinal marginal member, Fig. 4 is a plan view of a fragment of an intermediate longitudinal member, Figs. 5, 6, and 7 are detail vertical, longitudinal sections of two of the longitudinal members and a transverse member of the screen, showing the various stages arising in the process of construction, Fig. 8 is a plan view of a fragment of the upper longitudinal member after the joint has been made, and Fig. 9 is a perspective view of a fragment of one of the transverse members,

illustrating the form which is taken by the end of said member after a joint has been made with the upper longitudinal member.

The structure illustrated in the drawings is primarily intended for use in connection with refrigerator cars, where it is desired to have a stationary upper grating or screen and a movable lower grating or screen through which the air may circulate between the ice chamber and the cold storage chamber. In such constructions it is usual to provide an intermediate wall between the stationary upper screen and the movable lower screen.

In the drawings, 10, represents a bar or band of metal which is bent to form a top member 11, and two side members 12, the lower ends of the side members being connected with a lower member 13, as for instance by bending the terminal ends of the side members 12, to form right angle lugs or projections 14, which may be secured to the lower member 13, as for instance by means of rivets 15. This provides a rectangular inclosing frame in which is supported the other members of the screen. If desired the lower member 13, may be in the form of a bar of angle iron or other structural iron and where the screen is employed as a swinging screen, hinges 16, are provided, which hinges are secured to the screen and the wall or object from which it is desired to support the screen. If, however, the screen is to be stationary, it may be rigidly fastened to the wall or other support in any suitable manner. In the forms illustrated the screen is arranged to be swung upon its support and as shown, each of the hinges comprises two straps 17, 18, formed with knuckles 19, 20, through which extend pintle pins 21. Brackets 22, are secured to the upper member 11, of the frame and the strap 18, of the hinge is secured to said bracket and to the lower member 13, of the frame by rivets or other connecting devices 23. This form of arrangement is of course not material to my invention, broadly speaking, as any form of connection between the hinge and screen may be employed.

Between the outer longitudinal members of the screen are a plurality of longitudinally extending bars or strips 24, which may be secured to the side members 12, in any desirable manner. A plurality of transversely extending members 25, complete the screen,

and said transversely extending members 25, are non-circular in cross section and extend through correspondingly shaped holes 26, 26', in the longitudinal members. As shown the transverse members are square in cross section, but of course any other many sided rod or bar may be substituted for the square bar. The horizontal members are provided with suitably spaced holes 26, which as shown are square and arranged to fit the square, transverse members, and the holes 26', in the outer longitudinal members are countersunk or formed with outwardly flaring openings 26², the purpose of which will appear later on.

In constructing the screen, the transverse rods are cut of such length as to be slightly longer than the side members 12, and said rods are thrust through alined openings of the various longitudinal members, with the ends protruding slightly beyond the upper and lower members 11, 13. The transverse members are then twisted upon themselves at points between the adjacent longitudinal members as shown at 27 in Fig. 6, so as to form shoulders or abutments 28, engaging with the contiguous, longitudinal members. This twisting of the transverse members not only has the effect of spacing the longitudinal members apart, but adds to the ornamental appearance of the screen. After the transverse members have been twisted, the connection between them and the upper and lower longitudinal members is effected. This is done by twisting the protruding ends 29, upon themselves and then shearing off the protruding ends after they have been twisted, thereby leaving the outer faces of the upper and lower longitudinal members practically flush so that no projections will remain thereupon.

A key or twisting device has been provided for twisting and cutting off the protruding ends and as shown said key consists in a head 30, having a square opening 31, therein adapted to fit over the end of the transverse member and having cutting edges 32, adapted to shear the member after it has been properly twisted. A handle 33, projects from the head 30, and completes the key. In forming the joint between the transverse member and upper and lower longitudinal members, the key is slipped over the protruding end of the transverse member and turned around. The turning of the key first operates to twist the end of the transverse member and the corners 34, thereof in turning around follow the contour of the flaring opening in the form of spirals, thus providing a spiral head or enlargement 35, upon the end of the transverse member. The continued turning of the key causes the cutting edge 32, to shear off the protruding end 29, thus leaving the transverse member practically flush with the outer face of

the longitudinal member. The longitudinal member is therefore confined between the twisted head 35, and shoulder 28, of the transverse member, and is securely joined thereto.

While I have shown the invention as applied to a screen it is evident that the joint may be used in various places where it is desired to connect one member with the other; further that the design or shape of the members is immaterial and that various ornamental screens or other devices may be constructed in which this joint may be incorporated, and that various alterations and modifications of the device are possible without departing from the spirit of my invention and I do not therefore desire to limit myself to the specific construction shown and described except as may be necessitated by the prior state of the art.

I claim as new and desire to secure by Letters Patent:

1. The combination of longitudinal members having non-circular perforations therein, the perforations in the outer members being countersunk upon the outer face of said members, and transverse members extending through said perforations and fitting therein, said transverse members having twisted portions adapted to form shoulders which abut against the longitudinal members, and having twisted terminal ends within the countersunk portions of the perforations adapted to form heads that are seated therein.
2. A joint for intersecting members, comprising one member which contains a countersunk perforation, and a member extending through said perforation and having a twisted terminal end seated in the flaring portion of the countersunk perforation.
3. A joint for intersecting members, comprising a member having a countersunk perforation, and a shouldered member extending through said perforation, and having a twist in its terminal end adapted to form a head which engages with the flaring wall of the countersunk portion of the perforation, said head being flush with the outer face of the first named member.
4. A joint, comprising one member having a countersunk, non-circular perforation, and a second member extending through said perforation and fitting therein, said second named member having a twisted portion adapted to form a shoulder abutting against one side of the first named member, and having a twist in its terminal end adapted to form a head which engages with the flaring wall of the countersunk part of the perforation.
5. A joint, comprising a member having a countersunk square opening, and a member of square cross section fitting in said opening in the first mentioned member, said sec-

ond named member having a shoulder abutting against one face of the first named member, and having a twist in its terminal end adapted to form a head which engages with the flaring wall of the opening.

6. A joint, comprising a bar having a countersunk, square opening therein, and a transverse bar fitting in said opening, said second named bar having a twisted portion adapted to form a shoulder abutting against one face of the first named bar, and having a twist in its terminal end adapted to form a head which engages with the countersink of the opening.

7. A joint, comprising a bar having a countersunk, square opening therein, and a

bar fitting in said opening, said second named bar having a twisted portion adapted to form a shoulder abutting against one face of the first named bar and having a twist in its terminal end adapted to form a head within the countersunk portion of the opening, said head being substantially flush with the outer face of the first named bar.

In witness whereof, I have hereunto subscribed my name at Chicago, Cook county, Illinois, this 17th day of December A. D. 1908.

EDWARD McCLURE.

Witnesses:

R. R. BARNITT,
K. H. THORP.