W. E. WHITE.

BAR SPACER.

APPLICATION FILED DEC. 22, 1919.

1,369,949. **Patented Mar. 1, 1921.**

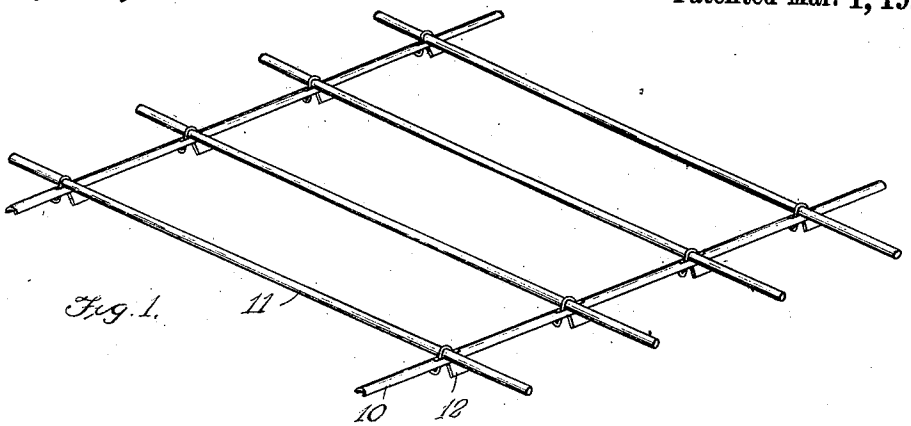


Fig. 1.

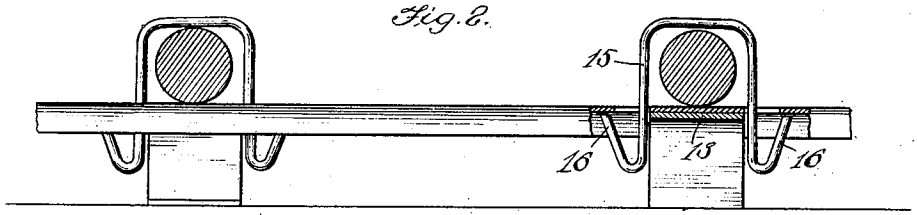


Fig. 2.

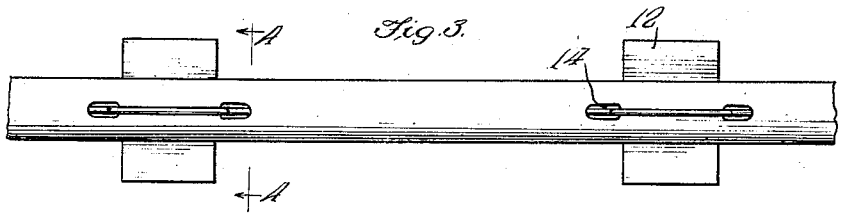


Fig. 3.

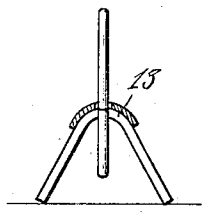


Fig. 4.

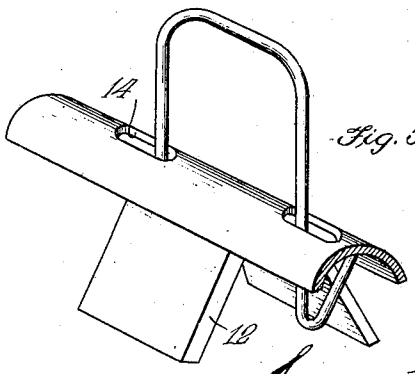


Fig. 5.

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UNITED STATES PATENT OFFICE.

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BAR-SPACER.

1,369,949. Specification of Letters Patent. Patented Mar. 1, 1921.

Application filed December 22, 1919. Serial No. 346,531.

To all whom it may concern:

Be it known that I, WILLIAM E. WHITE, a citizen of the United States, and resident of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Bar-Spacers, of which the following is a specification.

My invention relates to the art of concrete reinforcement and particularly to a novel spacer adapted to be employed for securing reinforcing bars in position prior to and during the operation of pouring concrete.

Recent development of reinforced concrete construction has brought forward a general demand for a device, specially adapted to automatically establish reasonably exact spacing for reinforcements, both as to spaced apart relations of rods, and as to spacing of the rods from the form to insure a specified fireproof covering.

Various solutions of this dual problem have been placed on the market, and apparently the most successful form of spacer thus far developed, is the type having integral projections which serve respectively as chairs and fastening ties. This device presents several objectionable features which have been avoided in my spacing bar and fastener.

In my construction I avoid cutting away any useful part of the spacing strip thereby preserving the full strength of the metal. Consequently I can employ metal of thinner gage and still be assured of ample transverse strength to resist hard usage in handling and the natural abuse to which the strips are exposed in the preliminary stages of assembly.

In my construction I provide a fastening device which may be applied without the arduous work of bending the stiff integral fastening projections which in the type heretofore referred to constitute the means for securing the reinforcing bar in position. Furthermore in my construction I provide a fastening device which permits of freedom of longitudinal movement of the reinforcing rod although it is securely locked against transverse movement. This is not possible in many of the constructions heretofore proposed because the fastening device, if securely applied, serves to hold the rod against any movement, and if adjustments are required it is necessary to loosen all of the fastening ties.

The spacing element is not intended to supply strength or to materially reinforce the concrete and therefore it should be composed of as light a material as is consistent to enable it to suitably perform its single function, that of spacing the reinforcing bars. To that end the spacing bar is made arcuate in cross-section, the curve being such as to utilize to the fullest extent the strength of the material employed. As a means for supporting the spacer in proper position above the form I provide chairs in the form of U-shaped members, the intermediate portion being curved to correspond to the curvature of the bar and secured thereto preferably by electric welding. These chairs may, if desired, be located directly beneath the reinforcing bars and thus perform their supporting function without assistance from the intervening portions of metal which constitute the spacing element. Preferably the legs of the U-shaped members will extend tangentially of the spacing bar, thus insuring adequate vertical and lateral strength notwithstanding the use of relatively thin gage metal.

A fastening device such as heretofore described as being desirable is in the form of a spring wire clip of U-shape having rebent ends, the material of the spacing bar being apertured at each side of the reinforcing bar. The apertures are of less length than the width of the rebent portions or hooks and the clips are therefore adapted to be sprung into place. When so positioned they are not readily removed.

The invention will be more readily understood by reference to the accompanying drawing, wherein,

Figure 1 is a perspective view showing the manner in which the spacing devices are employed;

Fig. 2 is a side elevation partly in section showing a fragment of a spacing bar and two reinforcing rods secured thereto;

Fig. 3 is a plan view of the construction shown in Fig. 2 with the reinforcing bars omitted;

Fig. 4 is a sectional view on line 4—4 of Fig. 3; and,

Fig. 5 is an enlarged fragmentary perspective view of the device.

In the drawings it will be seen that I pro-

vide a suitable number of spacing bars 10 adapted to coöperate with and suitably position the reinforcing bars 11. The spacing bar consists of a strip of light metal which is transversely bent to arcuate form, the gage of metal and the radius of bend being determined according to the stiffness required in particular cases. As a means for locating the spacing bars in proper elevated position above the forms I provide chairs which are in the form of U-shaped members having legs 12 and an intermediate portion 13 which is curved to fit snugly within the curve of the spacing bar 10. It will be noted that the legs 12 are flared and preferably project at a tangent from the arcuate bar thereby securing strength and rigidity with a minimum of metal. Preferably the reinforcing bars are placed directly above the chairs as shown, although this is not essential. When so placed the spacing bars are provided with elongated apertures or slots 14, one at each side of a chair, these being located at the apex of the curve of the spacing strip. At this point they have the least weakening effect. If desired these apertures may be provided throughout the length of the spacing strip thus making a standard spacer by the use of which bars may be positioned with any desired spacing.

As a fastening clip I provide a length of spring wire which is bent into generally U-shape thereby forming legs 15, the terminal portions 16 of which are rebent to form hooks. The span of the hooks at their ends is greater than the length of the elongated apertures 14 and, therefore, they must be compressed as the clip is forced into the position shown in Fig. 2. Preferably the clips are so bent that the sides are parallel and define a space substantially equal to the distance between two adjacent apertures. The space may be standard for certain sizes of reinforcing rods, a single size clip being adapted to hold a plurality of different sizes of reinforcing rods. A clip constructed as shown will accommodate a bar the transverse width of which is as great as the space between the legs of the clip. Thus the clip may be located without unnecessary distortion thereof, the only deflection or change in form being that which occurs when the hooks 16 are compressed as the clip is forced into position.

In order to summarize the points of advantage in the use of the construction heretofore described they will be briefly referred to:

First: The spacing member and chair support being shaped as shown give the greatest strength with the least metal.

Second: By employing a separate and simple fastening device I am able to provide a spacing member adapted to be nested and bundled, thereby permitting of easy handling of long sections without distortion in transit or in the field.

Third: The fastening device employed serves to eliminate a large amount of arduous labor and insures a more simple solution of the labor problem.

Fourth: By securely holding the bars against transverse movement, thus insuring a fixed relation of the bars and permitting of ready lengthwise adjustment.

Fifth: By providing a spacer which, when in final position on the forms prior to the location of the reinforcement, is relatively stable and which will be sufficiently strong to resist the distorting effect resulting from stepping on the placed spacers; furthermore which will be free from all projecting prongs which will be likely to catch on the shoes and clothing of the workmen and to engage with lumber and materials as they are being moved about or placed in position.

Obviously the construction is capable of some modification without departure from the spirit of my invention and I do not wish to be limited except as indicated in the appended claims.

I claim:

1. A spacing bar comprising in combination, a strip of metal transversely bent into arcuate form, chairs the upper ends of which are shaped to conform to said bar, the bar being apertured at intervals, and separable fastening clips adapted to engage the bar aperture to hold a reinforcing bar thereon, substantially as described.

2. In a spacing device, the combination of a strip of metal of curved cross-section and provided with elongated apertures therein, U-shaped chairs secured to said curved strip, and spring wire clips having means to engage said elongated apertures, substantially as described.

3. In a bar spacer, the combination of a strip of metal, chairs fitted and secured to said strip, the strip being apertured on opposite sides of each chair, and a spring clip having means to enter said apertures and engage beneath said strip, substantially as described.

4. A spacing device comprising in combination, a strip of metal of curved cross-section, a chair in the form of a U-shaped member having flared legs, the apex of the chair being curved to conform to the strip, the strip being apertured on opposite sides of the chair, and a spring clip provided with offset ends adapted to enter said apertures and engage beneath the strip, whereby to securely hold a reinforcing bar in position on said strip of metal, substantially as described.

5. In a spacing device, the combination of a bar bent transversely into an arc of a circle and chairs secured to said bar at in-

tervals, said chairs being formed from strips of metal, the intermediate portions of which are bent to conform to the curvature of the bar and the terminal portions which constitute the legs of the chair projecting at a tangent from the curved portion, substantially as described.

6. In a spacing device, the combination of a bar and legs for elevating the same, the bar being provided with apertures on opposite sides of the legs, and a fastening member in the form of a U-shaped wire clip having parallel sides, the ends of the side members being rebent outwardly, the width of the rebent portion being greater than the width of said apertures, whereby the rebent portions are compressed as they pass through the apertures and thereafter expand to underlie the bar, substantially as described.

7. In a spacing device, the combination of a bar bent transversely into an arc of a circle and chairs electrically welded to said bar at intervals, said chairs being formed from strips of metal, the intermediate portions of which are bent to conform to the curvature of the bar and the terminal portions which constitute the legs of the chair projecting at a tangent from the curved portion, substantially as described.

Signed at St. Paul, Minn., this 18th day of December, 1919.

WILLIAM E. WHITE.

Witness:
H. L. Dow.