June 19, 1923. 1,458,960

W. E. WHITE

BAR SPACER

Filed June 25, 1920

Fig. 2.

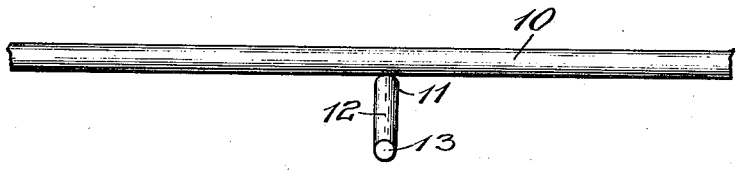


Fig. 3.

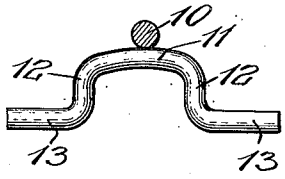


Fig. 6.

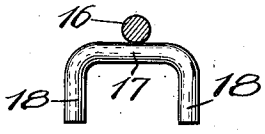


Fig. 1.

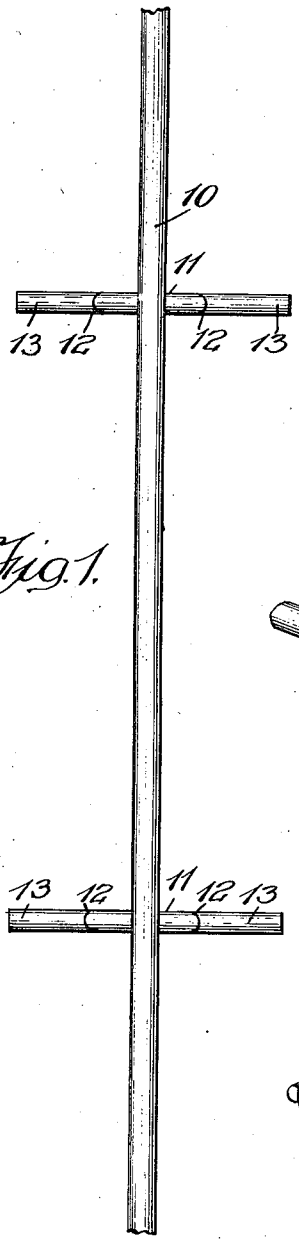


Fig. 4.

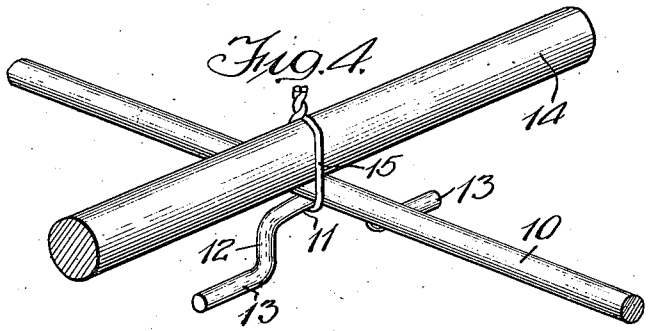
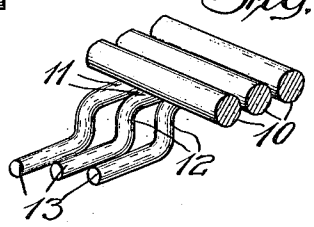


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM E. WHITE, OF CHICAGO, ILLINOIS.

BAR SPACER.

Application filed June 25, 1920. Serial No. 391,775.

To all whom it may concern:

Be it known that I, WILLIAM E. WHITE, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in a Bar Spacer, of which the following is a specification.

My invention relates to spacing devices and particularly to a novel bar spacer so constructed as to eliminate all unnecessary or non-essential elements. The objects and advantages of the new construction are many and a few thereof will be specifically pointed out.

It is well understood that the function of a spacing device is to provide means whereby successive reinforcing bars may be suitably spaced from each other, and from the form in which the concrete is moulded. As far as the spacing function is concerned the simplest form of a device for accomplishing the desired purpose would consist of a lightweight, continuous wire extending transversely of the reinforcing bars and providing a projection with which a bar fastening wire might cooperate. Such a projection might properly take the form of short lengths of wire welded at right angles to the spacing element, and on the opposite side from that contacted by the reinforcing bar.

In my construction I have utilized these simple elements and have extended the cross-wires downwardly to the required extent in order to suitably space away the reinforcing bars from the forms.

One of the principal advantages in the design herewith submitted is in that it provides a minimum of obstruction to concrete. There are no elements of the structure which form lines of cleavage such as occur where sheet metal strips are employed either for the spacer or for the chair.

Furthermore, one of the important points in the design of a spacing structure is to provide for maximum stability. These spacers are placed on relatively rough forms; they are liable to become more or less distorted in handling and unless they provide an ample spread for the legs the devices are likely to tip and be more or less unstable. This is a common objection made by practical men to the constructions now commonly in use. In my device I am able to obtain any desired spread, either by elongating the member which is welded to the continuous wire or by rebending the terminal portions of the legs to form feet.

The suggestion just made is important from another standpoint. An objection to the use of wire chairs has been that when the relatively sharp legs are mounted on the wooden forms, the weight of the bars and of workmen, who are inclined to step on the spacers during and after the placing of the steel, sometimes serves to drive the legs into the wood with the result that the spacing of the bar from the form is changed and the legs will project from the surface of the completed concrete after the forms are removed. By providing the feet referred to this tendency is overcome.

Another important advantage is in the ease with which the tie wires for securing the reinforcing bars to the spacers may be applied to the device here shown. The structure being open and the elements being of such small compass the wires may easily be located by the workmen, and it has been found in practice that it is as simple to apply separate wires to the device in the field as to utilize wires which have been associated with the spacer as it is manufactured.

One of the important reasons for the uniting of the elements by spot welding is in that the welding operation joins the parts so rigidly that I am enabled to use a single pair of legs, without danger of disengagement due to any tendency to failure by collapsing sideways of the legs.

By using wire for the different elements and by employing spot welding for uniting them I have great latitude in the selection of sizes or weights of wire without change of equipment. This is a substantial advantage over the use of sheet material in which changes in the dies must be made for all changes in gauge or size. Furthermore, it should be noted that there is no waste in the manufacture of the structure here shown.

One of the important considerations for

the design here proposed is in that the welding operation takes place at a point removed from any bend of the wire composing the lugs. In a construction in which chairs of V-shape are employed the welding operation takes place at the apex of the V, and the molecular change in the metal, due to the welding operation, together with the crystallization which commonly takes place as the result of a bending operation, produces a weak and uncertain joint. By forming the chairs of U-shape the right angled bends occur at a point removed from the junction of the line wire with the chairs and there is therefore no weakening effect produced.

A further advantage is in that the construction here shown permits of a maximum of efficiency in nesting and bundling. A plurality of spacers may be nested readily and a bundle formed which is substantially flat and easily handled. Other advantages will appear hereinafter.

The invention will be more readily understood by reference to the accompanying drawing in which:

Fig. 1 is a plan view of a section of a spacing element constructed in accordance with my invention;

Fig. 2 is a side view thereof;

Fig. 3 is an end view;

Fig. 4 is a perspective view;

Fig. 5 is a perspective view showing the ease with which the devices may be nested; and

Fig. 6 is an end view of a slightly modified form in which the feet are omitted from the legs.

In the drawings it will be seen that the device consists of but two essential elements; that is, the continuous unbent spacing wire 10, which may be of any desired weight or stiffness, and the chair element which is welded thereto. This consists of a transverse member 11, legs 12 and feet 13, the feet diverging and lying parallel with the cross-member 11. The legs are arranged in a plane transverse to the longitudinal axis of the spacing wire 10, and it will be seen, by reference to Fig. 3, that a maximum spread and stability of the chair is secured by the use of a minimum of material. An examination of the drawing, and particularly of Fig. 4, will show the ease with which a tie wire may be passed between the legs of the chair and bent upwardly, its ends being twisted above the reinforcing bar. Such a bar is indicated at 14 in Fig. 4, the tie wire, in place, being indicated at 15.

In the construction of Fig. 6 the continuous wire 16 is the same, and the chair consists of a cross-member 17 and legs 18, the feet being omitted. The cross-member may be made as long as desired, thus giving the required stability. In this construction the ends of the legs being of small area may be inclined to enter the forms under excessive pressure, but where this is objectionable such a design will be found to be effective. A construction such as here illustrated and described is of the utmost simplicity and presents many advantages in the economy of cost and simplicity of operation. The chair elements are manufactured rapidly and inexpensively on automatic machines, and the welding of the chairs and the wire is quickly performed in an ordinary electric welding machine. Modifications and variations in the construction shown may be made within certain limits and I do not wish to be restricted other than as indicated in the appended claims.

I claim:

1. In a spacing device, the combination of a single, continuous straight length of wire, and chairs also composed of wire, said chairs being of U-shape and having a relatively long horizontal base which extends transversely of said wire and which is welded to the wire at the middle portion of said base member, substantially as described.

2. In a spacing device, the combination of a continuous straight length of wire, and chairs secured to said wire at intervals, said chairs being composed of wire and being in the form of a U having vertical legs, the base member of the U extending at right angles to the wire and being welded thereto at the middle portion of the base member, substantially as described.

3. In a spacing device, the combination of a continuous, single straight length of wire, and chairs secured thereto at intervals, said chairs being composed of a substantially horizontal base member, vertical legs and horizontal feet, the base member being welded to the continuous wire at the middle joint of the base member, substantially as described.

4. In a spacing device, the combination of a continuous length of wire, and wire chairs secured thereto at intervals, said chairs being composed of a single section of wire bent to provide a horizontal member extending at right angles to said continuous wire, vertical legs and horizontal feet projecting laterally from said legs in line with said horizontal member, substantially as described.

5. In a spacing device, the combination of a continuous length of wire, wire chairs secured thereto at intervals, said chairs being composed of a single section of wire bent to provide a horizontal member extending at right angles to said continuous wire, vertical legs and horizontal feet projecting laterally from said legs in line with said horizontal member, and a tie wire extending diagonally

beneath the chair and continuous wire and adapted to be distorted around a bar resting thereon, substantially as described.

6. A structure as characterized comprising a plurality of wire chairs, said chairs being disposed in spaced relation and in alinement adapted for super-position upon the structural beams of a building; and a ridge wire permanently connecting said chairs for supporting the reinforcing metal used for flat arch construction, said ridge wire extending longitudinally from chair to chair.

Signed at Chicago, Illinois, this 19th day of June, 1920.

WILLIAM E. WHITE.