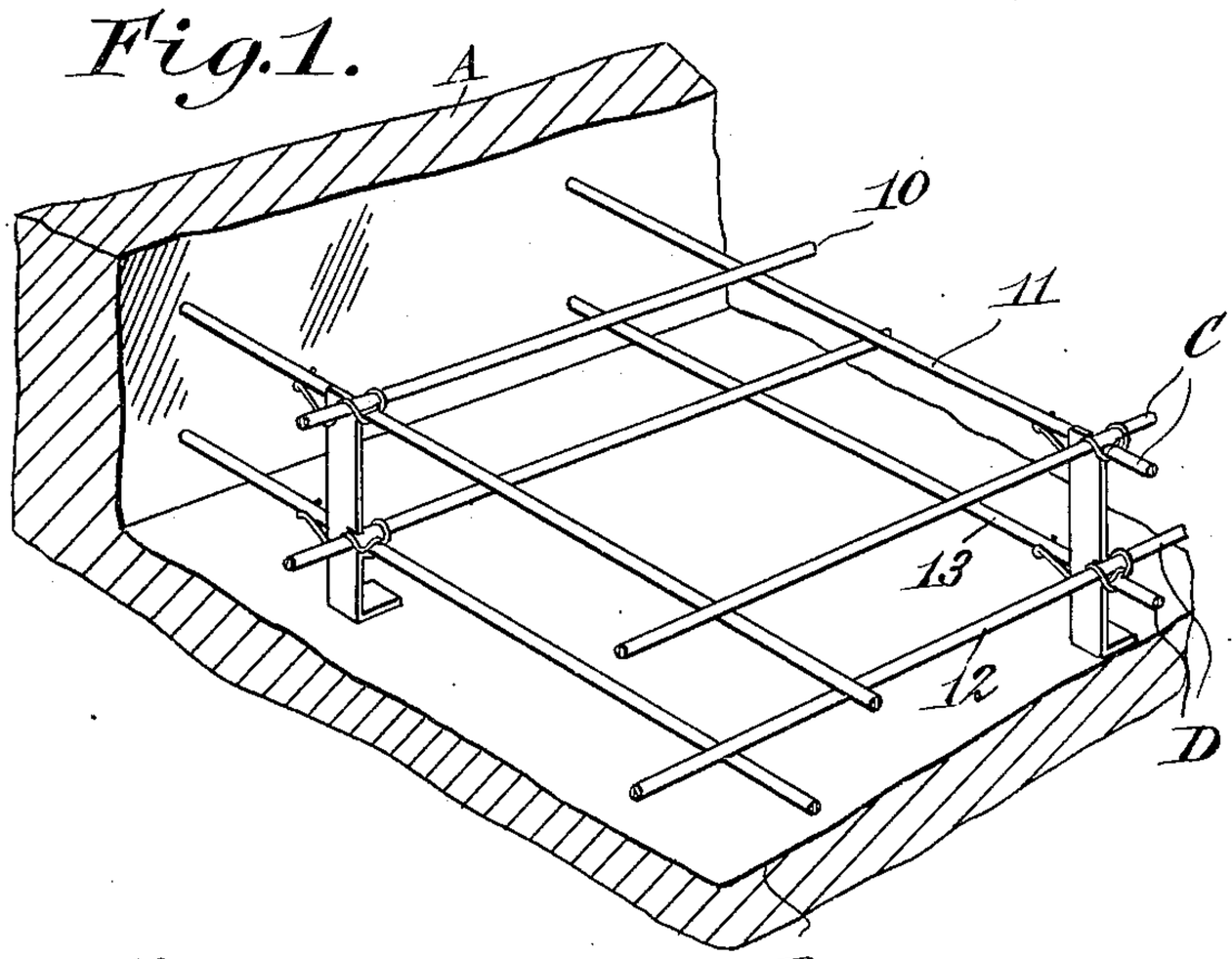
Dec. 8, 1931. R. C. OLMSTED ET AL 1,835,806

CHAIR AND SPACER FOR CONCRETE REENFORCEMENTS

Filed June 24, 1929

Fig. 1.



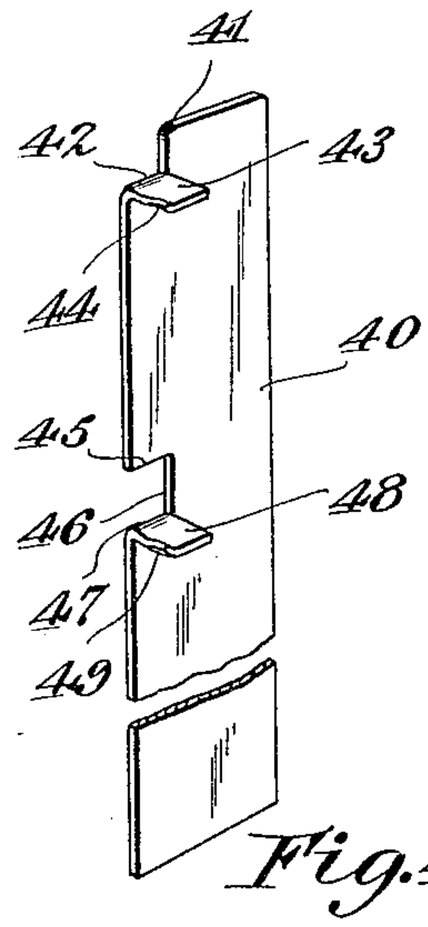


Fig. 4.

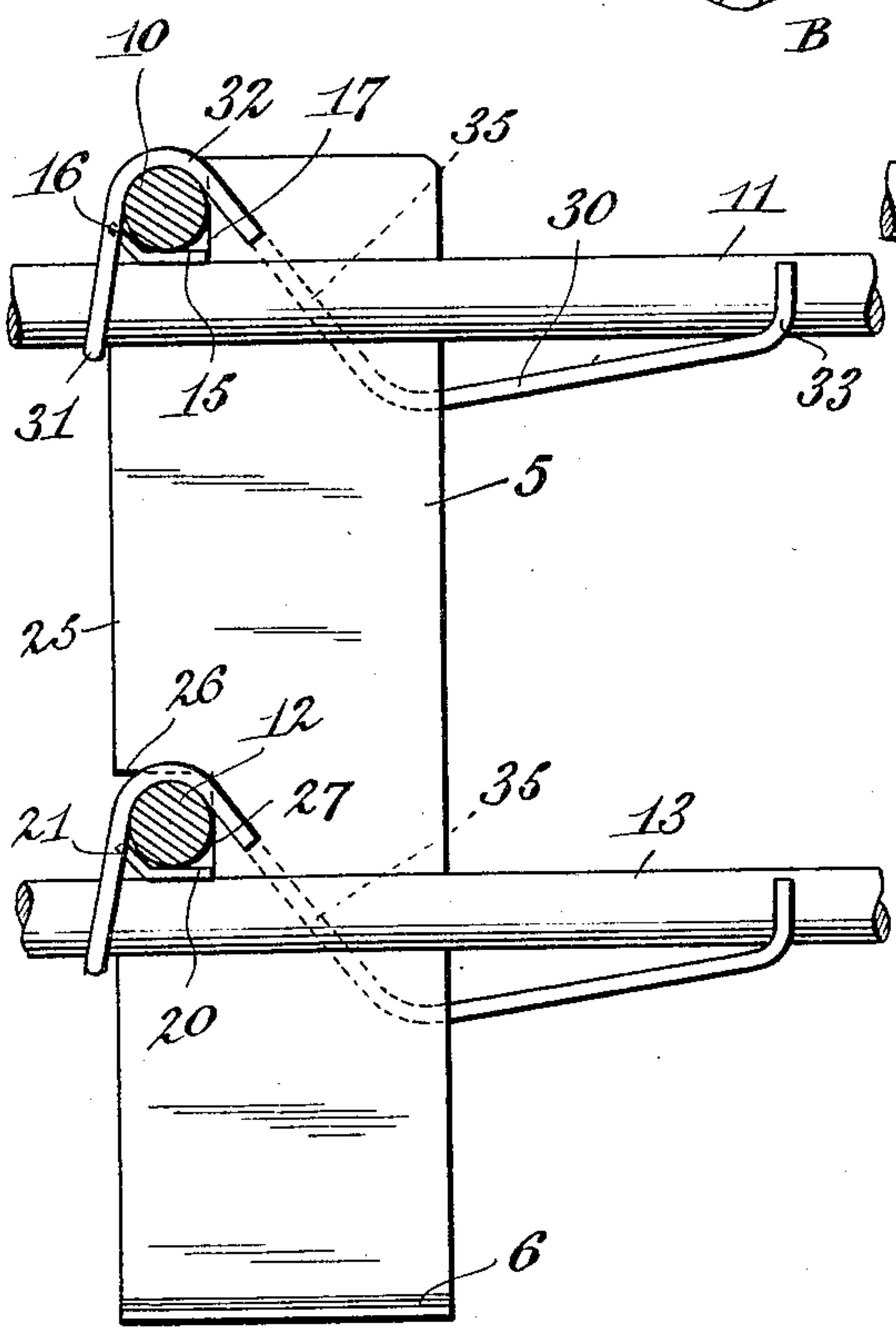


Fig. 2.

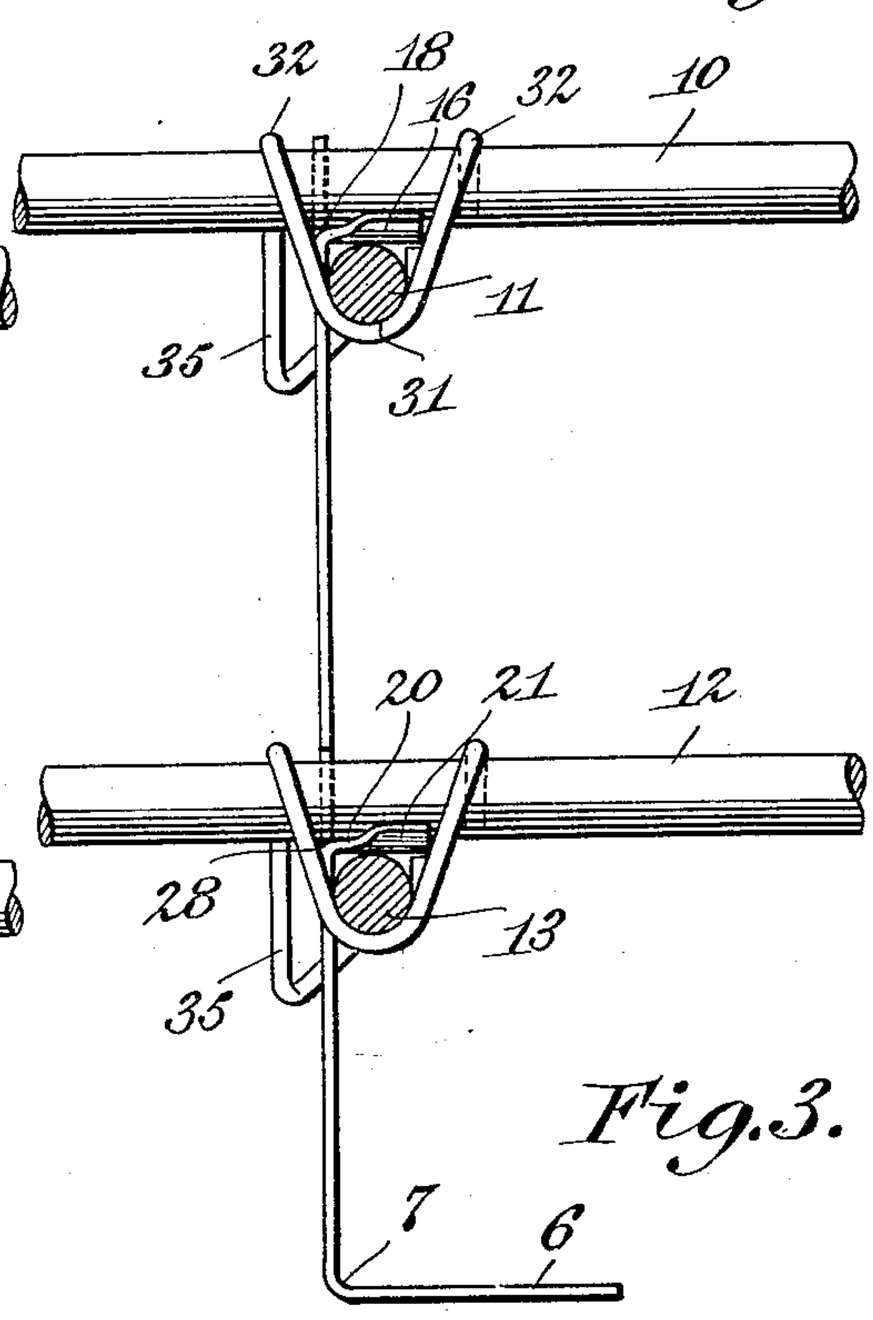


Fig. 3.

INVENTORS.
Russell C. Olmsted.
Edward D. Reed.
BY
Perry A. Pattison.
ATTORNEY.

Patented Dec. 8, 1931 1,835,806

UNITED STATES PATENT OFFICE

RUSSELL C. OLMSTED, OF HUDSON HEIGHTS, NEW JERSEY, AND EDWARD D. REED, OF PHILADELPHIA, PENNSYLVANIA; SAID REED ASSIGNOR TO SAID OLMSTED

CHAIR AND SPACER FOR CONCRETE REENFORCEMENTS

Application filed June 24, 1929. Serial No. 373,144.

The present invention relates to new and useful improvements in chairs and spacers for use in constructing reenforcing mats for concrete structures and while the invention herein illustrated is shown and described as used in the construction of concrete roadways it is to be understood that it is capable of use in other connections as well, such as reenforcements for concrete walls, curbing, foundations or any type of concrete construction which employs intersecting elements in the reenforcing structure thereof.

In the construction of concrete roadways it is preferable to employ two series of intersecting elements preferably, although not necessarily in the form of bars. The two series of intersecting reenforcing elements are spaced with respect to each other, thus forming a lower series and an upper series of intersecting elements when the reenforcing structure is in position in the roadway.

Devices known as chairs are employed for maintaining the upper and lower series of reenforcing elements in spaced relation and these chairs generally consist of an upright body member supported upon the sub-base of the road with the reenforcing elements supported thereon, together with means for tying or securing the reenforcing elements to each other and to the chair. It is desirable that these chairs be of more or less rigid nature and at the same time they should be relatively cheap of manufacture for the reason that they are used but once since they become a part of the reenforcing structure of the roadway.

In Patent No. 1,684,195, granted to Russell C. Olmsted, September 11, 1928, a reenforcing structure similar to that above described, together with a spacer for maintaining the upper and lower series in spaced relation, are used and it is in connection with reenforcing elements of the type shown in this patent to Olmsted that the device of the present invention is particularly adapted. While the device shown in the above-mentioned Olmsted patent is intended as a spacer it may be used as stated in said patent as a chair but when used in this particular connection the lower series of reenforcing elements rest practically upon the sub-base of the roadway and in some roadway constructions it is more desirable to space the lower series of reenforcing elements not only from the upper series of reenforcing elements but also from the sub-base of the roadbed and it is in connection with this last mentioned type of reenforcements that the device of the present invention is particularly adapted.

It is one of the objects of the present invention to provide a new and improved type of chair or spacing element which will support a plurality of series of reenforcing elements in spaced relation to one another and at the same time support the complete structure comprising the several series of reenforcing elements and particularly known in the art as a reenforcing mat, in spaced relation with respect to the sub-grade of the roadway.

It is a further object of the invention to construct a chair which may be used in combination with conventional types of reenforcing bars and bar ties, thus obviating the necessity of specially designing these elements of the reenforcing mat to meet a special form of chair and spacer.

It is a still further object of the invention so to construct and arrange the chair and spacer that the reenforcing elements of which the mat is comprised will be rigidly connected to each other and to the chair when the mat is assembled.

It is a further object of the invention to provide a chair which will facilitate the assembling of the mat on the roadway subgrade, thus making it possible when desired to assemble the mat in advance of a concrete laying machine and obviating the necessity of assembling the reenforcing mats at points remote from their use as is a common practice at present in the construction of concrete roadways.

With the above and other objects in view which will appear as the nature of the invention is more clearly understood reference is had to the accompanying drawings wherein is illustrated what may be at the present

time designated as the preferred forms of the invention and in which—

Figure 1 is a perspective view showing a reenforced concrete roadway broken away to show a reenforcing mat in which the chairs are constructed and arranged in accordance with the present invention;

Figure 2 is an enlarged detail view in elevation and partly in section showing the manner in which the reenforcing elements which form the mat are secured to the chair;

Figure 3 is a view similar to Figure 2, but taken at right angles thereto; and

Figure 4 is a detail perspective view showing a slightly modified form of the invention.

The spacer constructed in accordance with the embodiment of the invention illustrated consists of a body portion 5 and a base or foot portion 6. The body portion 5 is preferably of elongated form and the foot portion 6 is preferably of elongated form and the foot portion 6 is preferably formed integral therewith by bending the body portion transversely as indicated at 7 to provide the foot 6 in a plane substantially at right angles to that of the body portion 5.

Each series of reenforcing elements or bars comprises upper and lower bars and the lower bars of each series are preferably supported by suspending them from the upper bars of their respective series and the upper bars of each series are preferably supported directly by the chairs or spacers which in turn rest upon the sub-grade of the roadbed.

While in the foregoing, the elements which make up the mat have been described as in the positions which they occupy when they are assembled in the horizontal plane as in a roadway, it is to be understood that the terms "upper" and "lower" are only used for the purpose of illustration and description, and that when used in other connections, as in a wall structure, the mat would occupy a position in a substantially vertical plane and the upper and lower members would then become inner and outer members in the reenforcing mat structure. In any instance it is to be understood that the mat when assembled will comprise intersecting members in series and that one member of each series will be supported by the chair or spacer with the other member of each series supported from that member which is supported by the chair or spacer.

Referring to Figure 1, the roadbed is designated by the reference character A and the sub-grade thereof by the reference character B. The upper series of reenforcing elements is designated by the reference character C, the lower series being designated by the reference character D. The upper series of reenforcing elements comprises intersecting rods or bars 10 and 11, the rods or bars 10 being the upper elements and the rods or bars 11 the lower elements of the upper series. The lower series of reenforcing elements D comprises intersecting bars or rods 12 and 13, of which the bars or rods 12 are the upper elements and the bars or rods 13 are the lower elements.

As shown in Figures 2 and 3 the body portion of the chair is formed in its upper end with a supporting rest or seat 15 having a slightly turned up lip 16. The rest or seat 15 is preferably formed by slitting lengthwise the body portion 5 as indicated at 17 and bending along the line 18 to form the rest or seat 15 and the lip 16 is formed by slightly distorting the outer edge of said rest or seat 15 as shown. At a point intermediate the ends of the body portion 5 and in longitudinal alignment with the rest or seat 15 a second rest or seat 20 is formed and this second rest or seat 15 is provided with a turned up lip 21. The rest or seat 20 is formed by cutting the body portion transversely from the edge 25 as designated at 26 and longitudinally of the body portion as at 27 and bending the thus cut-out portion along the line 28. The lip 21 of the rest or seat 20 is formed in substantially the same manner as the lip 16 of the rest or seat 15, that is, by slightly turning the outer edge thereof upwardly as designated. The two rests or seats 15 and 20 are in alignment with each other so that in the set up structure the reenforcing bars or rods will be substantially in the same vertical plane which is considered a desirable feature in reenforcing mats of this character.

The reenforcing elements of the upper and lower series are secured together and to the chairs or spacers by elements 30 commonly known in the art as "bar ties" and in the present invention these bar ties in addition to securing the reenforcing elements of each series together and to the chairs or spacers also serve as means to prevent shifting movement of the elements of each series relative to each other and relative to the chairs or spacers in a manner which will be hereinafter specifically described.

Having described the several elements of the preferred form of the invention as illustrated herein, the manner of assembling the same will now be recited.

The upper members of each series are positioned upon the rests or seats 15 and are prevented from moving laterally therefrom by the upturned lip 16 thereof as more clearly illustrated in Figure 2. The lower members of the upper series are passed beneath the seats 15 and the looped ends of the bar ties 30 are engaged beneath said lower member as designated at 31 in Figures 2 and 3. The free ends of the bar ties pass upwardly around the upper members 10 of the upper series as indicated at 32 in Figures 2 and 3 and the free end of one of the legs of each of the bar ties is then engaged beneath the

under reenforcing element 10 of the upper series as indicated at 33 in Figure 2. These bar ties 30 are formed of resilient wire and while in the present instance the type of bar tie known as the "single" tie is shown it is obvious that bar ties of other types may be employed without departing from the spirit of the invention. With the upper series assembled as just described it will be obvious by reference to Figures 2 and 3 that the tension of the bar ties 30 is exerted to hold the upper reenforcing elements 11 to their rests or seats 15 while the lower reenforcing elements 10 of the upper series are suspended from the upper reenforcing elements 11 by means of the looped ends of the bar ties. As designated by dotted lines in Figure 2 the intermediate portion 35 of the bar ties extends downwardly upon the outside of the body portion 5 of the chairs and thus clamps the said body portion 5 of the chair between itself and its respective reenforcing element 10 and this structure prevents lateral movement of the reenforcing elements 10 while the lateral movement of the reenforcing elements 11 is prevented by reason of the lips 16 of the rests or seats 15 and the side wall extending vertically from the rests or seats 15. Longitudinal movement of the reenforcing elements 10 and 11 is prevented by reason of the pressure resulting from the tension exerted by the bar ties when they are sprung into position to retain the parts in operative relation.

The reenforcing elements of the lower series are positioned and retained in place in the same manner as that described for the upper series and the description of the manner of assembling and the manner in which they are retained in position is deemed unnecessary in view of that recited for the upper series since as heretofore stated, it is the same.

In the construction shown in Figure 4 which, as heretofore stated is a modified form of chair or spacer, the same comprising a body portion 40 cut longitudinally as at 41 and bent as at 42 to provide a seat 43 having a slightly upturned lip 44. The body portion 40 is further cut transversely as at 45 and longitudinally as at 46 and bent along the line 47 to provide a rest or seat 48 having an upturned lip 49. This portion of the chair or spacer shown in this figure is substantially the same as the corresponding portion of the chair or spacer described and shown in the preferred form of the invention. In this form however, a foot or support such as 6 in the preferred form of the invention, is not shown, and in use the chair or spacer merely rests upon its lower end. The method of assembling and use of the device shown in Figure 4 is similar in every respect to that of the device shown in Figures 1 to 3 and a further recitation thereof is deemed unnecessary in view of the foregoing description.

While it has not been shown in the accompanying illustrations it is obvious that the body portion may be provided with a longitudinal rib for the purpose of adding strength thereto or not as desired, and that other minor details of construction may be resorted to without departing from the spirit of the present invention.

While we have illustrated the invention in what may be termed its preferred forms we wish it understood that it may be executed in various other forms not herein illustrated but clearly within its scope, and we therefore wish it understood that all forms which fall within the purview of the appended claims are covered herein.

What is claimed as new is:

1. A reenforcing mat comprising in combination a plurality of chairs or spacers, each provided with a plurality of reenforcing-element supporting rests or seats in alignment with each other, a reenforcing element supported on each of said rests or seats, a reenforcing element positioned beneath each of said reenforcing element rests or seats and in intersecting relation with the reenforcing elements supported thereby, and means for clamping said reenforcing elements in engagement with opposite sides of the reenforcing-element supporting rests or seats for suspending the reenforcing elements which pass beneath the reenforcing-element rests or seats from the reenforcing elements supported thereon.

2. A reenforcing mat comprising in combination a plurality of chairs or spacers, each provided with a plurality of reenforcing-element supporting rests or seats in alignment with each other, a reenforcing element supported on each of said rests or seats, a reenforcing element positioned beneath each of said reenforcing element rests or seats and in intersecting relation with the reenforcing elements supported thereby, and means for clamping each of said reenforcing elements in engagement with opposite sides of the reenforcing-element supporting rests or seats for suspending the reenforcing elements which pass beneath the reenforcing-element rests or seats from the reenforcing elements supported thereon, said last mentioned means comprising a bar tie.

3. In a reenforcing mat for concrete structures, a chair or spacer, rests or seats for supporting intersecting reenforcing elements at two points of said chair or spacer with their points of intersection in alignment with each other, means for securing said intersecting reenforcing elements together with a portion of said chair interposed therebetween and means comprising a turned lip on said rest for preventing lateral movement of those re-

enforcing elements supported by said rest or seat.

4. In a reenforcing mat for concrete structures, a chair or spacer, rests or seats for supporting intersecting reenforcing elements at two points of said chair or spacer with their points of intersection in alignment with each other, means for securing said intersecting reenforcing elements together, and means for preventing lateral movement of those reenforcing elements supported by said rests or seats, said last mentioned means comprising integral upstanding portions formed on said rests or seats, with said rests or seats interposed between the intersecting reenforcing elements.

Signed at New York, in the county of New York and State of New York, this 5th day of June, A. D. 1929.

RUSSELL C. OLMSTED.

Signed at Philadelphia, in the county of Philadelphia and State of Pennsylvania, this 28th day of May, A. D. 1929.

EDWARD D. REED.