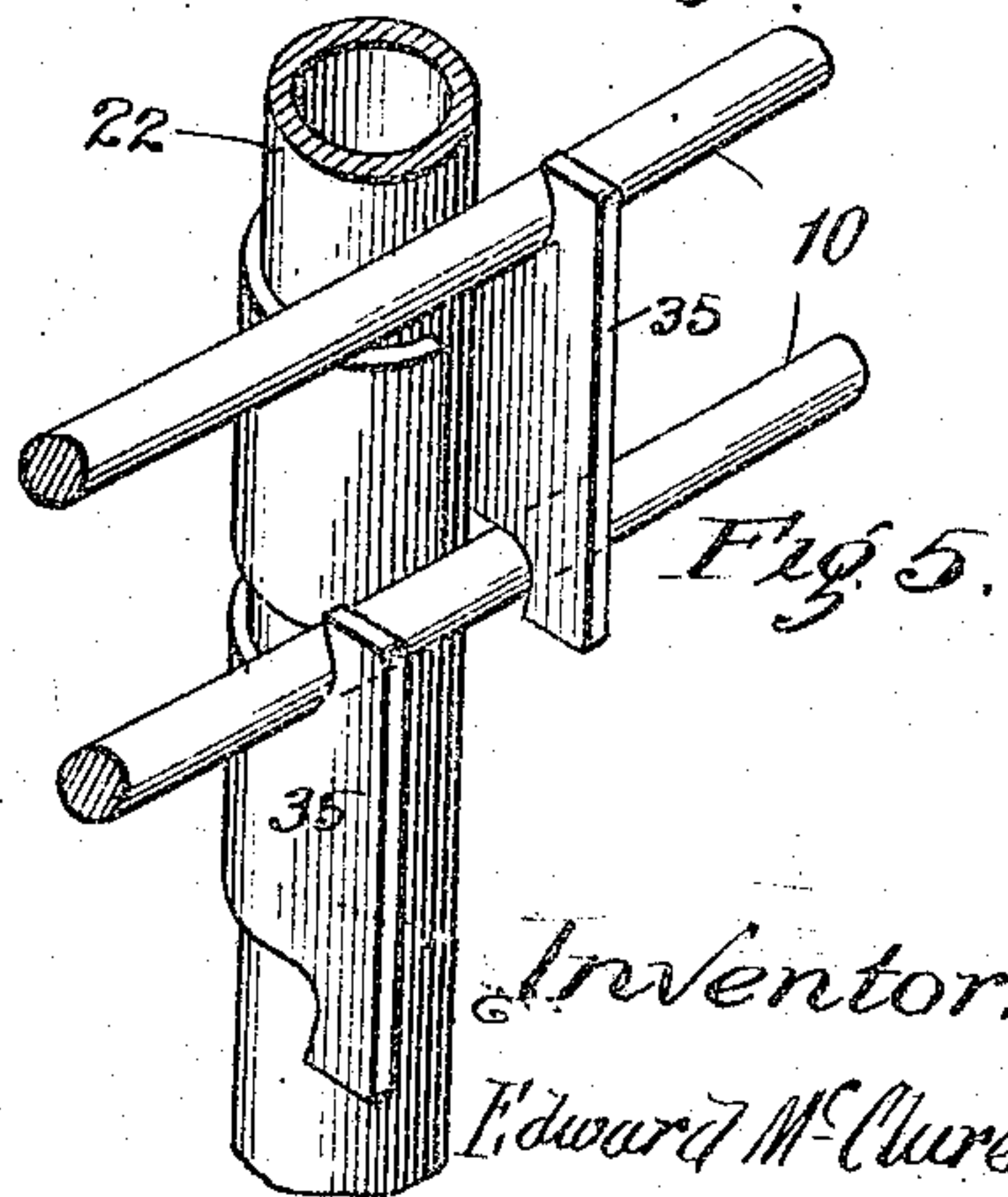
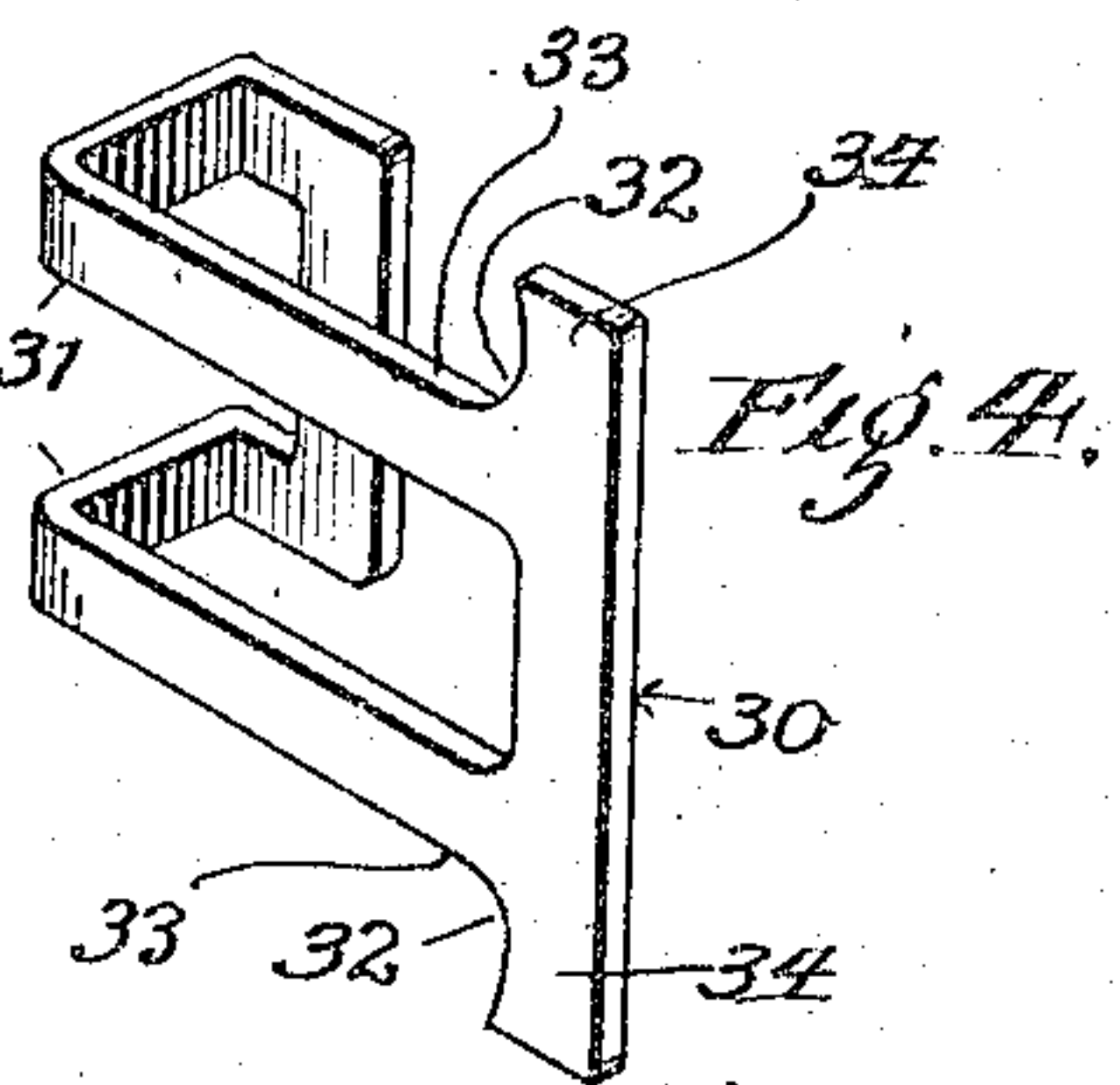
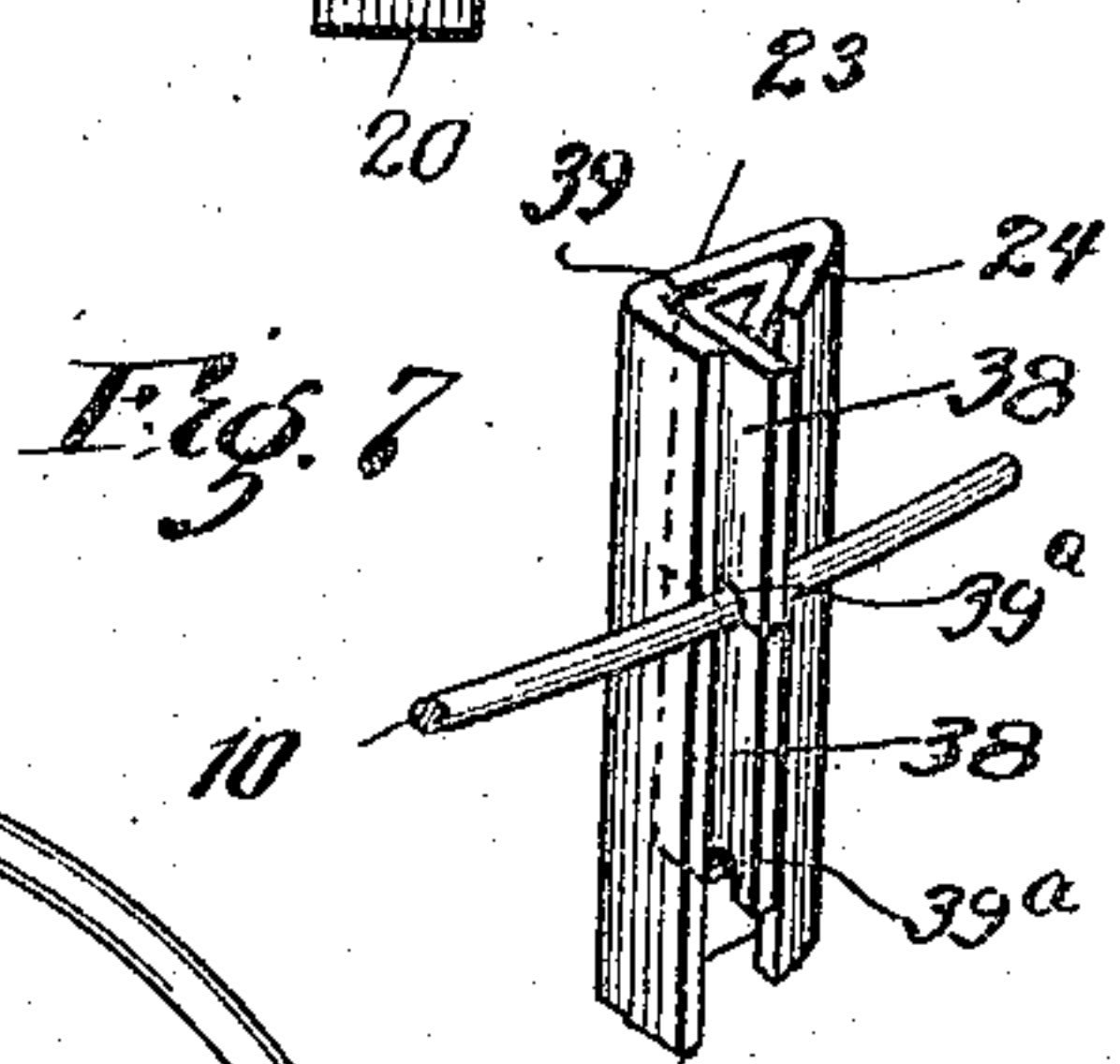
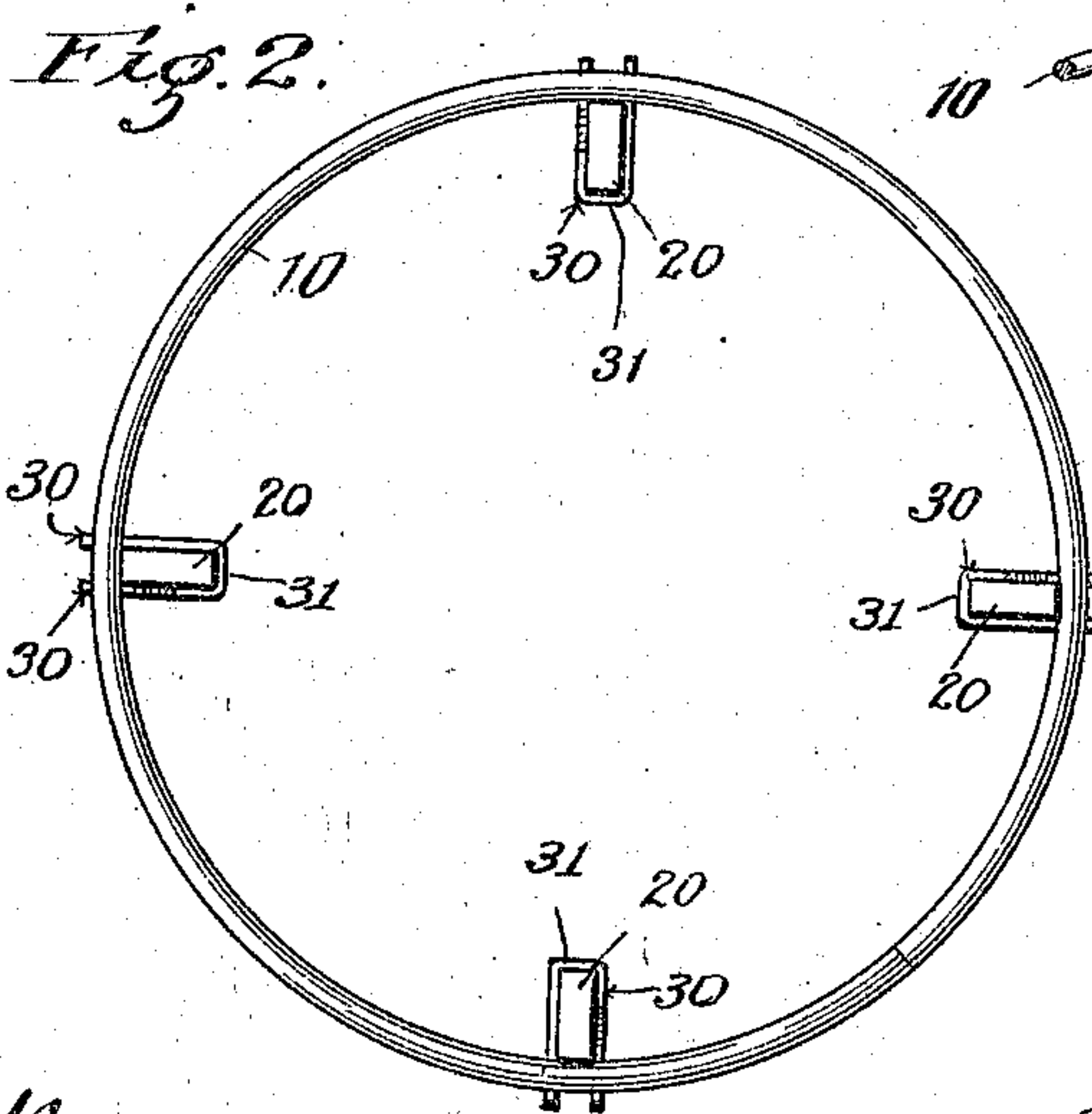
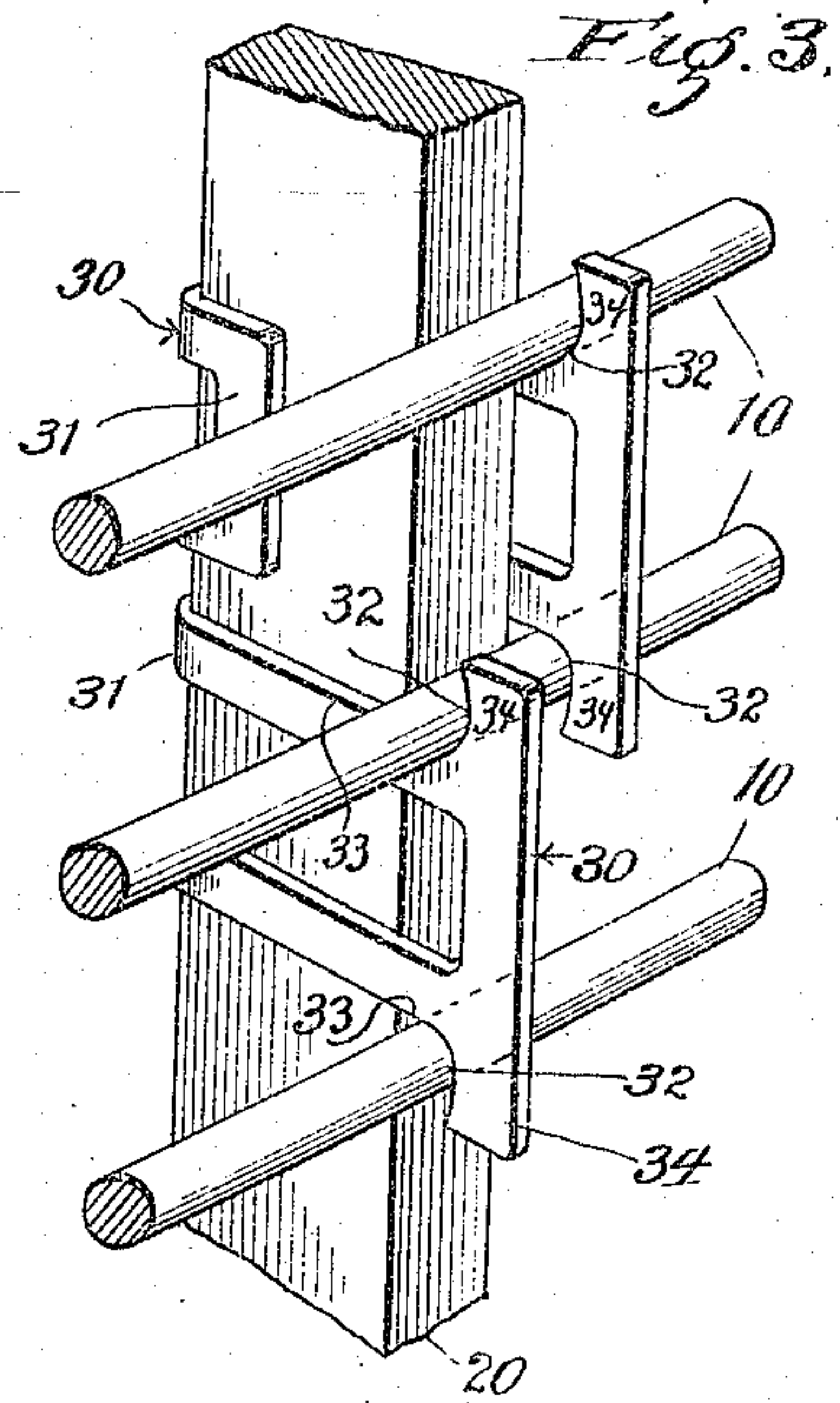
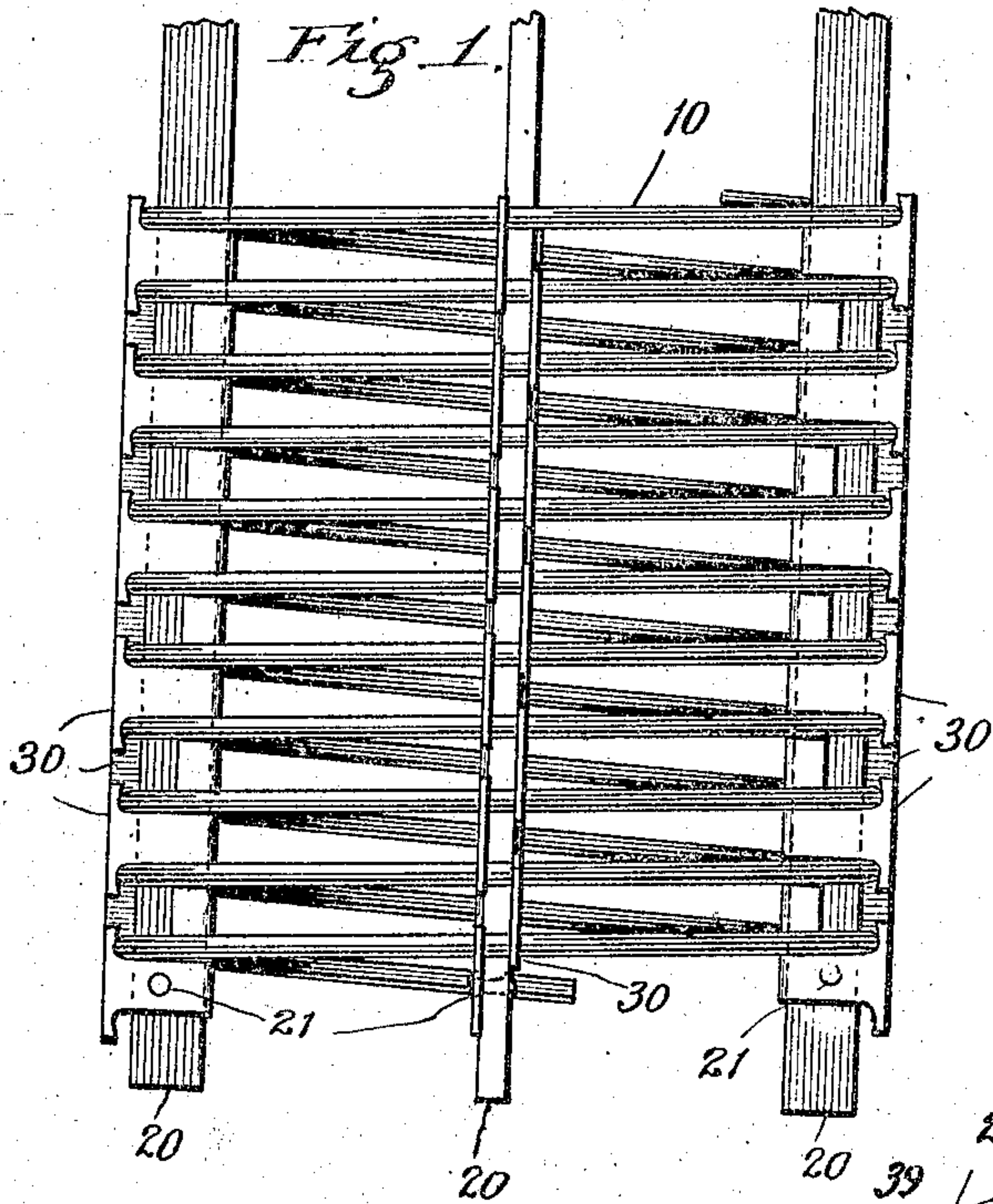


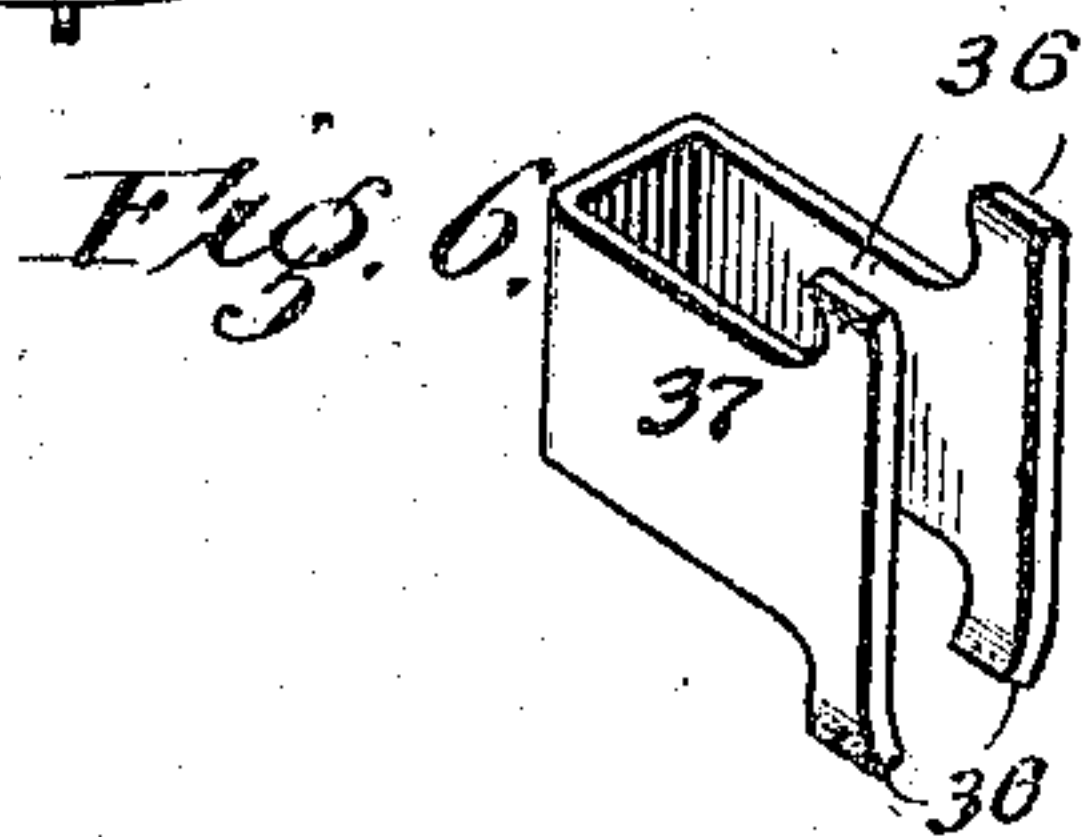
E. McCLURE.  
METAL REINFORCEMENT FOR REINFORCED CONCRETE COLUMNS.  
APPLICATION FILED SEPT. 16, 1907.

905,090.

Patented Nov. 24, 1908.



Witnesses:  
Frank Bunn.  
Wm. P. Bond



Inventor:  
Edward McClure,  
by Charles O. Sherry,  
his Atty.



# UNITED STATES PATENT OFFICE.

EDWARD McCLURE, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO FRANKLIN P. SMITH,  
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## METAL REINFORCEMENT FOR REINFORCED CONCRETE COLUMNS.

No. 905,090.

Specification of Letters Patent.

Patented Nov. 24, 1908.

Application filed September 16, 1907. Serial No. 392,995.

*To all whom it may concern:*

Be it known that I, EDWARD McCLURE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Metal Reinforcements for Reinforced Concrete Columns, of which the following is a specification.

My invention relates to certain improvements in metal reinforcements for reinforced concrete columns.

The ordinary form of reinforced concrete column contains vertical metal reinforcements adapted to take up the tensile strains, and horizontal or lateral metal reinforcements adapted to take up the lateral or bursting strains. These reinforcements are embedded in the concrete and a column thus made is exceedingly strong, and comparatively fire proof.

The object of this invention is to provide a simple practical and efficient spacing device for the horizontal or lateral metal reinforcement.

Another object is to provide a spacing device which may be employed in connection with a standard stock bar and horizontal reinforcement to connect the horizontal reinforcement with said bar.

Other objects and advantages will appear in the course of this specification, and the essential features will be more particularly pointed out in the claims.

The invention is clearly illustrated in the accompanying drawings, in which

Figure 1 is a side view of a metal reinforcement containing my improvements, Fig. 2 is a plan view thereof; Fig. 3 is a perspective view of a fragment of a modified form of the device. Fig. 4 is a perspective view of a clip. Fig. 5 is a perspective view of a modified form of structure. Fig. 6 is a perspective view of another modified form of clip, and Fig. 7 is a perspective view of a modification.

In the drawings 10 represents an encircling band, which may consist of a spiral coil, or of a plurality of rings or hoops, the ends of which are suitably joined. The spiral coil is formed by winding up a wire, rod, bar or the like upon a suitable mandrel. This spiral coil forms the horizontal or lateral metal reinforcement for the column, and resists the lateral or bursting strains thereof. It is of much importance that the

turns of the coil be maintained in a suitably separated condition until the concrete has been filled in around them and for this reason spacing or holding devices are employed to securely hold the turns in place. In some cases it is desirable to secure the spiral coil directly upon the bars or rods that form the metal vertical reinforcement or sustaining elements of the columns, while in other places it is preferable to space the turns of the coil by separate mechanism and add the upright reinforcements when the column is being completed at the building. My improved device is equally applicable in both cases.

In the form shown in Figs. 1 and 2, a number of uprights, posts or bars, 20, are shown, which extend longitudinally of the encircling band, and are secured thereto by metal clips 30. The size, or shape of the upright is immaterial to my invention, broadly considered, and if desired may consist of the metal vertical reinforcements or it may consist of light metal strips for use in connection with the spacing of the turns of the spiral coil. The clips 30, are preferably of sheet metal construction, and have hook portions 31, that pass around the rear or inner edges of the uprights 20. Shoulders, or seats 32 are provided upon said clips for engagement with the turns of the encircling band, and the distance between the shoulders upon each clip is made to determine the distance between the turns of the band. In the present case the side edges of the clip bear against the turns of the encircling band to separate and space them apart. Tangs 34 project up and down at one end of the clip and engage the spiral coil and clamp it upon the upright. The seats for the encircling band being upon the opposite edges of the clips, each clip acts as a strut between the adjacent turns of the band, thus separating them at the proper distances apart, and inasmuch as the clips and adjacent turns of the band abut against each other, there is no possibility of any movement of the turns of the band upon the uprights, when the ends of the band are clamped in place. The clips therefore act as seats or spacing devices for the encircling band, and rigidly connect and space the turns thereof upon the upright 20. The hook portions 31 serve the purpose of forming connecting means between the clips and



bars, but it is quite obvious that other devices might be employed, such as rivets, bolts, etc. for this purpose.

In building up a metal reinforcement containing my improvements, the posts or bars are preferably held in place upon a mandrel and the wire, rod or bar wound upon them to form the spiral coil. The first or end clips are preferably secured against longitudinal movement upon the uprights 20 by pins or rivets 21, which may be passed through the clips, or immediately below them to act as stops. The first turn of the wire or rod is then wrapped around the uprights and before or at the time that the next turn is wrapped around the uprights, another row of clips is attached to the bars with one of their seats in engagement with the first turn of the coil, and the second turn is then wound into the opposite seats of the second row of clips. The adjacent clips upon each upright are preferably arranged in staggered relation, that is, the adjacent ones are placed upon opposite sides of the upright as shown. This operation is continued until the section is completed whereupon the end clips are fastened in place. The tangs on the adjacent clips overlap and oppose each other, so that each turn of the coil is securely held in place thereby and there is no danger of becoming loosened from the upright. In this way a sectional spacing and connecting device is provided, which can be used in connection with uprights or bars of any suitable cross section and size. Furthermore, metal reinforcement sections can be built up of any desirable length, by securing the encircling band to the uprights with the use of the spacing and connecting devices.

In Figs. 3 and 4 the clip is illustrated as having the main or body portion stamped out, thus leaving a light frame like structure. A further advantage of this form consists in the fact that the concrete may cover more of the surface of the bar than when a solid clip is used. This has the effect of strengthening and otherwise improving the column. Where the clips are employed simply to secure the encircling band to light spacing strips, it is not so important that a large proportion of the surface of the strip shall be exposed, but when used in connection with the upright metal reinforcements it is preferable to use open clips. While I have shown four uprights it is perfectly obvious that as many vertical members can be employed as is found necessary.

Fig. 5 shows a tubular upright 22, and clips 35 that are clenched around the upright, and it is evident that other forms of uprights can be used. For instance they might comprise I bars, T bars, L bars, channel bars or any of the well known forms of uprights suitable for this purpose.

Fig. 6 shows a clip, which is in the form of a yoke 37 the two sides of which contain tangs 36 adapted to engage and space apart the turns of the encircling band.

Fig. 7 shows another modified form. The upright 23 is in the form of a channel iron, one flange 24 of which is shown as folded over to provide an overhanging ledge. The sectional spacing clips 38 have flanges or shoes 39 adapted to be seated in the groove of the channel iron upright, and are provided with notches 39<sup>a</sup> for engagement with the encircling band 10. These notches may be provided at any convenient place upon the clips and as shown are formed on one of the ends thereof. If desired, notches may be formed in both ends.

The sections after being built up at the factory are transported to the building and after being placed in position are inclosed in forms or molds, which are then filled with concrete. When the concrete is set the molds are removed.

Among the advantages of this construction is the ease with which the encircling band can be secured to the uprights and the accuracy of the spacing. Furthermore the clips can be made of various sizes whereby the pitch of the windings can be varied and more or less metal included in each column section.

I realize that various alterations and modifications of the device are possible without departing from the spirit of my invention and I do not therefore, desire to limit myself except as pointed out by the following claims.

I claim as new and desire to secure by Letters Patent:

1. A spacing clip for spacing and connecting the metal encircling member and vertical bars of reinforced concrete columns, comprising a body portion having two oppositely facing spacing seats for spacing apart two adjacent turns of the encircling member, tangs overhanging said seats, and a bar engaging hook arranged to clamp said turns against the bar.

2. A spacing clip for spacing and connecting the metal encircling member and the vertical bars of reinforced concrete columns, comprising a body portion having a pair of seats for said encircling member, tangs overhanging said seats, and extending in opposite directions to each other, and an extension constructed and arranged to grasp the bar to clamp the encircling member thereupon.

3. A spacing clip for spacing and connecting the metal encircling band to the vertical bars of reinforced concrete columns, having oppositely facing band engaging devices for a plurality of the turns of the band and means for clamping said turns against the bar.



4. A spacing clip for spacing and connecting the encircling band to the vertical bars of reinforced concrete columns, having band engaging devices for two adjacent turns of the band, and a bar engaging hook, said band engaging device and hook being constructed and arranged to clamp said turns against the bar.

5. A spacing clip for spacing and connecting the encircling band to the vertical bars of reinforced concrete column, having retaining tangs for two adjacent turns of the band, and a bar engaging hook, said tangs and hook being constructed and arranged to clamp said turns against the bar.

6. In a metal reinforcement for reinforced concrete columns, an encircling band, members extending longitudinally thereof, and a series of unconnected spacing clips secured upon each of the longitudinal members, each clip having positioning seats for two adjacent turns of the band.

7. In a metal reinforcement for reinforced concrete columns, an encircling band, longitudinal members, and a series of unconnected spacing clips, each clip having positioning seats for two adjacent turns of the band, and devices for clamping said turns upon the longitudinal members.

8. In a metal reinforcement for reinforced concrete columns a spiral encircling band, longitudinal members, and a series of unconnected clips secured upon the longitudinal members, each clip having two spacing seats for two adjacent turns of the band.

9. In a metal reinforcement for reinforced concrete columns, a spiral encircling band, longitudinal members, and a series of unconnected spacing clips, each clip having spacing and connecting devices for two adjacent turns of the band, and means for clamping said turns of the band upon the longitudinal members.

10. In a metal reinforcement for reinforced concrete columns, a spiral encircling band, longitudinal members and connecting clips, each clip having band engaging tangs for two adjacent turns of the band, and

hooks for engagement with the longitudinal members.

11. In a metal reinforcement for reinforced concrete columns, an encircling band, longitudinal sustaining members, and a series of unconnected spacing clips secured upon the longitudinal members, each clip having spacing seats for two adjacent turns of the band.

12. In a metal reinforcement for reinforced concrete columns, an encircling band, longitudinal sustaining members, and unconnected, open-work connecting clips, each clip having two spacing seats for two adjacent turns of the band, and means for clamping said turns of the band upon the sustaining members.

13. In a metal reinforcement for reinforced concrete columns, a spiral encircling band, longitudinal sustaining members, and connecting clips, each clip having band engaging tangs for two adjacent turns of the band and hooks for connection with the sustaining members.

14. In a metal reinforcement for reinforced concrete columns, a spiral encircling band, longitudinal sustaining members, and unconnected spacing clips, each clip having means for spacing and clamping two adjacent turns of the band upon the sustaining bar.

15. In a metal reinforcement for reinforced concrete columns, an encircling band, longitudinal members and unconnected clips extending between the adjacent turns of the band, said clips being independent of and separate from the longitudinal members, and having means for spacing the turns apart and clamping them against the longitudinal members.

In witness whereof I have executed the above specification at Chicago, county of Cook and State of Illinois this 12th day of September 1907.

EDWARD McCLURE.

Witnesses:

CHARLES O. SHERVEY,  
WILLIAM P. BOND.