

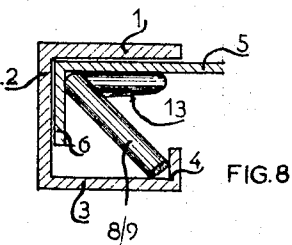
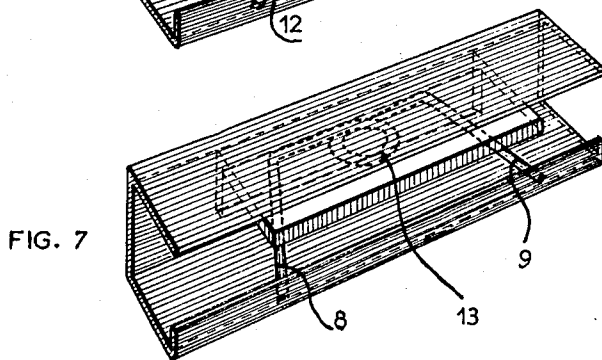
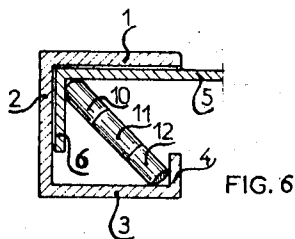
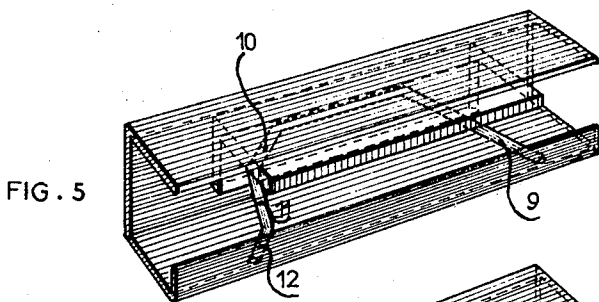
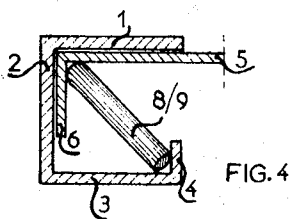
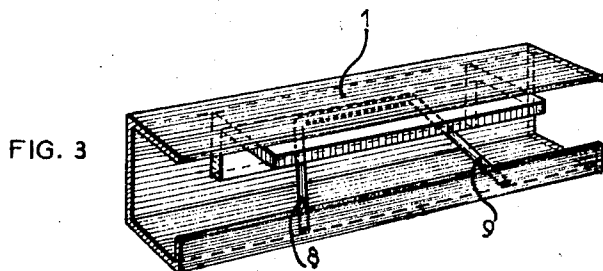
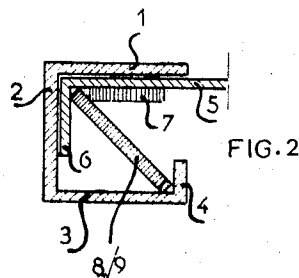
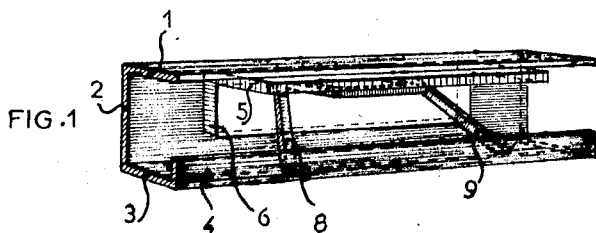
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3,516,698

CLIP

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3,516,698

CLIP

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4 Claims

ABSTRACT OF THE DISCLOSURE

A clip used to secure two angled members in assembled relationship to each other comprising a central arm and two lateral arms. The central arm may be in the shape of a loop, straight wire or planar figure and engages the inner surface of one angled member when in operable position. The lateral members simultaneously engage the lower inner surface of the second angled member by being bent down so that they extend angularly outward and downward from the top inner surface of the inner angled member.

In one known system for assembling two metal section members without damage to their surfaces, a bracket in the form of a right angled member is clamped against the inner surface of each of the two metal section members by a spring clamping plate.

In this known system, bending of the spring strip enables the same to be introduced into the associated section member and provides the force for anchoring the terminal edges of the spring strip in the section member, by construction, however, spring strip width governs the internal dimension of the section member and angle-iron wall thickness, the internal dimension of the section member being the sum of spring strip width and angle-iron wall thickness.

This feature is a disadvantage for some constructions, since the three members which it is required to assemble together may differ in their dimensions for reasons of manufacture; consequently, a clip of the kind described is of use only for accurately dimensioned metal structures and cannot be used for assemblies of structures made of materials, such as concrete, which are associated with less dimensional accuracy.

Another disadvantage of such a clip is that an appropriate extraction tool must be used to remove the clip at disassembly.

The clip according to the invention obviates these two disadvantages, thus improving operating conditions and reducing building costs.

The clip according to the invention is embodied from round or square spring steel bent to form at least three arms—one central arm and two lateral arms—the ends of the lateral arms serving mainly for anchorage. The two dihedral angles formed by the bending step between the central arm and the two lateral arms are of variable opening to help take up dimensional tolerances in the items which it is required to assemble.

The clip can be stressed in its bending plane and in a plane perpendicular thereto to provide a torsion giving improved anchorage of the ends of the lateral arms in the dihedral angle formed by the section-member lip with its adjacent plane.

The plan size of the clip according to the invention varies in inverse proportion to its longitudinal extent, its minimum plan size corresponding to the clip being completely flat—i.e., to the shape of the round or square spring steel stock before the same is bent to form the three arms. Between this minimum size and the size

in any operative position, the clip automatically adjusts itself to a shape causing the central arm to bear in the right dihedral angle of the connecting angle-iron and the ends of the lateral arms to be anchored in the dihedral angle which the section-member lip forms with its adjacent plane, the effectiveness of the clip resulting from the fact that its two ends are anchored by the load. However, the anchorage of at least one of the two lateral arms can be rendered temporarily inoperative by using an ordinary lever to separate the two ends of the lateral arms from one another. This feature makes adjustment very easy, enabling as it does the angle-iron to be slid relatively to the bearing section member without any need to withdraw the clip, the anchorage of which is restored immediately the two ends of the lateral arms cease to be separated from one another.

Details of the invention will be disclosed by the description, reference being made to the accompanying drawings wherein:

FIG. 1 is a perspective view of a section-member assembled with its connecting angle-iron with the use of the clip according to the invention in its preferred form of square spring steel stock, the central arm of the clip being trapezoidal in shape to spread the bearing load over the angle-iron;

FIG. 2 is an end view of the assembly shown in FIG. 1;

FIG. 3 is a perspective view showing the same section-member assembled with the same angle-iron but using the simplest embodiment of the clip according to the invention, the clip of this embodiment having three arms, the two lateral arms being of different lengths and inclinations;

FIG. 4 is an end view of the assembly shown in FIG. 3;

FIG. 5 is a perspective view showing the same section-member assembled with the same angle-iron but using an embodiment of the clip according to the invention wherein one of the two lateral arms has a number of bends;

FIG. 6 is an end view of the assembly shown in FIG. 5;

FIG. 7 is a perspective view showing the same section member assembled with the same angle-iron but with the use of a clip according to the invention wherein the central arm is loop-shaped in order, as in the case shown in FIGS. 1 and 2, to spread the bearing load over the angle-iron;

FIG. 8 is an end view of the assembly shown in FIG. 7.

In the drawings, a known form of section-member comprises three surfaces 1–3 and a lip 4; a known of connecting angle-iron comprises a plane 5 tangential to section-member surface 1 and a plane 6 tangential to section-member surface 2, the planes 5, 6 forming the sides of a right dihedral angle.

Referring to FIGS. 1 and 2, the clip has a central arm 7 which is in a trapezoidal shape so as to increase the bearing surface of angle-iron plane 5, the plane of the trapezium forming, before introduction of the clip into the section-member, a dihedral angle of 90° with the plane of the two lateral arms 8, 9 of the clip, this dihedral angle becoming acute-angled after introduction into the section member; the two ends of the lateral arms become anchored in the dihedral angle formed by section-member lip 4 and the surface 3 adjacent lip 4.

Referring to FIGS. 3 and 4, the clip central arm 1 is simply rectilinear so as to bear in the right dihedral angle of the angle-iron 5, 6.

Referring to FIGS. 5 and 6, one of the lateral arms of the clip comprises three bends 10–12; the other items are unchanged as compared with FIGS. 3 and 4.

Referring to FIGS. 7 and 8, the central arm of the clip comprises a loop 13 which, as in the case shown in FIGS. 1 and 2, helps to spread the bearing load over angle-iron plane 5, the plane of the loop forming, before introduction

of the clip into the section-member, a 90° dihedral with the plane of the two lateral arms 8, 9, such dihedral becoming acute-angled, as can be seen in FIG. 8, after introduction into the section member.

A clip of this kind is very easy to position, whatever the shape of its central arm may be, and it is self-removing immediately one of the ends of the lateral arms is raised above the lip 4.

What I claim is:

1. A clip for connecting two angled structural members one within the other, where one member is channel-shaped with a lip on one leg, comprising a bar of spring steel having a substantially greater length than its thickness, the bar having a central arm and two lateral arms being of different length and inclination than the central arm; a variable angle formed between the lateral arms and the central arm when the clip is inserted against the inner surface corner of a structural member; the ends of the lateral arms being anchored by the load in the dihedral which the lipped leg of the channel member forms with its adjacent plane.

2. A clip as defined in claim 1, wherein the bar of steel is round.

3. A clip as defined in claim 2, wherein the central arm forms a closed loop for frictional engagement in an oblique plane to the plane of the lateral arms and in a

plane parallel to the planes of the legs of the channel-shaped member.

4. A clip as defined in claim 1, where the bar of steel is square.

References Cited

UNITED STATES PATENTS

2,714,432	8/1955	Blanchard	52—502
2,742,116	4/1956	Fitzgerald	287—189.35
2,897,620	8/1959	Fitzgerald	287—189.35
3,205,628	9/1965	Frisk	52—222
3,323,819	6/1967	Barker	287—189.36
3,344,573	10/1967	Martin et al.	52—400
3,355,203	11/1967	Stauffer	287—189.35
3,380,769	4/1968	Piget	287—189.36
3,416,271	12/1968	Heeney	52—476
3,428,326	2/1969	Clapsaddle	52—397

FOREIGN PATENTS

538,930	2/1956	Italy.
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MARION PARSONS, JR., Primary Examiner

U.S. Cl. X.R.

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