United States Patent

Skold

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[54] **SPACER CLIP FOR JOINING AND SUPPORTING CROSSWISELY EXTENDING REINFORCEMENT BARS**

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[52] **U.S. Cl.** **52/678,** 52/98, 52/685, 52/686

[51] **Int. Cl.**.....**E04c 5/20**

[58] **Field of Search**.....52/677, 678, 687, 689, 98, 52/684, 685, 686; 248/50, 54, 67.5, 68, 72

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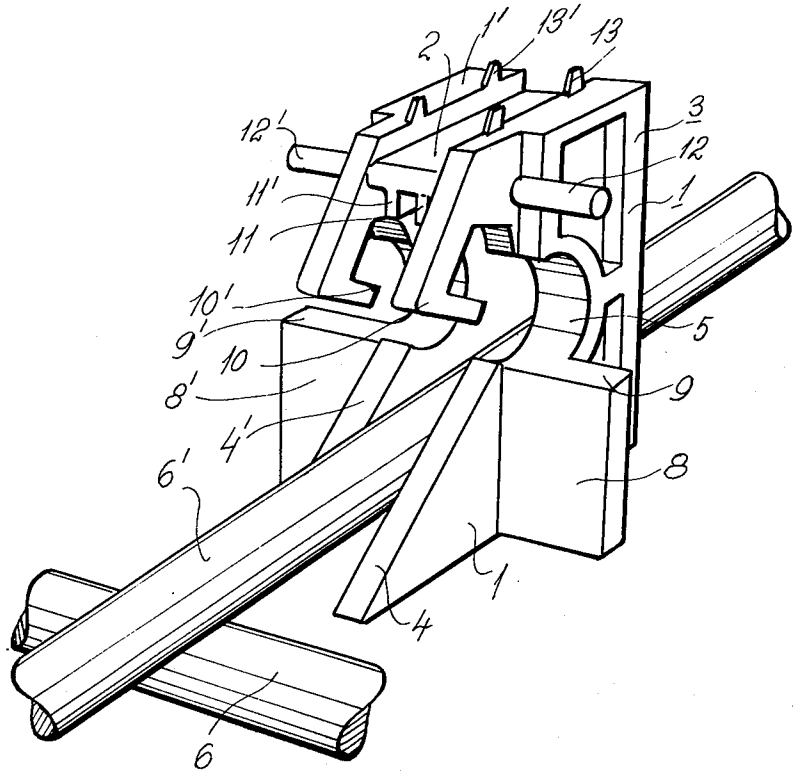
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[57] **ABSTRACT**

Spacer clip for joining crosswisely extending reinforcement bars at their intersections in preparation for casting concrete slabs and the like and supporting them in an elevated position spaced from the casting mold and which has a generally U-shaped body comprising arcuate recesses for receiving and resiliently retaining reinforcement bars of various sizes.

4 Claims, 5 Drawing Figures



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SHEET 1 OF 2

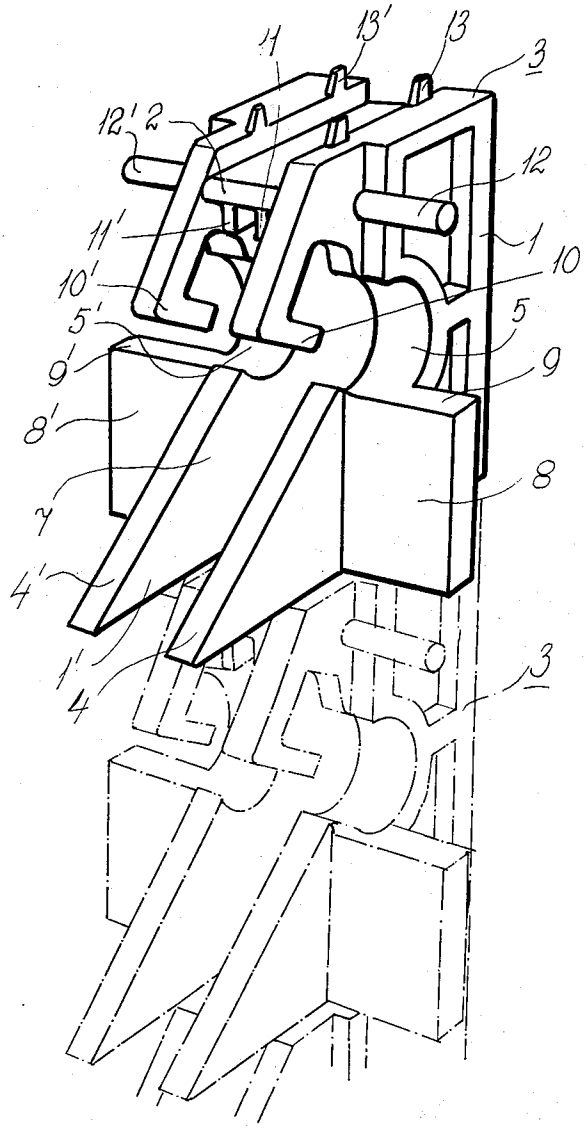


Fig. 1

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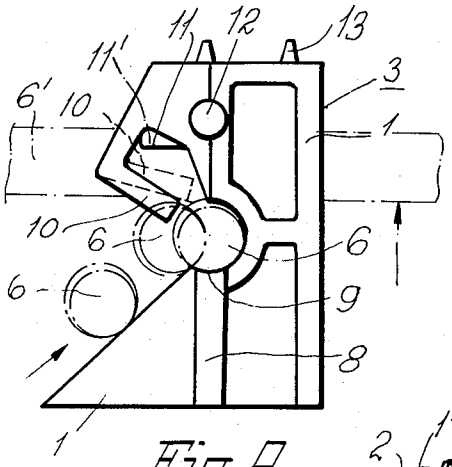


Fig. 2

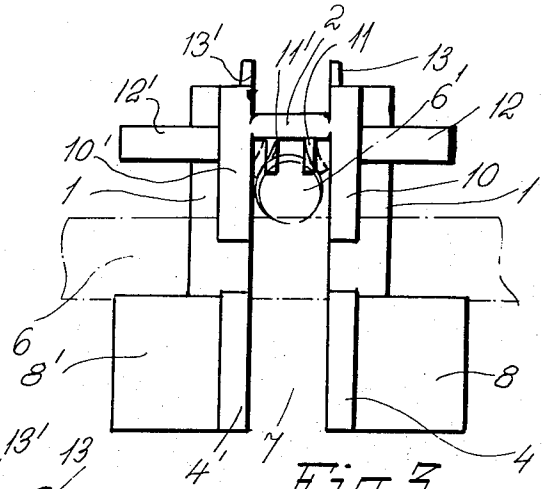


Fig. 3

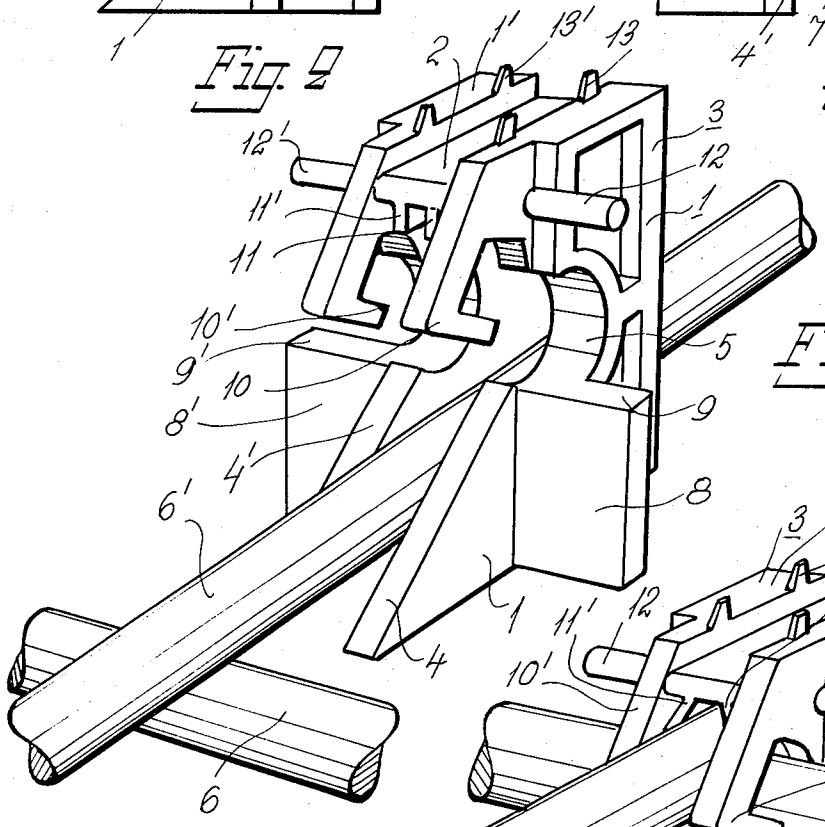


Fig. 4

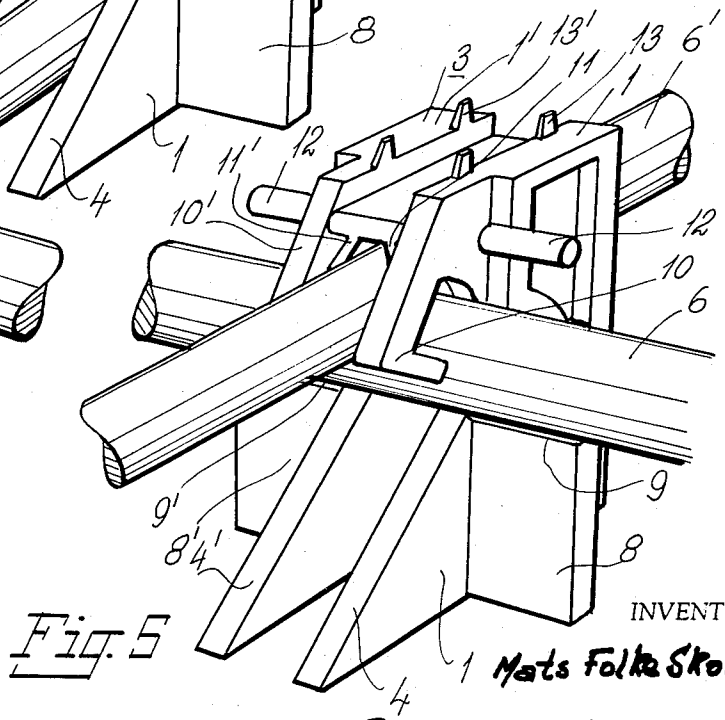


Fig. 5

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SPACER CLIP FOR JOINING AND SUPPORTING CROSSWISELY EXTENDING REINFORCEMENT BARS

BACKGROUND OF THE INVENTION

In the practice of casting concrete slabs and the like reinforcement bars of steel or other material are laid on the deck of the mold form in crosswise directions. In the past these reinforcement bars were tied together at their intersections by wire and raised above the deck by tying them to wire supports. For the purpose of alleviating the labor and reduce the installation cost, spacer clips have been used to replace the outmoded method of tying the reinforcement bars together by wire. An example of such spacer clip is shown in applicant's U. S. Pat. No. 3,461,536. It will be noted that such spacer clip not only ties the reinforcement bars together at their intersections, but also supports and secures them in place at a spaced distance from the mold. Therefore, this type of spacer clip provides support and stability for the reinforcement mat and working loads created by workmen on the project will not depress the spacer clip, such as is the case with wire supports. Thus, the desired concrete cover for the bottom of the slab to be poured is ensured.

The spacer clip may be applied manually to the reinforcement bars or by means of a tool as disclosed in applicant's U. S. Pat. No. 3,461,536. This tool comprises a magazine or a channel having an opening at the lower part thereof from which the spacer clips are ejected. The foot of the tool or gun is placed over two intersecting bars and when the clip is forced out from the magazine or channel by pressure exerted on the handles, the reinforcement bars are automatically locked into position spaced above the deck of the mold.

PURPOSE OF THE INVENTION

The primary object of the present invention is to provide a spacer clip which is an improvement of the spacing member shown and described in applicant's U. S. Pat. No. 3,461,536 which is restricted for application to reinforcement bars having the same size or diameter.

The major improvement according to the present invention contemplates the provision of a spacing member which can be used for reinforcing bars of various diameter or size, whereby the number of sizes of the spacer clips can be reduced considerably, with consequently reduced manufacturing costs, due to the fact that a smaller number of tools will be necessary for the manufacturing of the spacer clips.

A further valuable improvement resides in the fact that the spacing member, having been attached to the reinforcing bars, is effectively locked thereto which will prevent the spacing members from working loose from the reinforcing iron bars when the concrete is poured or subjected to traffic.

A further improvement resides in the fact that the spacing member with a spring action makes contact with the reinforcing iron bars, which will prevent creation of material stresses in the spacing member, which otherwise can cause the spacing member to crack under the mechanical stresses produced by the vibrating rod when pouring the concrete around the spacing members.

A further improvement of the spacing member resides in the fact, that it is manufactured from a flexible material, whereby the spacing member can be manufactured in one piece, without provision of special spring means to create the desired resilient contact with the reinforcing iron bars.

A further improvement of the spacing member resides in the fact, that it can easily be attached to the reinforcing iron bars manually without a tool, if necessary, since it is provided with flexible parts, which will permit the use of minimal manual power to fix the spacing member to the reinforcing iron bars. Thus, there is no necessity to squeeze or press the spacing member to the reinforcing iron bars since the spacing members will clip on to same without difficulty.

A further improvement of the spacing member is, that several spacing members are connected to each other in the shape of rods or cartridges in such a way that they can easily be separated from each other one by one either manually or with the aid of a separating device arranged in the tool.

A further improvement of the spacing member resides in the fact, that the reinforcing iron bar will receive a larger supporting surface directed towards the spacing member which will cause a safer fixing and better support of same at a suitable distance from the moulding form.

SUMMARY OF THE INVENTION

The spacing member according to the invention comprises two side members arranged parallel in relation to each other and joined together by means of a bridge piece, thus orming a generally U-shaped body in which an overlying reinforcing iron bar is insertable. The side members are provided with support legs protruding at a right angle from the free ends and with semi-circular recesses arranged above said support legs, in which a lower, crosswisely arranged reinforcing iron bar is insertable and characterized mainly by the fact, that the side members adjacent to the bridge piece are provided with spring fingers being intended to engage the reinforcing iron bar, thus forming a locking means.

The spacing member is further characterized by the fact, that the bridge piece is provided with two lugs parallel in relation to the side parts and directed towards the free ends of said side members, which lugs are adapted to resiliently engage the overlying reinforcing iron bar.

The spacing member is further characterized by the fact, that the protruding support legs are each provided with a support edge for the reinforcing iron bar.

An embodiment of the spacing member according to the invention will be further described below in connection with the enclosed drawings, in which:

FIG. 1 shows a perspective view of the spacing member and with an additional spacing member illustrated by dotted lines, said spacing members being connected to each other in the form of a rod or cartridge.

FIG. 2 shows a side view of the spacing member with the crosswise arranged reinforcing iron bars illustrated by dotted line during insertion into the spacing member.

FIG. 3 shows a vertical view of the spacing member as seen from the front with the crosswise arranged reinforcing iron bars illustrated by dotted lines.

FIG. 4 shows a perspective view of the spacing member when placed in a moulding form in which reinforcing iron bars are arranged crosswise.

FIG. 5 shows a perspective view of the spacing member, when placed in a moulding form and with the reinforcing iron bars fixed to the spacing member.

The side parts of the spacing member are indicated by 1 and 1', and are joined together at the top part by means of a bridge piece 2 at a distance from each other, thus forming a mainly U-shaped body, which is generally indicated by 3. The side parts 1 and 1' are arranged parallel in relation to each other and provided at the lower portion at a corresponding level with sloping or bevelled surfaces 4 and 4', which incline upwards and towards the center of the body. At the center portions of the side members 1, 1' at the top of the bevelled surfaces 4, 4', semi-circular recesses 5 and 5' are provided, in which a lower reinforcing iron bar 6 is insertable. An overlying reinforcing iron bar 6' which is crosswisely arranged in relation to the aforementioned reinforcing iron bar 6, is intended to be inserted from below in an upward direction in the space 7, said space having been created between the side members 1, 1'. The side members 1, 1' are provided at their lower ends with support legs 8 and 8' at a right angle to said side members, the top edges 9 and 9' of which provide support for the lower reinforcing iron bar 6. The lower edges of the support legs 8, 8' are connected at a corresponding level to the lower edges of the side members 1, 1', said edges being intended to make contact with the moulding form (not shown on the drawing).

The upper portion of the side parts 1, 1' are provided with hook shaped, spring fingers 10 and 10', the free ends of which are intended to engage a reinforcing iron bar 6 inserted in the recesses 5, 5' and lock same to prevent it from falling or slipping out of said recesses 5, 5'. Since the fingers 10, 10' are springy, reinforcing iron bars of various diameter can be inserted and locked in the recesses 5, 5'. The lower surface of the bridge piece 2 is provided with two flexible lugs 11 and 11', which are parallel in relation to the side members 1, 1'. Said flexible lugs 11, 11' are intended to engage the overlying reinforcing iron bar 6' and lock same to prevent movement. The flexible lugs will also permit reinforcing iron bars of various diameter to be effectively locked in the body 3. Guide pins 12 and 12' extend outwardly from the body, which are intended to engage in grooves positioned in the magazine of a tool for spacing members, as disclosed in applicant's U. S. Pat. No. 3,461,536.

The spacing members according to the invention are manufactured from synthetic plastic of a suitable degree of hardness. These plastic spacing members or spacer clips are molded into rods or cartridges comprising several spacer clips by means of frangible webs 13 and 13', which are easily broken, whereby the spacing members are easily separated from each other, either by means of a severing device in the tool or manually.

Due to the bevelled surfaces 4, 4' the spacing member can either manually or with the help of a tool be moved along the surface of a moulding form and thereby press the lower reinforcing iron bar 6 upwards and simultaneously the overlying reinforcing iron bar 6'.

Due to the spring fingers 10, 10' and the flexible acting lugs 11, 11' in combination with the upper level edges 9, 9' of the support legs 8, 8', an extremely stable fixing and support of the reinforcing iron bars 6, 6' is obtained, which will prevent the spacing members from movement or disengagement from the reinforcing iron bars 6, 6' when the concrete is poured or under the weight of people who must walk on the elevated reinforcing iron bars.

Since all elements of the spacing member consist of one unit of the same material and since several spacing members are molded into the shape of rods or cartridges comprising multiple clips, the manufacturing costs will be extremely low, and the packing and transport of same will be considerably simplified.

The spacing member according to the invention is not limited to the embodiment as described above and shown on the drawings and should, therefore, only be considered as a chosen example of the invention.

I claim:

1. A spacer clip of molded plastic resilient material for joining two crosswisely extending bars at their intersection and supporting and retaining them in a position spaced above a base, comprising:

a. a pair of vertically extending spaced leg members interconnected at the top by a bridging member extending generally horizontally to define an inverted generally U-shaped body adapted to receive the overlying one of the bars and having a bar engaging surface;

b. an open recess having a second bar engaging surface in each of said leg members for receiving and seating the underlying one of the bars, having its axis extending transversely to the axis of the bridging member, the bottom bar engaging surface of said recesses being spaced a distance from the bar engaging surface of the bridging member which is equal to or less than the combined thicknesses of the two bars;

c. a pair of flexible members each depending downwardly from said bridging member at a spaced distance from said leg members and said second bar engaging surface and having an end portion directed inwardly in opposite relation to said second bar engaging surface to permit said members to be flexed inwardly towards said recess;

d. said flexible members being spaced apart a distance substantially equal to the spacing between the leg members and adapted to engage the underlying one of the bars and to be deflected thereby upon the insertion of the bar in the recesses and spring back and secure said under-lying bar against said second bar engaging surface upon the seating of the bar.

2. A spacer clip according to claim 1 having flexible lugs depending from said bridging member for resiliently engaging the upper one of said bars.

3. A spacer clip according to claim 1 which includes frangible webs on the U-shaped body for interconnecting a plurality of severable clips during the molding operation.

4. A spring clip according to claim 1 in which the bottom ends of the side members have forwardly extending triangular members forming surfaces inclining upwardly to said recesses for engaging the lower one of said bars to facilitate the insertion thereof into the recesses.

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