March 9, 1965 S. LARKIN 3,172,239

SPACERS USED ON REINFORCEMENT BARS IN CONCRETE CONSTRUCTION

Filed June 29, 1962

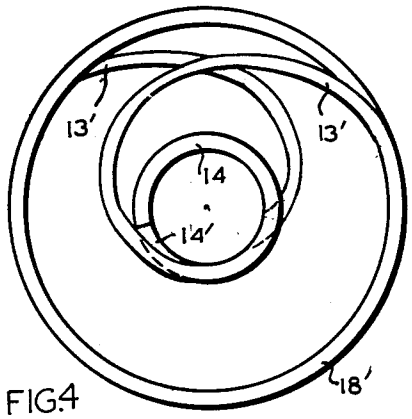


FIG.4

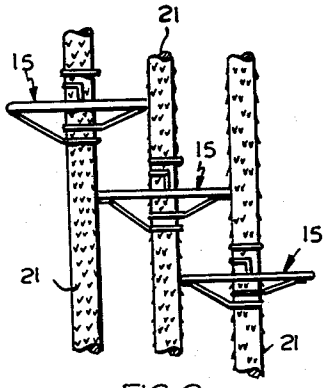


FIG.2

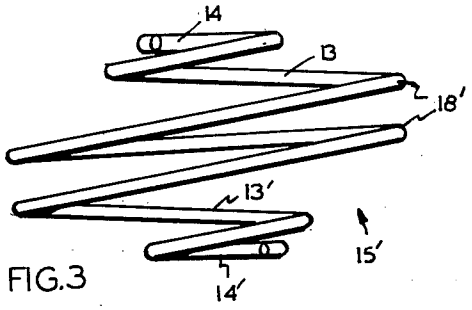


FIG.3



FIG.5



FIG.6

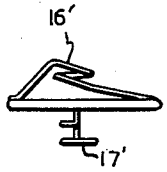


FIG.7

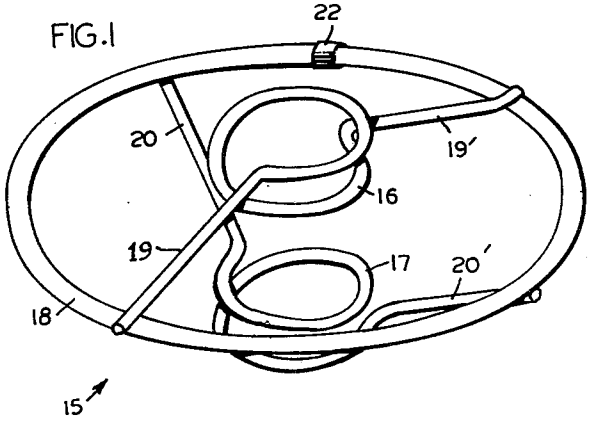


FIG.1

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SPACERS USED ON REINFORCEMENT BARS IN CONCRETE CONSTRUCTION

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The present invention relates to spacers for reinforcement rods used in concrete constructions.

It has been the practice heretofore to use a spacer which has a concrete annulus. These would be at spaced points along the rods and would act as though they were large stones in the concrete mass and therefore never homogeneous therewith. Other attempted spacer constructions created voids. In all previous trials, the spacers used impaired the total strength of the concrete construction.

It is therefore the principal object of this invention to provide novel and improved spacers of the nature set forth, which will avoid the foregoing objectionable features and which is light in weight, is easily mounted onto the reinforcement rods, will stay put where they are set and are easily adapted to fit tight on reinforcement rods of different diameters.

Another object thereof is to provide novel and improved spacers of the character mentioned which are made of wire stock and the like, reasonably cheap to manufacture and efficient in carrying out the purposes for which they are designed.

Other objects and advantages will become apparent as this disclosure proceeds.

For the practice of this invention, one form it may assume is to have a relatively thick wire formed into a circular ring with two aligned wire spring coils of one and a half turns each, concentric therewith; each of said coils being spaced from the ring's plane and to one side thereof respectively. Each of said coil at its ends, has an extension arm to said ring whereunto it is welded; the arms of each spring coil being in a diametral plane of said ring respectively and the plane of one pair of said arms being perpendicular to the arms of the second spring coil whereby a sort of four-spoke wheel structure is formed. The ends of the ring are preferably welded together. The said coils fit as collars on the reinforcement rod. Should the said rod be of a diameter smaller than the internal diameter of said coils, at least one of them may be distorted so that the spacer fits tightly.

For another embodiment, only one spring coil is used, with extensions from its ends to the ring, joined thereto by welding. Another embodiment is a one-piece construction.

The diameter of the rings, is chosen to give the required spacing between rods in an assembly.

I will now give a detailed description of such embodiments of this invention, for which I will resort to the accompanying drawing which is part of this specification. In said drawing, similar characters of reference indicate corresponding parts in all the views.

FIG. 1 is a perspective view of a spacer embodying the teachings of this invention.

FIG. 2 is an elevational view of vertically positioned reinforcement rods or a top plan view of horizontally positioned rods in an assembly equipped with spacers herein taught.

FIG. 3 is an elevational view of a spacer made of a single piece of wire in accordance with this invention,

FIG. 4 is a top plan view of FIG. 3.

FIGS. 5, 6 and 7 are elevational views of modified spacer constructions.

In the drawing, the spacer designated generally by the numeral **15**, comprises two aligned coil springs **16, 17** which are concentric with the ring **18** and positioned spaced respectively from the opposite sides of the ring's general plane. The ends of each spring has an integral extension to the ring, where they are welded thereto. The arms **19, 19'** extending from the coil spring **16** in opposite directions, are in a diametral plane. The arms **20, 20'** extending from the coil spring **17** in opposite directions, are in another diametral plane. Said planes are preferably perpendicular to each other whereby the spacer **15** is a sort of wheel structure with four equispaced spokes slanting from the coil spring they are part of, to the ring **18**. In this embodiment as shown, each coil spring has about one and a half turns, and may even be one or more turns with a single spoke to the ring as in FIG. 3. The diameter of these turns should be of internal dimension requiring slight force to be fitted on reinforcement rods **21** used in an assembly as shown in FIG. 2. The diameter of the ring **18**, and of the rings **18'**, is one that is suitable to attain the required spacing between the rods **21** and such is of course greater than the diameter of the coils' **16, 17** and the turns' **16', 17'** interiors. The ring **18** is of thicker wire stock than that of the coil springs, and its ends are preferably welded together as indicated at **22**. If a rod **21** is of a size which would fit loose through the coil springs, one of said coils may be distorted to make the spacer fit tightly, as for instance by making the coils to be out of alignment as shown in FIG. 7.

The spacer **15** is made of three pieces, the spacers of the FIGS. 5 and 6, of two pieces each, but the spacer **15'** is made of a single piece of wire, and instead of a spring coil at each terminus, same may be but a single turn as indicated at **14** and **14'** respectively, each with an arcual extension as **13, 13'** respectively to the large ring structure here offered by nearly two turns **18'**.

It is evident that the one-piece embodiment **15'** is extremely cheap, neads no assembly and those versed in the wire-working art will readily see that it can be made by automatic machine to form successively, two large turns **18'** and then two small turns and so on and to sever between the small turns.

In the modified constructions shown in FIG. 5 and FIG. 6 respectively, only one coil spring is used and same preferably is of quite a few turns as **23** and **24**; the difference between them being that spring coil **23** extends through the ring **18''** and for a distance at each side of the ring's general plane, while the coil spring **24** is to one side of such plane with respect to the ring **18'''**. In these modified forms, the distortion as shown in the FIG. 7 can be accomplished by shift of half of the spring with respect to the other half.

It is important to note that by the use of the spacers taught herein, in an assembly by reinforcement rods, the freshly mixed concrete or other stone composition poured to encase same, will have no voids or be contaminated by blocks or fill as was the objectionable experience with spacers heretofore.

In the appended claims, the term "coil" shall be deemed to comprise one of one or more turns.

This invention is capable of numerous forms and various applications without departing from the essential features herein disclosed. It is therefore intended and desired that the embodiments shown herein shall be deemed merely illustrative and not restrictive and that the patent shall cover all patentable novelty herein set forth; reference being had to the following claims rather than to the specific description herein to indicate the scope of this invention.

I claim:

1. A reinforcing rod spacer comprising a support engaging means and a reinforcing rod engaging means, said support engaging means comprising a closed circular wire ring member, said rod engaging means comprising a wire coil having at least one and a half turns between the ends thereof, the diameter of each turn being substantially the same and smaller than the diameter of said circular ring member, a substantially straight connecting element extending from each end of said coil at an acute angle with the longitudinal axis of said coil, the ends of said elements outwardly of said coil being attached to said circular ring member, said connecting elements extending from said coil in opposite directions and lying substantially in a diametral plane of said circular ring member, the longitudinal axis of said coil extending approximately perpendicular to a plane containing said circular ring member, said coil and connecting elements being formed of a single piece of wire.

2. A rod spacer as defined in claim 1, wherein both said ends of said coil are positioned on the same side of said plane containing said circular ring member.

3. A rod spacer as defined in claim 1, wherein said coil extends through said circular ring member.

4. A rod spacer as defined in claim 1, wherein said rod engaging means includes a second wire coil and connecting elements having the same configuration and formation as the coil and connecting elements first mentioned, the first and second coils and their respective connecting elements being on opposite sides of said plane containing said circular ring member with the connecting elements of the second coil being disposed in a second diametral plane which is perpendicular to the diametral plane first mentioned.

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