R. D. WEAKLEY.

BONDING MEANS FOR REINFORCED CONCRETE STRUCTURES.

APPLICATION FILED SEPT. 19, 1911.

**1,046,913.** Patented Dec. 10, 1912.

Fig. 1.

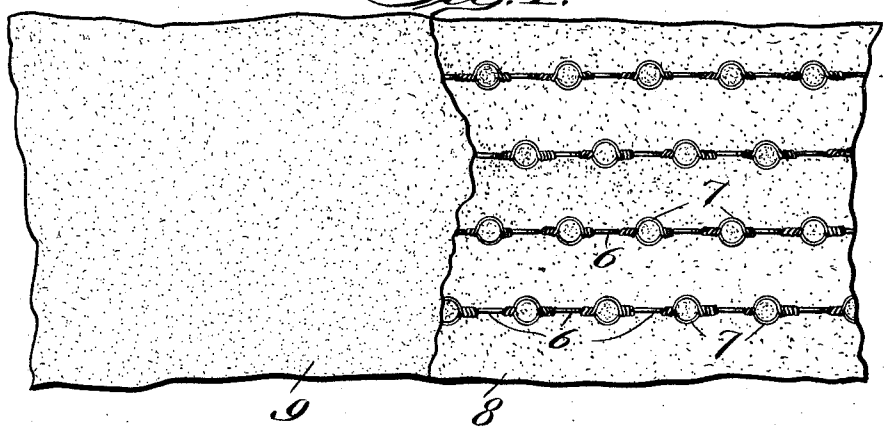



Fig. 2.

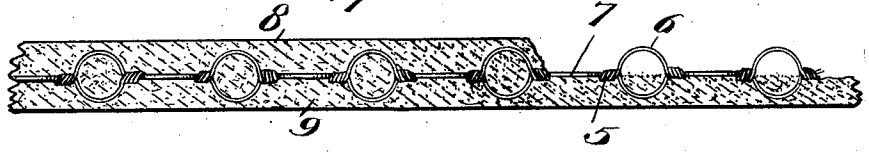
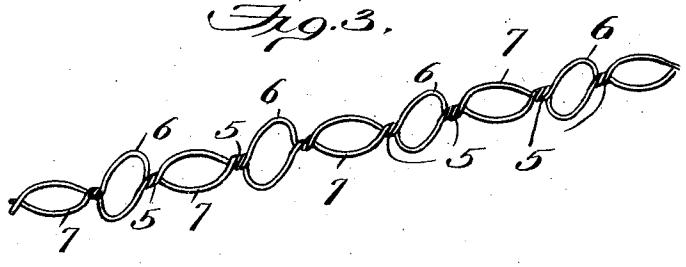



Fig. 3.

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# UNITED STATES PATENT OFFICE.

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## BONDING MEANS FOR REINFORCED CONCRETE STRUCTURES.

1,046,913. Specification of Letters Patent. Patented Dec. 10, 1912.

Application filed September 19, 1911. Serial No. 650,240.

*To all whom it may concern:*

Be it known that I, RAYMOND D. WEAKLEY, a citizen of the United States, residing at St. Louis, State of Missouri, have invented new and useful Improvements in Bonding Means for Reinforced Concrete Structures, of which the following is a specification.

This invention relates to bonding means for forming a reliable and strong and durable securement between lime and cement plasters and reinforced concrete surfaces which require plaster.

As well known, all reinforced concrete work is poured onto temporary molds or wood forms which consist chiefly of boards of suitable width and various lengths disposed as closely as possible but between the edges of which small cracks result.

This invention consists of connected wire loops of desired or preferred form arranged at angles to each other or alternately in vertical and horizontal disposition, the vertical loops, for instance, being pressed into the cracks between the edges of the mold or form boards up to the wire connecting means for said vertical loops, the horizontal loops preventing the wire connecting means from sagging into the cracks farther than is necessary in order that the plaster ceiling or other surface covering may be subsequently applied without having the depending or exposed projecting loops protrude beyond the finished surface. The horizontal loops also serve to hold the vertical loops in an upright position, and when the concrete is poured on the molding boards having the improved bonding means arranged therein the horizontal loops will resist the pressure that the very heavy concrete exerts by preventing the vertical loops from being forced beyond a predetermined distance into the cracks between the molding boards. When the molding boards are removed the applied concrete surface will show a great number of regularly disposed projecting loops which will form an effective holding means or bond for the plaster or analogous covering that may be subsequently applied to the concrete.

Other advantages and uses of the improved bonding means will be more fully hereinafter described, and for the purpose of demonstrating a practical form and application of the invention one form only of the bonding means is shown in the accompanying drawing, but modifications in the proportions, dimensions in general and the form of the loops in particular may be adopted within the scope of the appended claims.

In the drawing: Figure 1 is a plan view of concrete work and plaster covering or surface broken away and illustrating the application of the improved bonding means. Fig. 2 is a longitudinal section of the combined structure shown in Fig. 1. Fig. 3 is a detail perspective view of a portion of the bonding means.

The bonding means consists of a doubled or two wire strands twisted at intervals as at 5 to form loops 6 and 7 at angles to each other, the loops 6 being preferably at right angles to the loops 7. In practice the loops 6 will be disposed vertically and the loops 7 horizontally. The wire used in the formation of the bonding means may be of any suitable size and the loops 6 and 7 may be of any contour and dimensions. The length of the improved device may also be varied at will. The intermediate twists 5 also constitute retention means when the bonding means or strips are properly arranged on the molding boards.

The molding boards or planks are disposed as usual in forming concrete surfaces or structures and the bonding means then applied thereto with the loops 6 pushed or pressed into the cracks between the edges of the boards, the twists 5 resting over the cracks and preventing depression of the lower portions of the said vertical loops below or through to the opposite sides of the boards. In this position the horizontal loops 7 bear on the boards in flat condition. The concrete 8 is then poured onto the boards over the twists 5 and horizontal loops 7, and after the concrete has become sufficiently set, the boards are removed as usual and the said twists and loops 7 will be embedded in the hardened concrete and the loops 6 projected from the latter at regular intervals. When the plaster is applied several months or more after the molding boards or forms have been removed it will cover up the projecting loops 6 and produce a perfect bond to secure the plaster and the concrete surface, whether the latter be a ceiling, side wall or other surface. The portions of the vertical loops 6 above the twists 5 will be penetrated by the reinforced con-

crete or the latter will pass therethrough and the plaster surface, indicated by 9, will likewise penetrate and pass through the depending portions of the same loops and by this means a perfect key system will be provided with relation to the concrete and the plaster and the bonding means throughout the whole area of the concrete and plaster to which it is applied will be positively retained in position.

The improved bonding means may also be used for vertical partitions and columns wherever cracks appear or are formed between the molding boards, and, moreover, the said means may be used with any kind of plaster and reinforced concrete or to any plastic substance with which it is desired to use a bond.

The operation of applying the strands embodying the loops is very simple and does not require any skilled knowledge, it only being necessary for a laborer in applying the loops to set the first vertical loop of the series of each strand and then by means of a hammer strike the succeeding horizontal loop gently and force the vertical loop into place, this operation being continued until the strand is properly disposed.

The applications and possible uses of the improved bonding means are manifold and it is proposed to adopt the same in structures embodying any kind of surface or adjacent support, as for instance it is quite common for a brick veneer to be built beside a concrete wall, and the bonding means may be readily applied to this combination to perform the same function by increasing the size of the loops and spacing them a greater distance apart, the loops under these conditions being bent to come in proper contact with the joints between the bricks to form a perfect bond between the reinforced concrete wall and the brick veneer. Another advantage in the use of the improved bonding means is that the loop system when used in a basement ceiling in reinforced concrete buildings will provide a convenient and positive means for hanging hot water, steam, gas and electric conduit pipes, as the latter can be suspended by wires or other means fastened to the loops and thereby avoid the use of the expansion bolt system of hangers for pipes and the expense attendant upon the said bolt system without in the least depreciating the support and retention of the said pipes in their applied position.

In all applications of the improved bonding means it will be understood that the horizontal loops are the essential controlling means in regard to exact position and depth of the vertical loops protruding from the concrete structure or other plastic material in which the strips are embedded.

What is claimed is:

1. The combination with a reinforced concrete structure and a surfacing means, of a bonding means consisting of a wire strip having individual loops at one angle solely embedded in the concrete structure and loops successively disposed at right angles to and separated from the former loops and partially embedded both in the concrete structure and the surfacing means, the successive loops being separated by longitudinally straight rigid portions which are also held in the concrete structure.

2. As an improved article of manufacture, a bonding strip for reinforced concrete structures and surfacing means coöperating therewith, having a plurality of individual loops successively arranged in planes at right angles to each other and connected by longitudinally straight twisted portions, the loops in the same plane comprising a set, the one set of loops projecting above and below the remaining set and all of the loops having a regular projection and of similar dimensions.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

RAYMOND D. WEAKLEY.

Witnesses:
AUGUSTA SIMPSON,
WALTER P. BLUM.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."