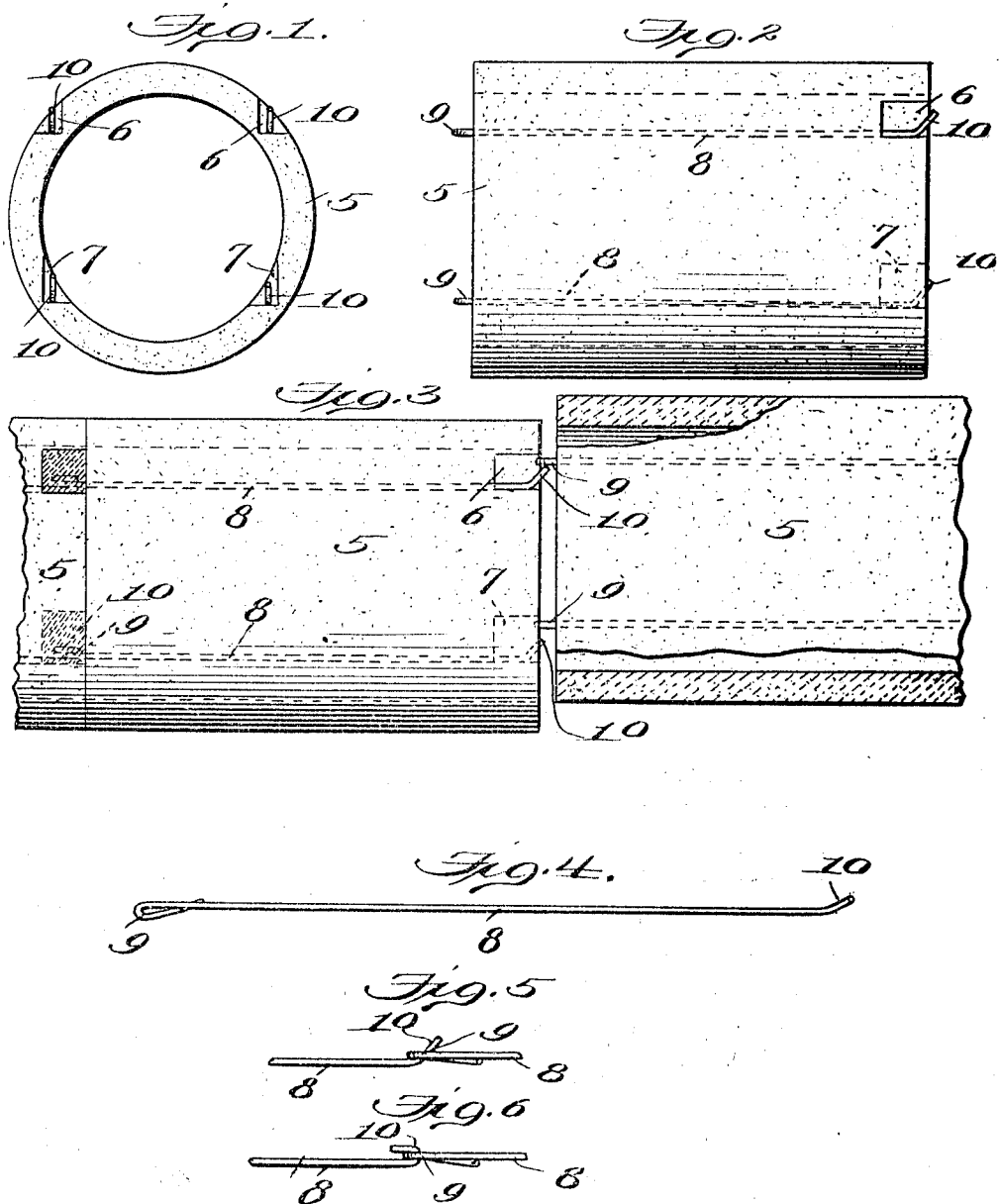


J. GILLIGAN.
CONCRETE CONSTRUCTION.
APPLICATION FILED JAN. 27, 1912.

1,055,162.

Patented Mar. 4, 1913.



Witnesses:
Chas. E. Hoyer

Inventor
John Gilligan
by *James L. Morris*
Att'y

UNITED STATES PATENT OFFICE.

JOHN GILLIGAN, OF LINCOLN, NEBRASKA.

CONCRETE CONSTRUCTION.

1,055,162.

Specification of Letters Patent.

Patented Mar. 4, 1913.

Application filed January 27, 1912. Serial No. 673,863.

To all whom it may concern:

Be it known that I, JOHN GILLIGAN, a citizen of the United States, residing at Lincoln, in the county of Lancaster and State of Nebraska, have invented new and useful Improvements in Concrete Construction, of which the following is a specification.

This invention relates to reinforced concrete constructions, and more particularly to a series of concrete sections arranged end to end and joined or connected through the medium of metal bars embedded therein and having their presented terminals inter-engaged, the said bars constituting not only the requisite reinforcements for the sections, but also the means whereby the sections are united to form a complete structure. The difficulty in effecting the connection of sections in a positive manner has been due in a large measure to the inability to take up the movement or play between the ends of the bars when the latter are loosely coupled, or for obtaining a close abutting relationship between the contiguous ends of adjacent sections, and consequently it has been usually necessary to employ an additional connecting means in the nature of a grout or joint of concrete interposed between the section ends, thereby increasing the time and expense of joining the section ends.

The present invention is intended to completely obviate the defects heretofore encountered in connecting concrete sections by using metal bars which are particularly constructed to insure a tight jointure between the same and the ends of the sections to which they are applied by a simple operation, and when employed in connection with pipe sections to provide a smooth surface and flow line on the interior of the pipe and thus minimize the cost of manufacture and produce a superior association of the sections.

It will be understood that the invention may be applied to either pipe sections or blocks, the accompanying drawing illustrating one practical application of the invention and showing the same applied to pipe sections.

In the drawing: Figure 1 is an end elevation of a pipe section embodying the features of the invention. Fig. 2 is a side elevation of the same showing parts in dotted lines. Fig. 3 is a side elevation partially broken away and in section, showing pipe sections

or members associated in terminal relation and illustrating the mode of assembling the bars or rods and securing the latter and the several pipe sections or members. Fig. 4 is a detail view of one of the bars or rods. Fig. 5 is a detail view illustrating the first step in securing or connecting the contiguous ends of the bars or rods. Fig. 6 is a detail view showing the connection of the bars or rods completed.

The numeral 5 designates the pipe section or concrete member having at one end upper and lower pairs of angular recesses 6 and 7, the upper pair of recesses 6 opening out through the end of the section and also through the outer surface of the latter and the lower pair of recesses 7 opening outwardly through the end and through the inner surface of the pipe or section. Pairs of bars or rods 8 are embedded in the upper and lower portions of the section or pipe 5, the said pairs of bars being arranged parallel and the lower pair in vertical alinement with the upper pair, the said pairs of bars reinforcing the concrete construction or the section or pipe 5 at points above and below the center of the latter or on opposite sides of the center of the same. Each bar or rod is formed at one end with a loop or eye 9 and at the opposite end with an up-turned or angularly directed terminal 10, the bars or rods being so disposed in the section or pipe 5 that all of the loops 9 will be equally projected from one end, as clearly shown by Figs. 2 and 3, and the upwardly inclined terminals 10 exposed within the upper and lower pairs of recesses 6 and 7 to enter or engage the loops or eyes 9 projecting from the end of a contiguous section or pipe 5.

In assembling the sections or pipe members 5 the one section is slightly elevated with relation to the end of the adjacent section so that the projected loops 9 at the end of the raised section are over the angular terminals 10, and the latter are then forced or guided through the eyes 9 when the raised section is gradually lowered, and when the sections are thus positioned they will be in longitudinal alinement and the angular terminals 10 are bent over into hook form, as shown by Fig. 6, the said terminals being readily accessible through the medium of the recesses 6 and 7. When the angular terminals 10 have been bent over in hook form as just explained and

shown particularly by Fig. 6, the end surfaces of the sections or pipe members 5 will be brought into close engagement and positively secured against movement in view of the provision of the upper and lower pairs of bars or rods 8. It is preferred in many instances to heat the angular terminals 10 prior to bending the same, the heating operation being carried on by any suitable form of torch or other means; and it is obvious that the heating operation will slightly elongate the bars and when the latter cool and contract, the sections or pipe members will be more positively drawn together in tight engagement. The terminals 10 may be readily reached through the medium of the recesses 6 and 7, and after the ends of the terminals have been bent over into hook form the recesses 6 and 7 are filled or closed with concrete or grout and a smooth joint will thus be provided or a smooth surface and flow line on the inside of the pipe is insured. It is preferred that the bars or rods 8 be formed of steel of suitable gage or in proportion to the dimensions of the sections or pipe members or other concrete constructions in which the said bars or rods are embedded.

The operation of connecting the ends of the sections or pipe members 5 by the improved bars or rods as explained may be expeditiously carried on and the expense incident to the jointure in accordance with the features of the invention is reduced to a minimum, and consequently the cost of manufacture is proportionately decreased. It will be understood that the concrete or other material used for filling the recesses 6 and 7 will be in plastic condition so that it can be readily poured into the said recesses, and upon hardening this concrete forms keys which positively preclude any displacement of the locking devices and the component sections of the finished monolithic structure are thus permanently and rigidly locked.

The stock from which the bars or rods 8 are formed may be readily obtained in the market, and it is preferred that rounded bars be used and thereby the initial cost of the same is considerably less than flat bars or strips and said round bars may be shipped in a raw state from the mills or other place of manufacture and the sub-

sequent bending of the strips as hereinbefore specified may be readily accomplished at slight cost.

What is claimed is:

1. A concrete structure comprising members having pairs of recesses extending only a short distance circumferentially of the members to form pockets, the one pair of recesses opening outwardly through the outer surface of each member at opposite points and the other pair of recesses opening inwardly through the inner surface of the member, the recesses of each pair and the pairs of recesses being separated from each other by the material of the member, and pairs of reinforcing bars disposed longitudinally in the members and having loops at one end projected beyond the end of each member and normally inclined terminals at their opposite ends disposed in the said recesses for engagement with the loops of similar bars of a contiguous member, the said inclined terminals of the reinforcing bars being bent downwardly over the loops into the recesses after the members are associated.

2. A reinforced concrete construction consisting of a plurality of sections or members each having at one end distinct pairs of recesses above and below the horizontal diameter of the section or member, the one pair of recesses opening through the outer surface of the section and the other pair of recesses opening through the inner surface of said section, the recesses being separated from each other and the pairs of recesses similarly separated by the material of which the section is formed so as to make distinct pairs of pockets, and pairs of reinforcing bars embedded in and extending longitudinally with relation to the sections, the pairs of bars being projected beyond one end of each section to engage the ends of bars of a contiguous section lying within the recesses to positively connect the bars of the several sections.

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

JOHN GILLIGAN.

Witnesses:

C. K. WARD,
F. P. HALEY.