July 12, 1938. G. H. KEHR ET AL 2,123,366

STRUCTURAL SUPPORT

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Fig. 1.

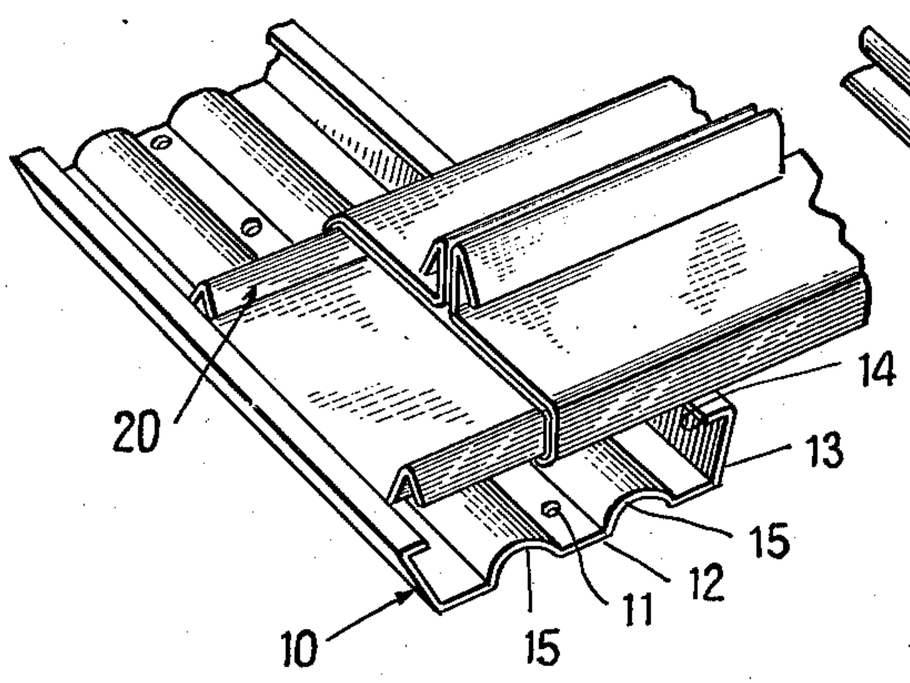


Fig. 3.

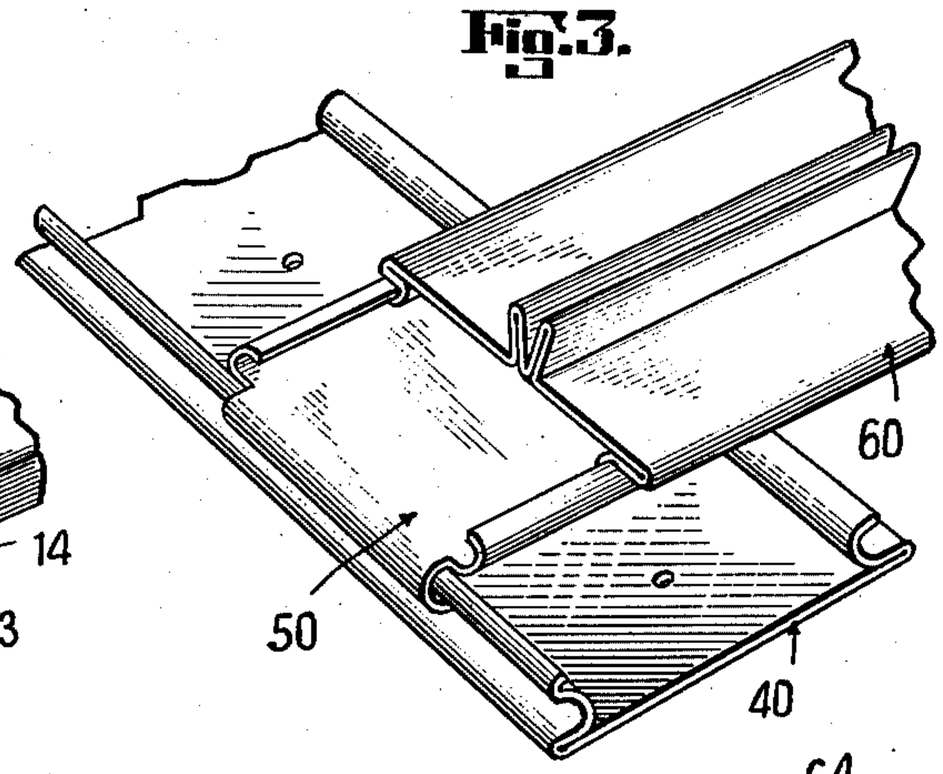


Fig. 4.

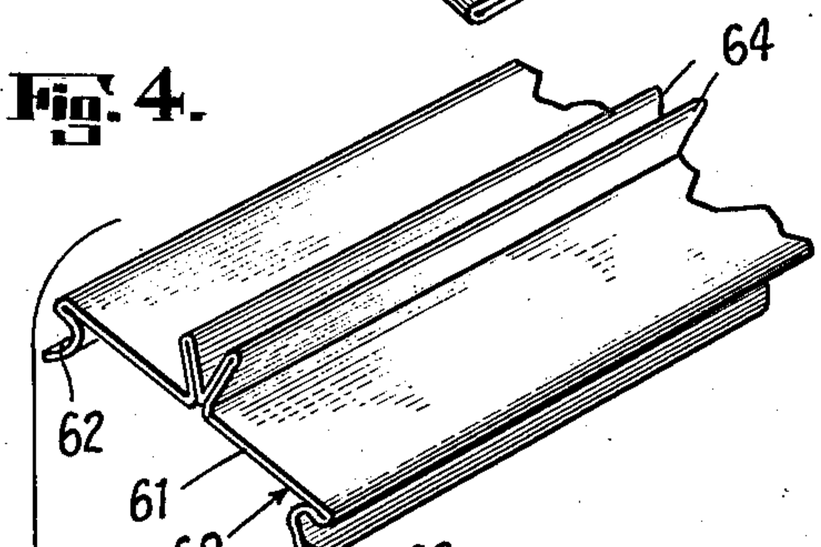
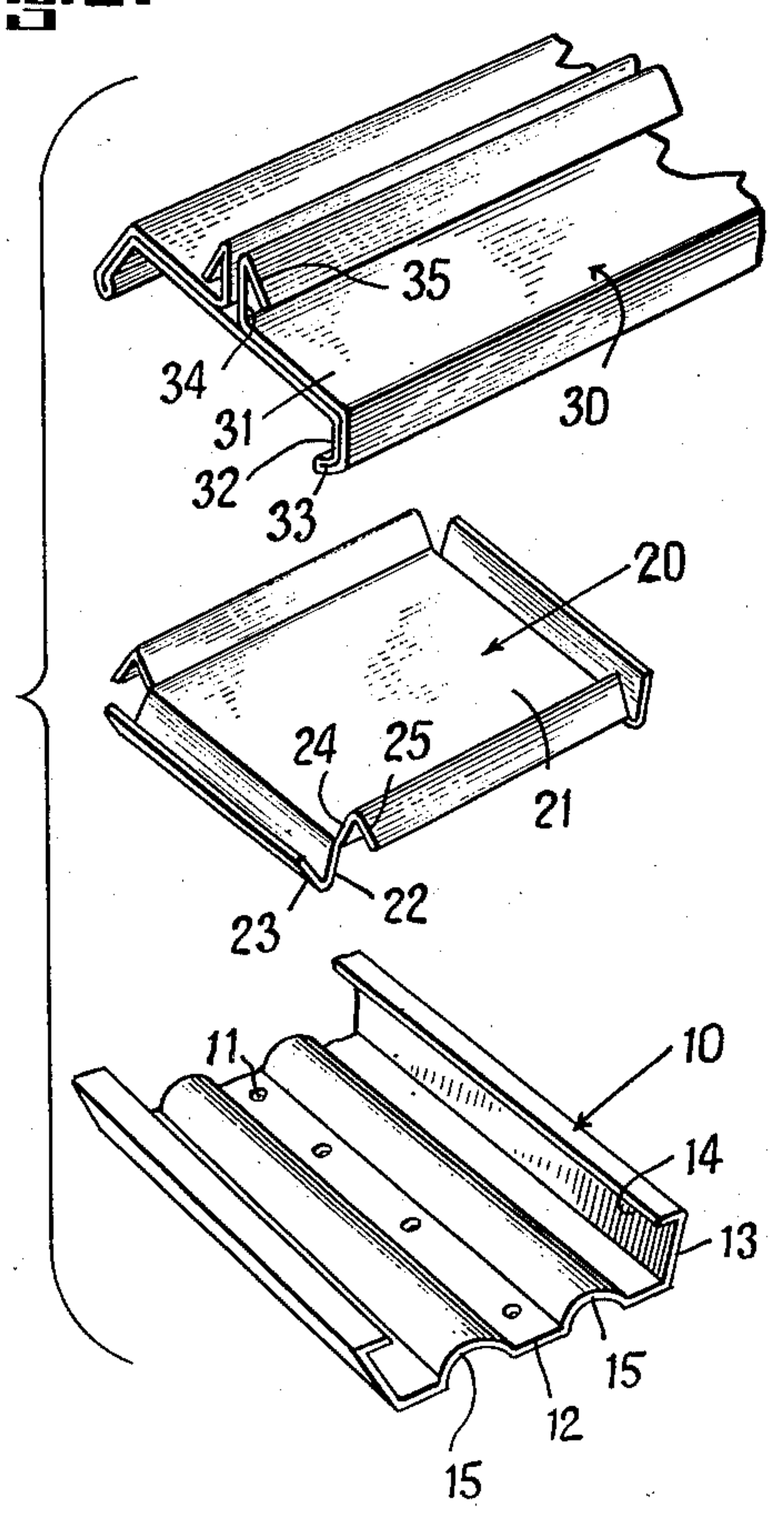


Fig. 2.



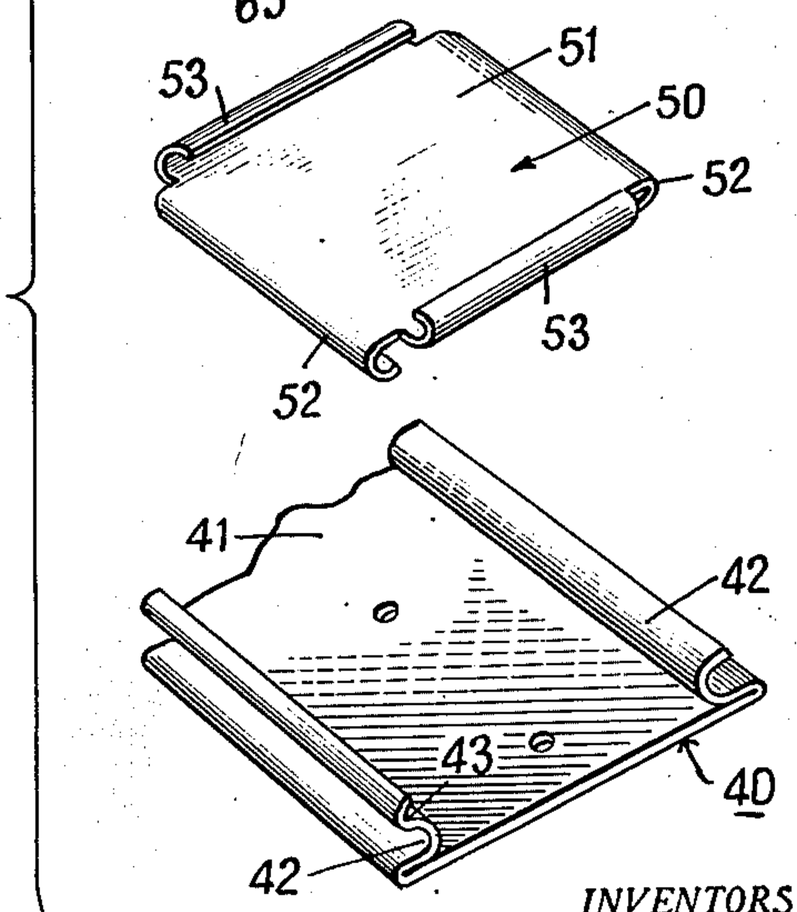


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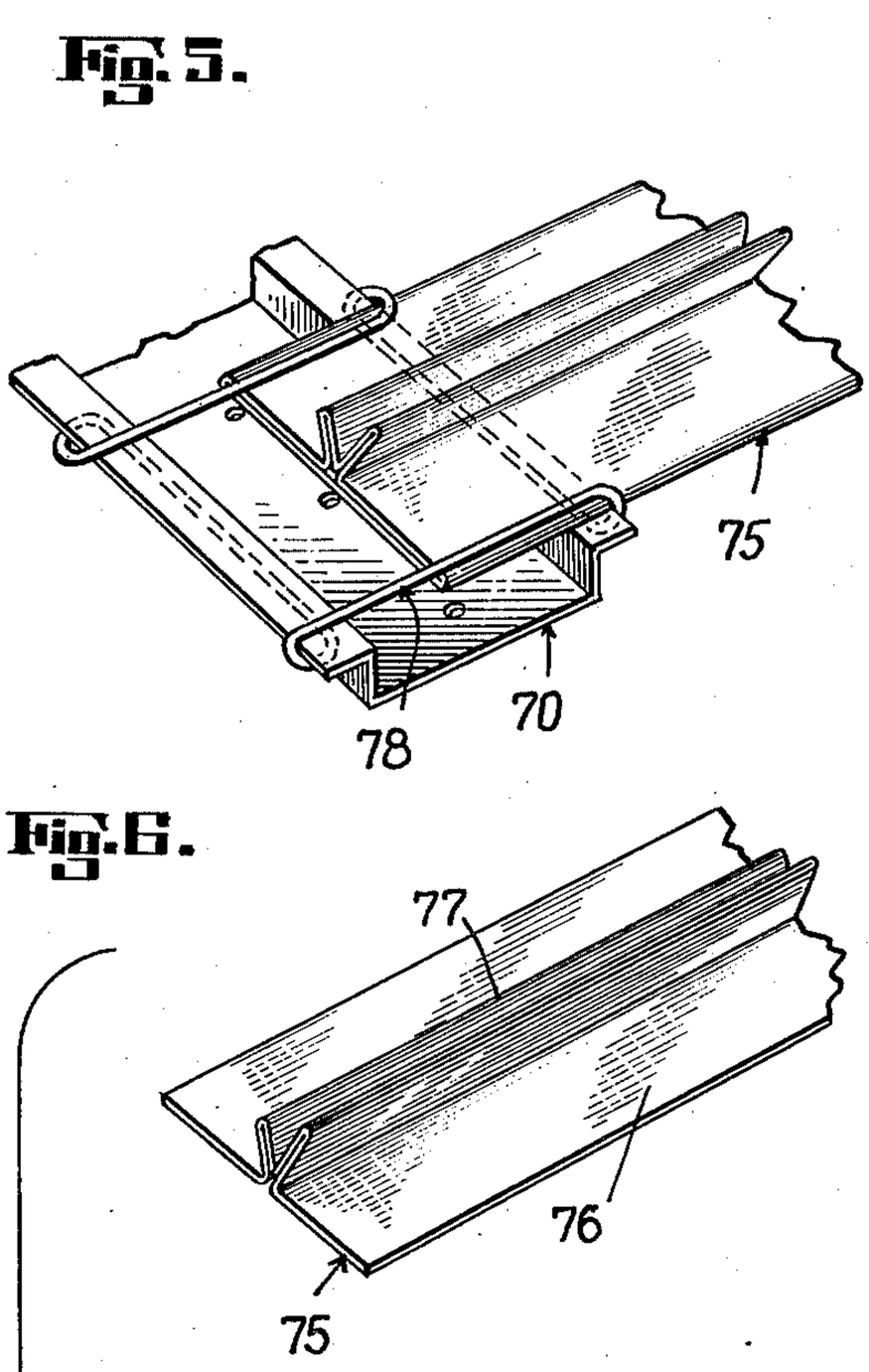
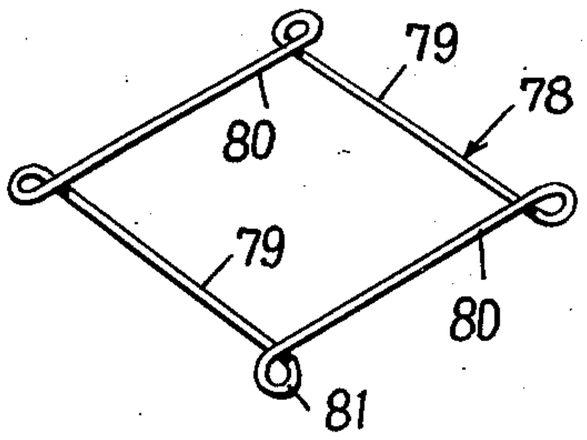
Fig. 5.

Fig. 6.





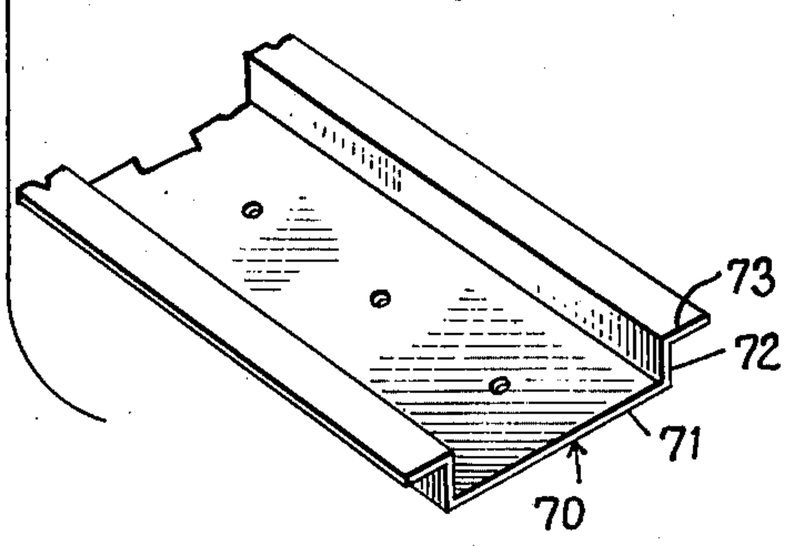


Fig. 7.

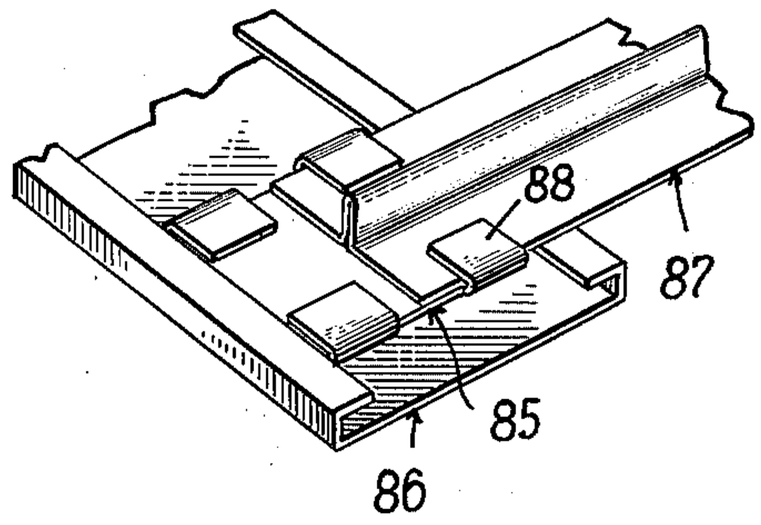


Fig. 8.

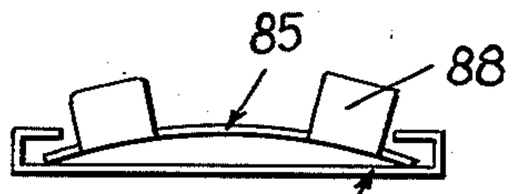
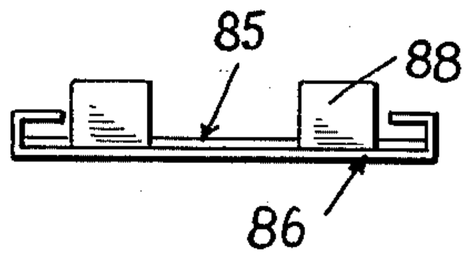


Fig. 9.



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UNITED STATES PATENT OFFICE

2,123,366

STRUCTURAL SUPPORT

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Application December 23, 1936, Serial No. 117,252

3 Claims. (Cl. 189—34)

The present invention relates to structural supports and has for an object the provision of improvements in this art.

The supporting apparatus hereby provided is particularly adapted for supporting wall surfacing material such as tile, concrete blocks, enameled pans, stucco blocks, steel blocks, shelving and the like and constitutes simple, conveniently installed and widely adaptable means for supporting surfacing elements, even when they are of various sizes.

The present application is a continuation in part of our co-pending application, Serial Number 66,098, filed February 27, 1936 and the general objects, advantages and features recited in that application are inherent in the present invention.

It is deemed unnecessary to review in detail these general objects, advantages and features. For simplicity the present description will be limited to a recitation of those benefits which are peculiar to the present invention. However, it may well be noted that the present invention, in common with the prior invention, provides structural supporting apparatus which in general comprises coordinate members adjustably united by connector members. One group of coordinate members may be secured to a wall, usually in vertical position, to form the ground or foundation for supporting the remainder of the apparatus and the surfacing elements carried thereby. So this first group of coordinate members may be referred to as ground or track members. The other group of coordinate members upon which the surfacing material is supported and which are usually disposed in a horizontal position, may be referred to as stringer members. The members through which the stringer members are secured to the ground members may be referred to as connector members.

One of the features of the present invention is the provision of a construction which permits the connector members to be introduced and attached to the coordinate members along the length thereof, thereby making it unnecessary to introduce the connector members at the ends of the coordinate members. This permits any number of connector and stringer members to be secured to the ground members as and where they are found necessary.

Another feature of the present invention is the provision of a construction in which the connector members engage the coordinate members by distortion as with a snap or wedge action and maintain a frictional engagement therewith. This permits the connector members to be moved into any desired position after they have been placed on the ground members. The frictional engagement is made adequate to hold the connector members in position even when considerable force is employed tending to move them.

Other objects, advantages and features of the present invention will be apparent from the following description of certain specific embodiments of the invention, reference being made to the accompanying drawings wherein:

Fig. 1 is a perspective assembly view of apparatus embodying the present invention;

Fig. 2 is a similar view but showing the parts separated from each other;

Figs. 3 and 4 are views corresponding to Figs. 1 and 2 showing a modification;

Figs. 5 and 6 are views corresponding to Figs. 1 and 2 showing another modification;

Fig. 7 is a perspective view of a further modification;

Fig. 8 is a sectional view of the ground and connector members shown in Fig. 7 in an assembling stage; and

Fig. 9 is a sectional view similar to Fig. 8 but showing the parts after assembly.

Referring first to the modification illustrated in Figs. 1 and 2, there is shown a ground member 10 which may be secured to a wall or other foundation in any convenient manner as by nails or screws passing through holes 11 provided in the base 12 of the member. Upstanding sidewalls 13 carrying inturned flanges 14 form guides or tracks for retaining a connector member 20. The sidewalls 13 flare outwardly and the flanges 14 incline slightly downward. The sidewalls are sufficiently deep to give rigidity to the ground member. Further rigidity is provided by forming longitudinal ribs 15 in the base 12.

The body 21 of the connector member 20 is provided with downwardly extending sidewalls 22 carrying upturned flanges 23 for engaging beneath the flanges 14 of the ground member. The sidewalls and flanges are inclined to provide easy engagement. On its opposite side the body member 21 is provided with similar inclined sidewalls 24 and flanges 25 for engaging and retaining a stringer member 30.

On one side of the body 31 of the stringer member 30 there are provided inclined sidewalls 32 and flanges 33 for cooperating with the flanges 23 of the connector member. On the other side of the body 31 of the stringer member 30 there are provided upstanding walls 34 carrying downturned inclined flanges 35. These flanges 35 are

adapted to enter grooves formed in pieces of tile or other members which are to be supported, as disclosed in the copending application referred to. The stringer member may conveniently be formed from a single thickness of material folded up as clearly illustrated in Figs. 1 and 2.

All of the members **10**, **20** and **30** may be formed of sheet metal and are sufficiently resilient to permit of their being snapped together. The connector member may thus be introduced and secured to the ground member at any point along the length of the latter, while the stringer member may be introduced and secured to the connector member at any point along the length of the former. This avoids the necessity for introducing the connector member at the ends of the ground and stringer members and makes the apparatus much more convenient to assemble.

The connector member has a resilient frictional engagement with the ground and stringer members which is adequate to maintain it securely in position except when considerable force is applied to move it. For example, the strength of engagement may be made such that the connector member can barely be moved by hand but can readily be moved along the retaining flanges or tracks when given a blow as by a hammer. When the connector member has been moved into its final position it may there be retained by making a permanent deformation in some or all of the members. For example, the flanges of the ground member may be bent by a hammer as disclosed in the copending application.

While the upstanding elements **24** and **25** are shown herein as being formed directly on the body **21** of the connector member the construction may be varied to permit different applications of the apparatus as disclosed in the copending application.

In Figs. 3 and 4 there is shown a modified construction in which the body **41** of the ground member **40** is provided with reversely turned curved retaining flanges **42**, one or both of which may be turned inward in a lip **43** to form a rounded outer surface to assist the engagement with the connector member.

The cooperating connector member **50** may be provided on one side of the body **51** with inwardly curved flanges **52** for cooperating with the flanges **42** of the ground member **40**. On the other side of the body **41** the ground member **40** may be provided with similar inwardly curved flanges **53** for cooperating with the flanges of a stringer member.

The stringer member **60** may be provided on one side of the body **61** with reversely turned retaining flanges **62**, one or both of which may be turned inward in a lip **63** to form a rounded outer surface to assist the engagement with the connector member. On its outer surface the stringer member **60** is provided with divergent flanges **64** for engaging pieces of tile or other members which are to be supported. The stringer member may be formed of a single thickness of material bent into form as shown.

If desired, the connector member may be provided with retaining elements on one or both sides like those shown on the ground and stringer members, in which case the ground or stringer member or both will be provided with retaining elements like those shown on the connector member. In other words, the retaining flanges may be reversed as between the connector member on the one hand and the coordinate members on the other hand. This applies also to the form shown in Figs. 1 and 2.

Where only one of a pair of flanges is provided with an inturned lip, as illustrated, the parts may be assembled by first engaging the plain flanges of the cooperating members and then forcing the other flanges past each other, the curved outer surface of one flange assisting in this action.

In the embodiment shown in Figs. 5 and 6 the ground member **70** is provided with a body **71**, upstanding sidewalls **72** and outwardly turned flanges **73**. The stringer member **75** is formed with a flat body portion **76** and a flat folded rib **77**. Here the connector member **78** may be formed of wire or the like to provide inturned ground engaging portions **79** and stringer engaging portions **80**. The portions **79** and **80** are connected by loops **81** which provide spacing for engagement of the member with juxtaposed ground and stringer flanges. The connector member **78** is sufficiently resilient to permit it to be snapped on the ground and stringer members at any point therealong.

In Figs. 7 to 9 there is shown an embodiment in which the connector member **85** is given a permanent rather than a temporary deformation when it is being attached to the flanged ground member **86** and the stringer member **87**. When the connector member is bent, as shown in Fig. 8, it may be inserted between the flanges of the ground member at any point therealong. When it is straightened out, as shown in Fig. 9, it will frictionally engage the ground member. There may be two stages of engagement if desired, a first stage in which the member is not quite fully straightened so that it will have a frictional sliding engagement with the ground member and a second stage in which the connector member is fully straightened so that it will have a locking engagement with the ground member. For better engagement the outer edges of the connector member may be roughened or pointed in places.

The connector member is provided with upstanding elements **88** for engaging the stringer member. These are preferably made relatively narrow so as not to interfere with the bending action in the connector member. The upstanding elements **88** may be bent over the stringer member after it has been placed.

It will thus be seen that the present invention provides simple and extremely flexible constructions for structural supports, including coordinate members and connector members. The connector members and stringer members may be introduced at any time as the construction progresses and may be moved to any desired position along the ground members and there secured. Furthermore, an improved construction in which the parts are engaged by distortion is provided. There are also advantages in the particular forms of construction provided.

While a few embodiments of the invention have been particularly described it is to be understood that the invention is susceptible of being variously embodied within the limits of the prior art and the scope of the subjoined claims.

We claim:

1. Structural supporting apparatus comprising in combination, a ground member adapted to be secured to a fixed support, upstanding inclined flanges on said ground member, at least one of said flanges terminating in an overhanging abruptly ending edge, a stringer member shaped like said ground member but being reversed in

position as used and being provided with outstanding portions adapted to carry a load, and a flanged connector member shaped to fit the flanged portions of said ground and stringer members, the flanges of said connector member being inclined and turned over to form abrupt overhanging edges whereby the connector member may be snapped laterally into engagement with and securely locked with said ground and stringer members at any point along the lengths thereof.

2. Structural supporting apparatus comprising in combination, a ground member adapted to be secured to a fixed support, upstanding inclined flanges on said ground member, at least one of said flanges terminating in an overhanging abruptly ending edge, a stringer member shaped like said ground member but being reversed in position as used and being provided with outstanding portions adapted to carry a load, and a flanged connector member shaped to fit the flanged portions of said ground and stringer members, the flanges of said connector member being inclined and turned over to form abrupt overhanging edges whereby the connector member may be snapped laterally into engagement with and securely locked with said ground and stringer members at any point along the lengths thereof, the flanges of said connector member being V-shaped and turned outwardly and the flanges of said ground and stringer members being V-shaped and turned inwardly.

3. Structural supporting apparatus comprising in combination, a ground member adapted to be secured to a fixed support, upstanding inclined flanges on said ground member, at least one of said flanges terminating in an overhanging abruptly ending edge, a stringer member shaped like said ground member but being reversed in position as used and being provided with outstanding portions adapted to carry a load, and a flanged connector member shaped to fit the flanged portions of said ground and stringer members, the flanges of said connector member being inclined and turned over to form abrupt overhanging edges whereby the connector member may be snapped laterally into engagement with and securely locked with said ground and stringer members at any point along the lengths thereof, the flanges of said connector member being curved inwardly to the abrupt overhanging edges, and the flanges of said ground and stringer members being curved outwardly and one of said flanges terminating abruptly in its out-turned edge.

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