

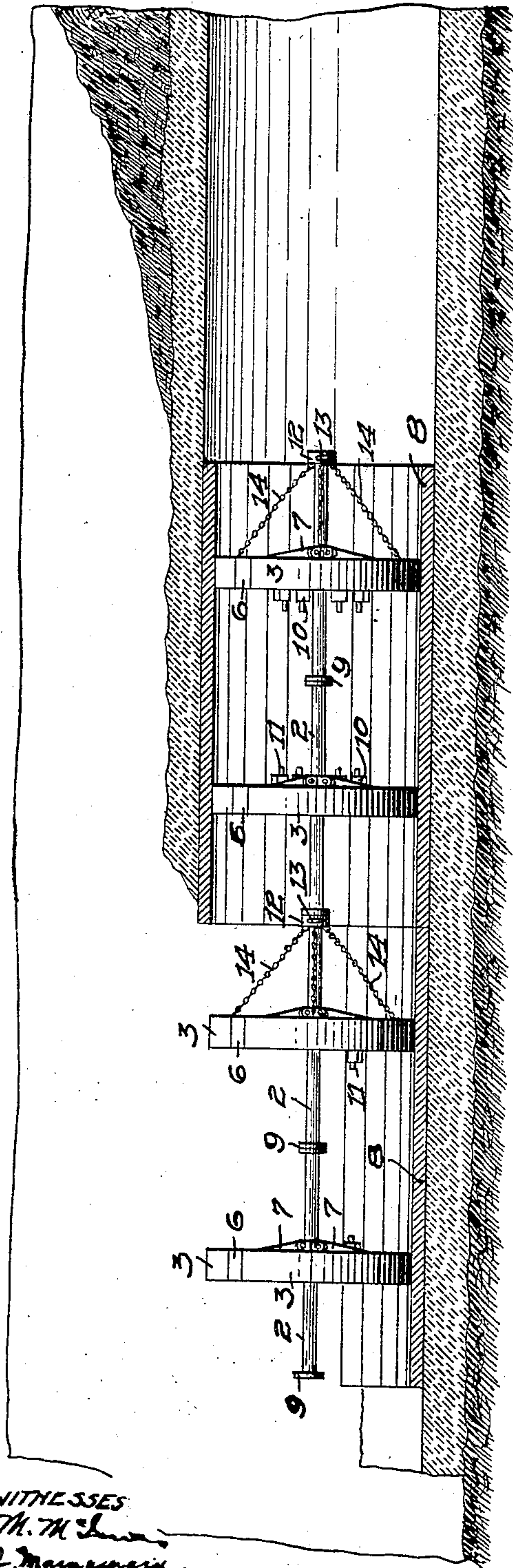
No. 855,174.

PATENTED MAY 28, 1907.

F. M. HENRY.  
MOLD FOR CONCRETE CONSTRUCTION.

APPLICATION FILED DEC. 18, 1905.

3 SHEETS—SHEET 1.



WITNESSES  
Th. M. Jones  
C. M. M. Jones

FIG. 1.

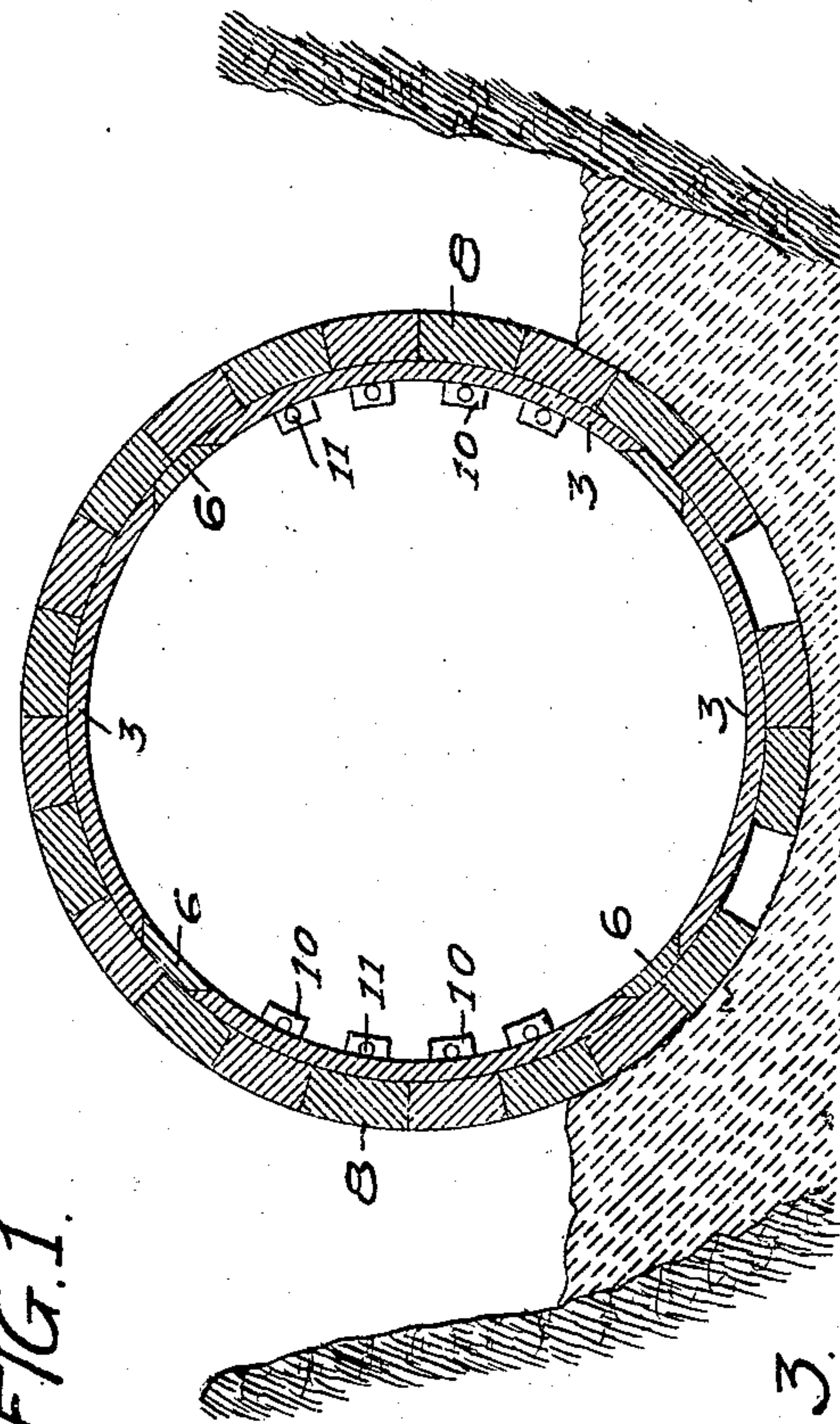


FIG. 3.

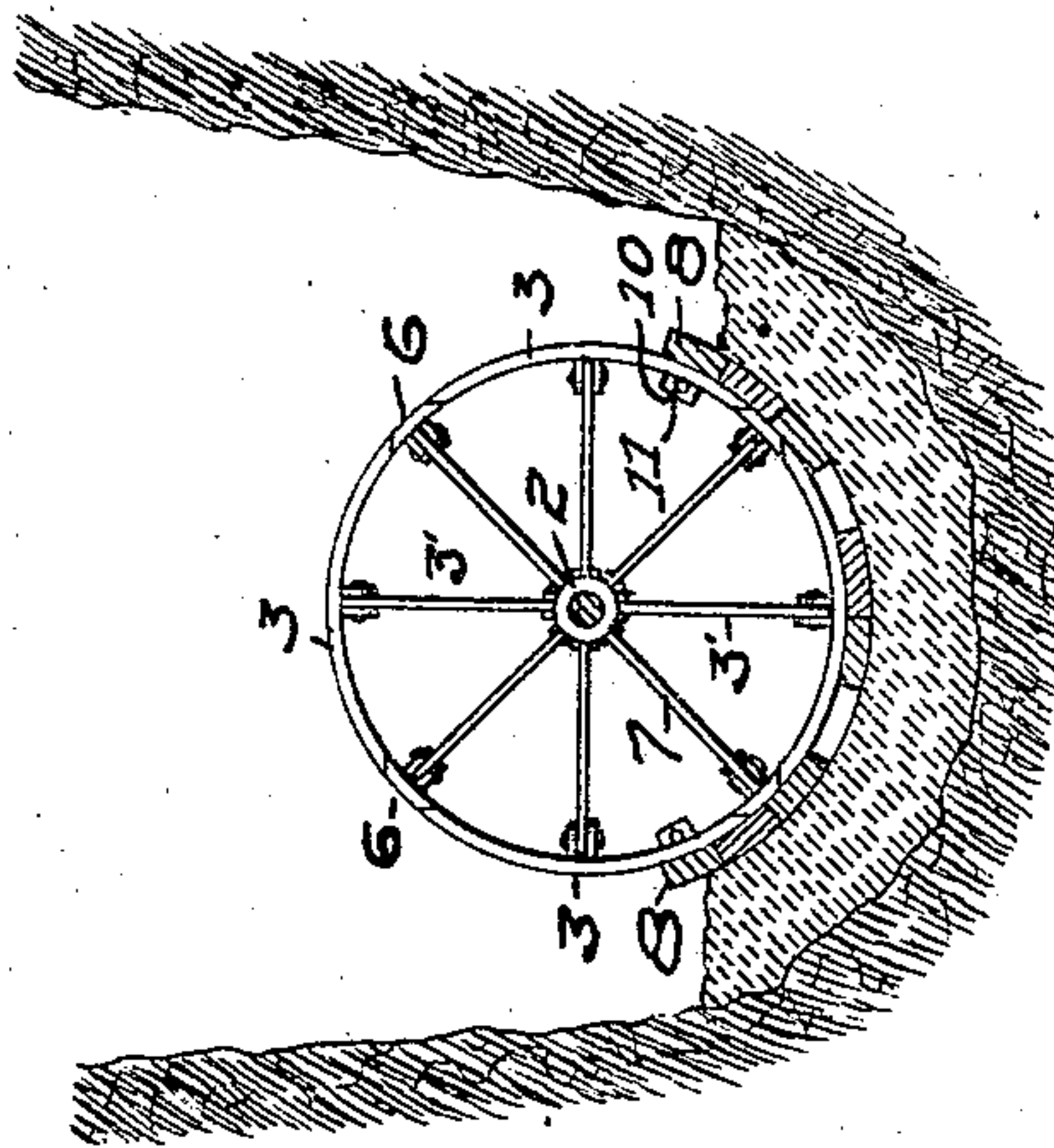


FIG. 2.

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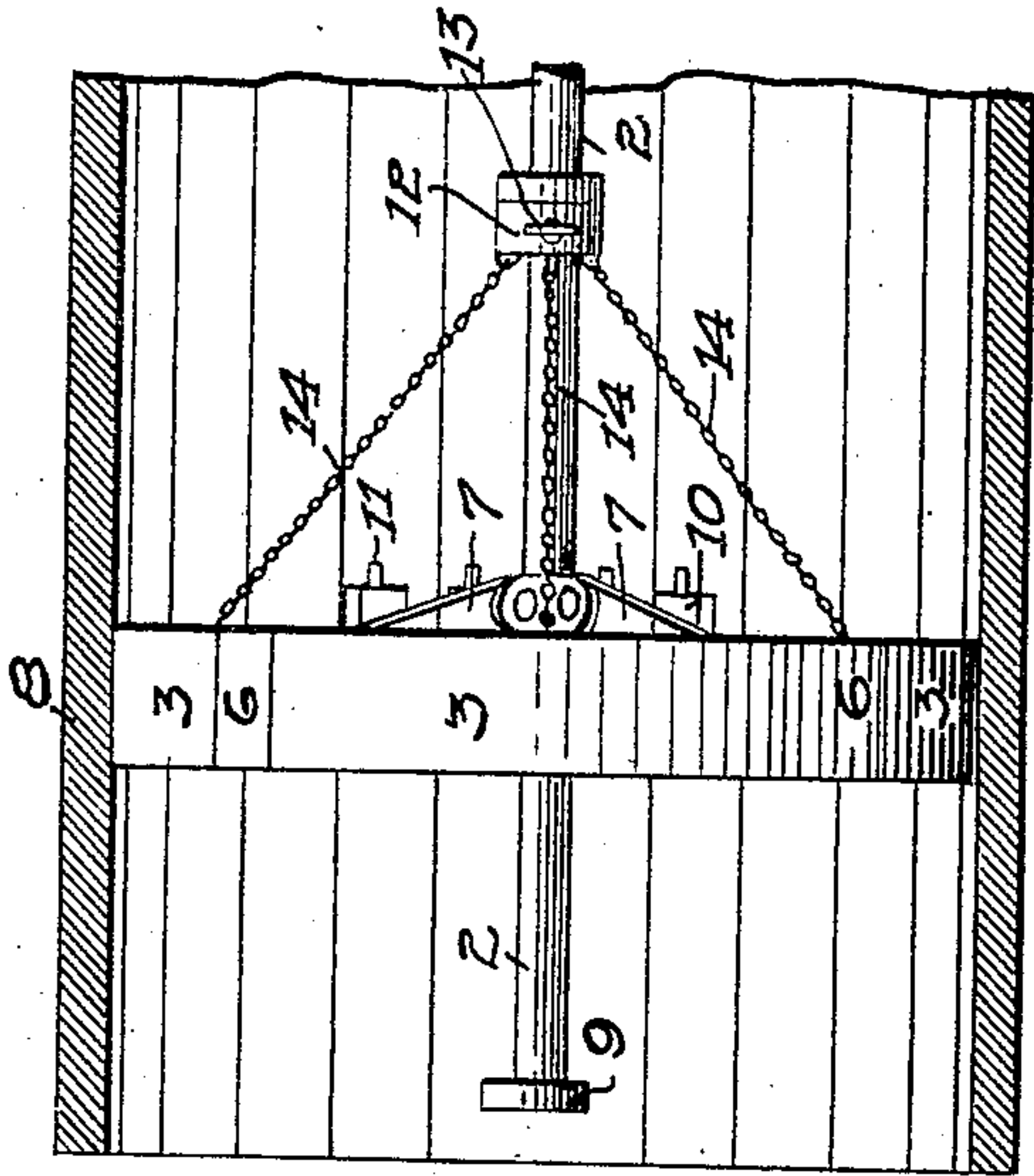


FIG. 4.

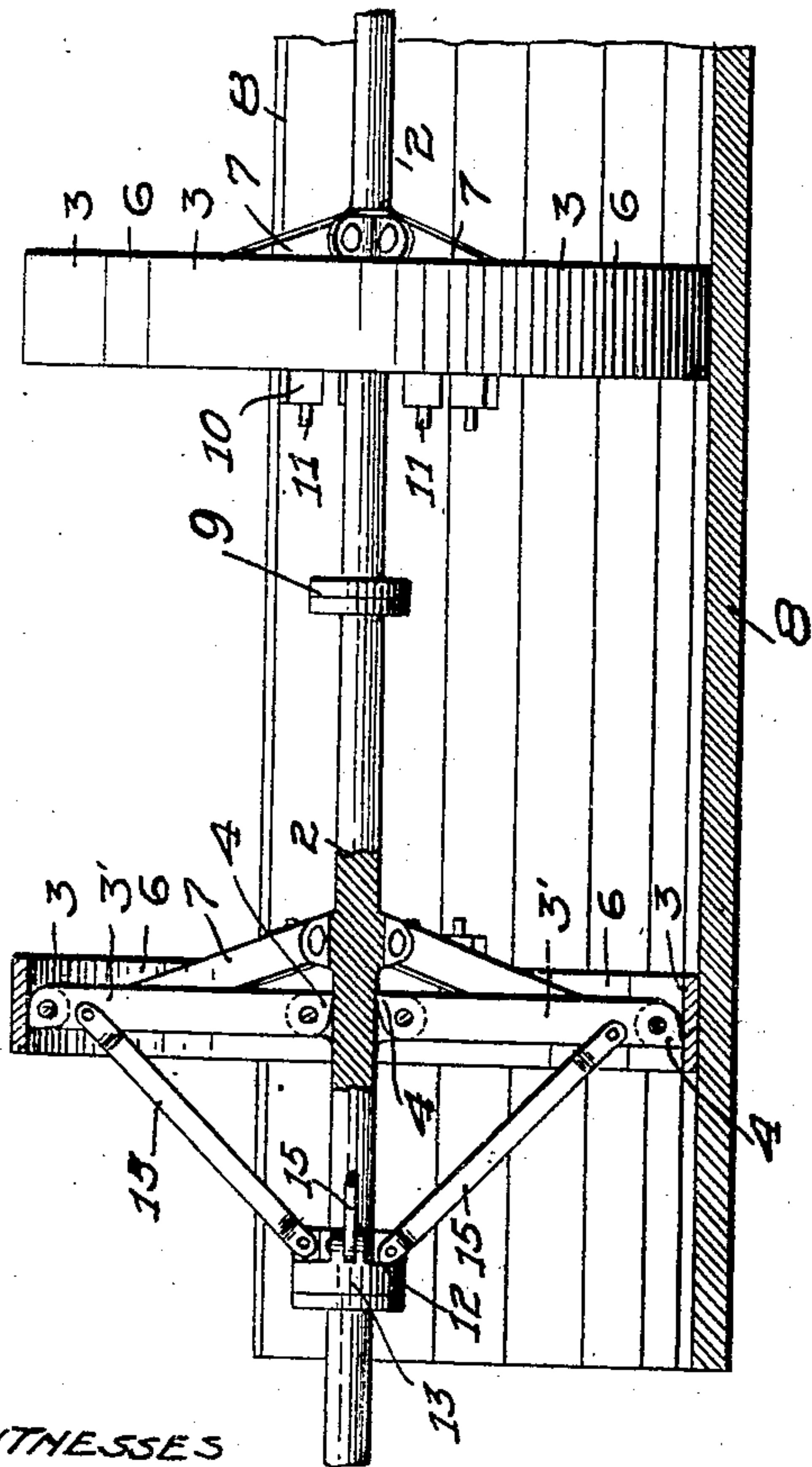


FIG. 5.

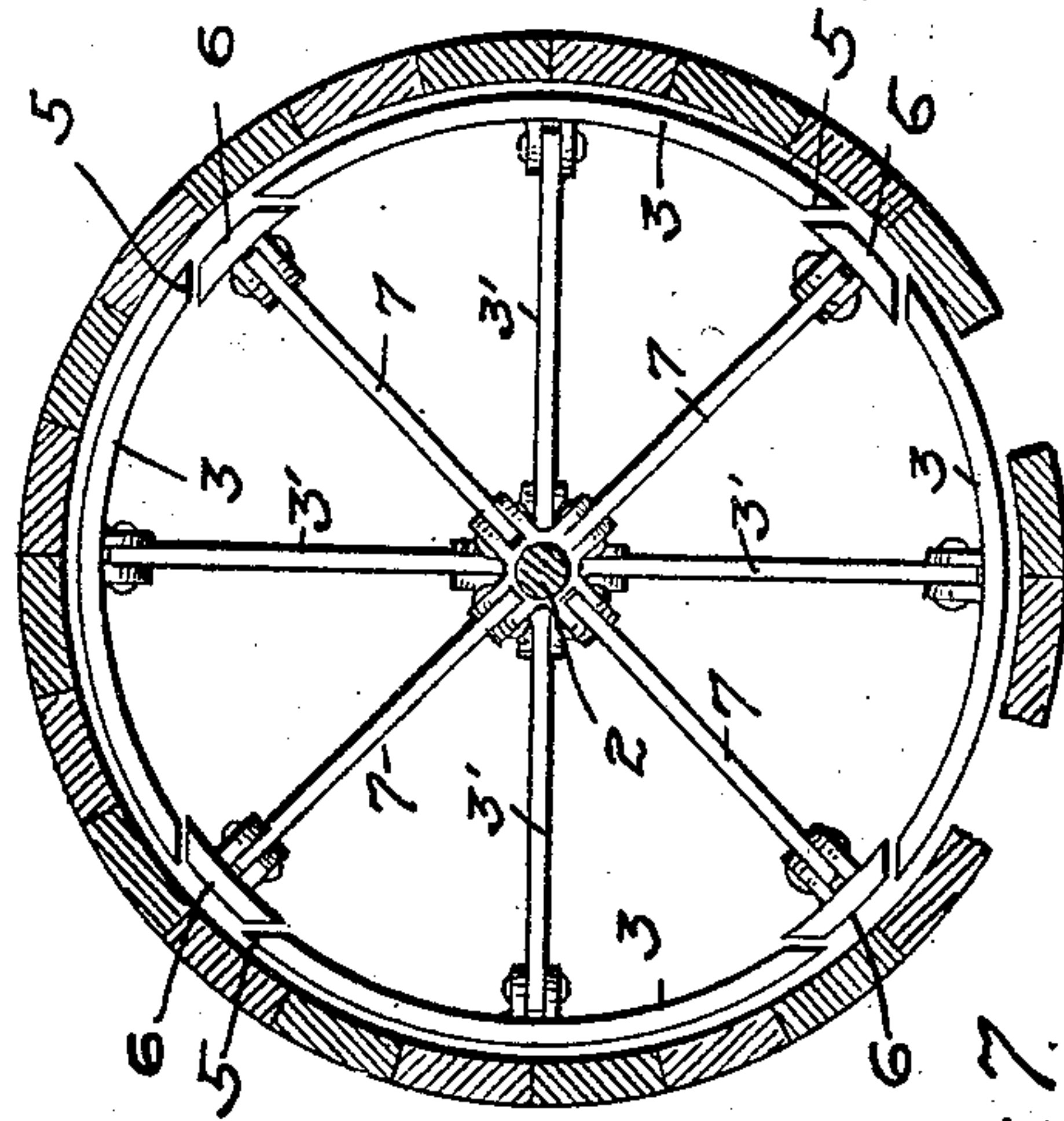


FIG. 7.

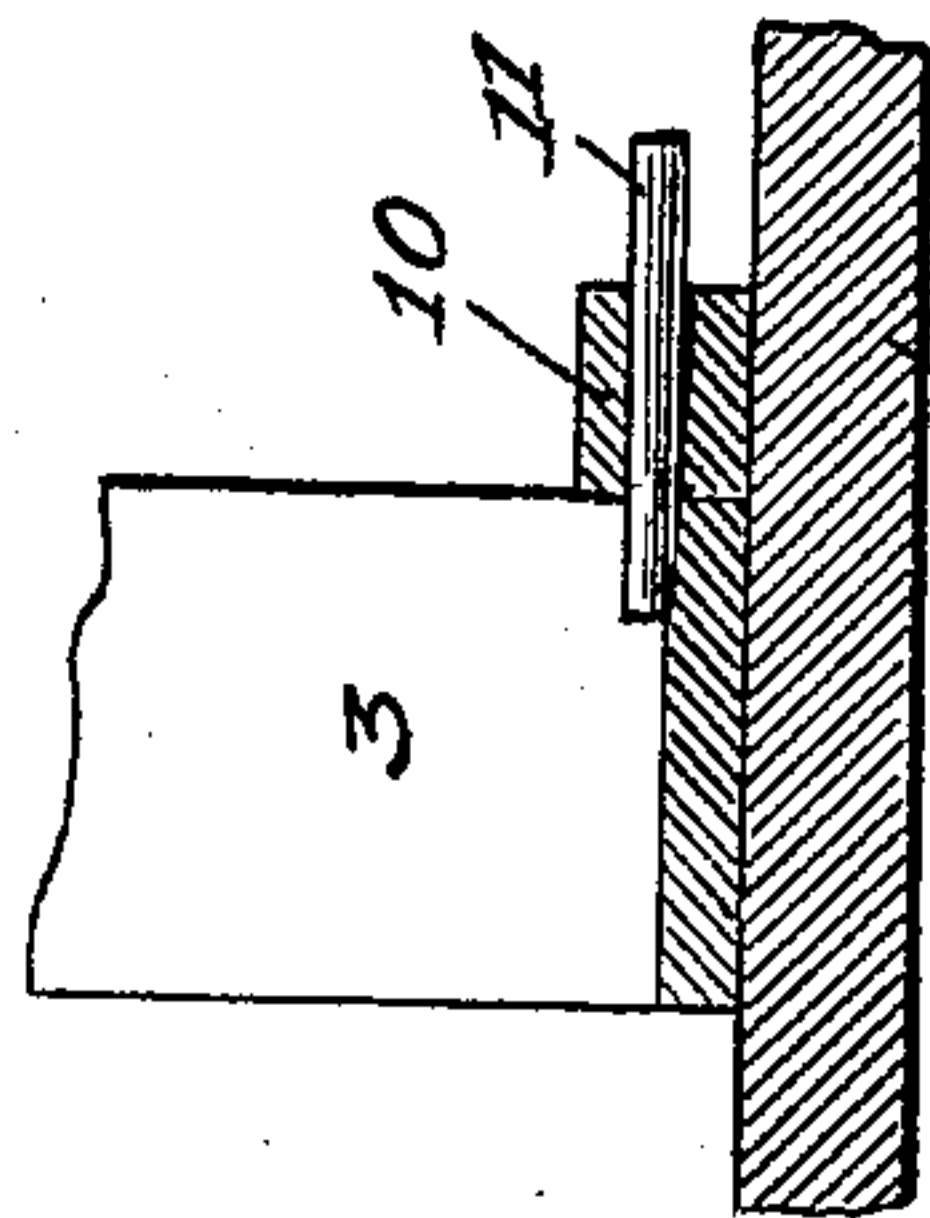


FIG. 8.

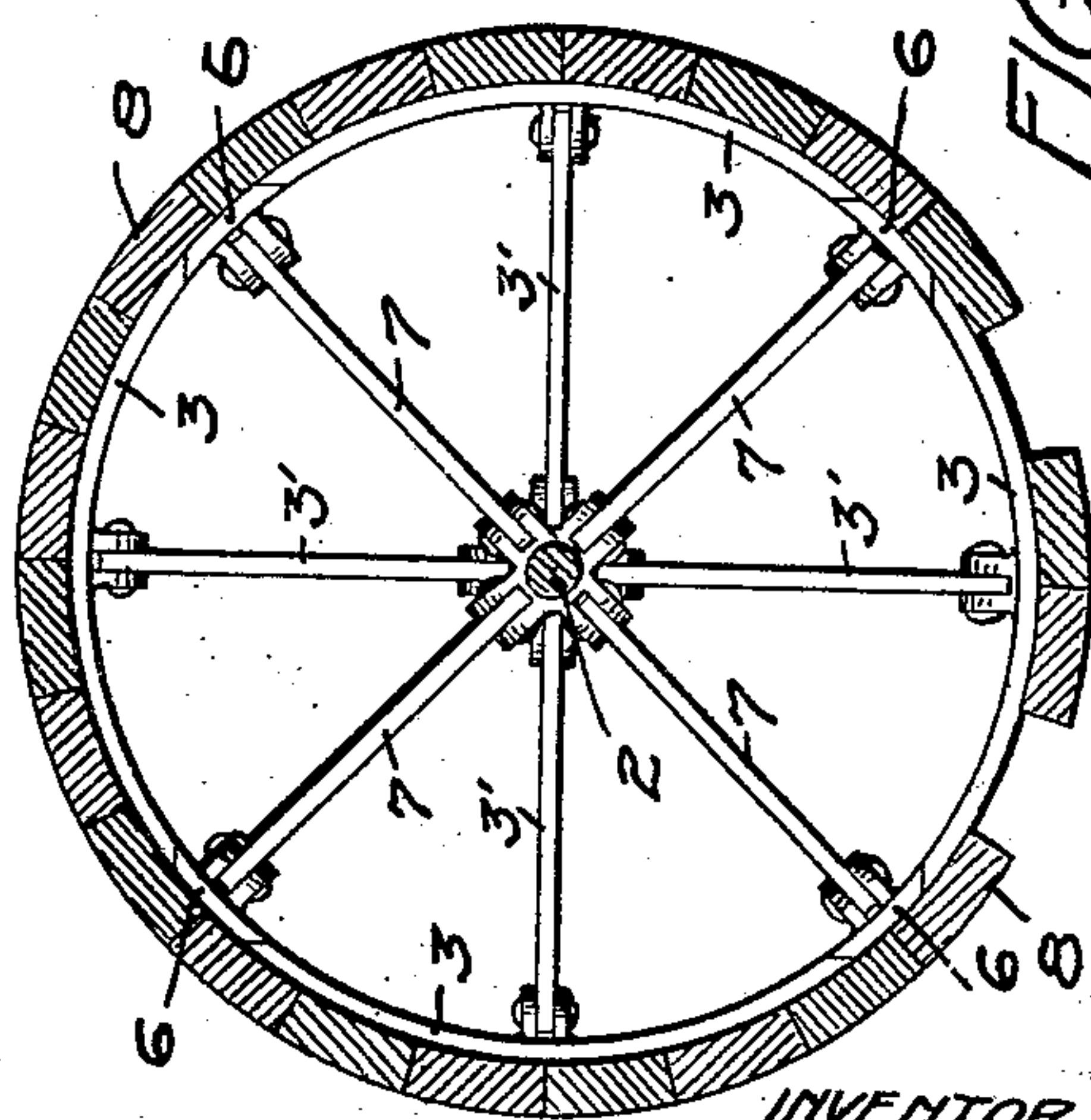


FIG. 6.

WITNESSES  
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3 SHEETS—SHEET 3.

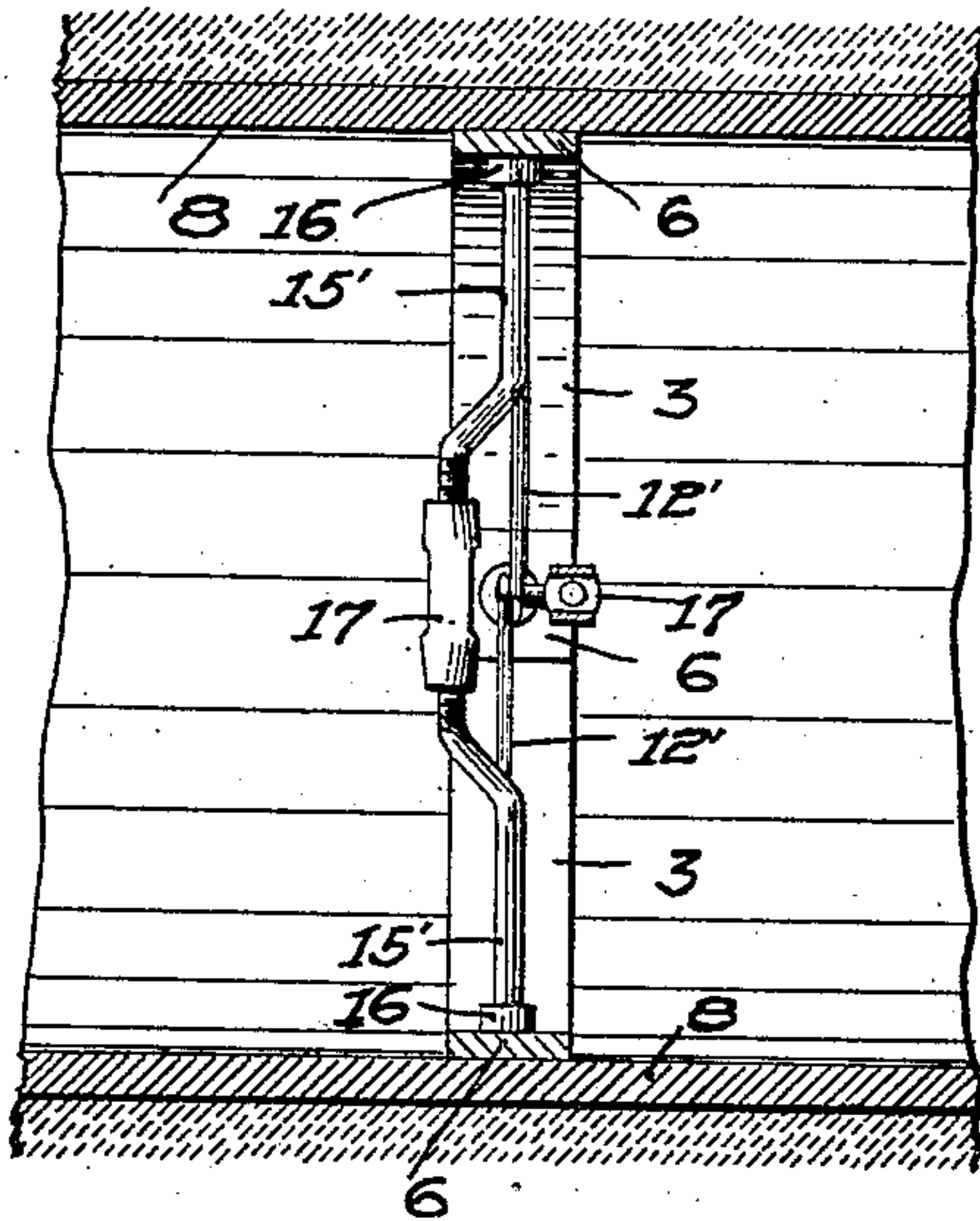


FIG. 11.

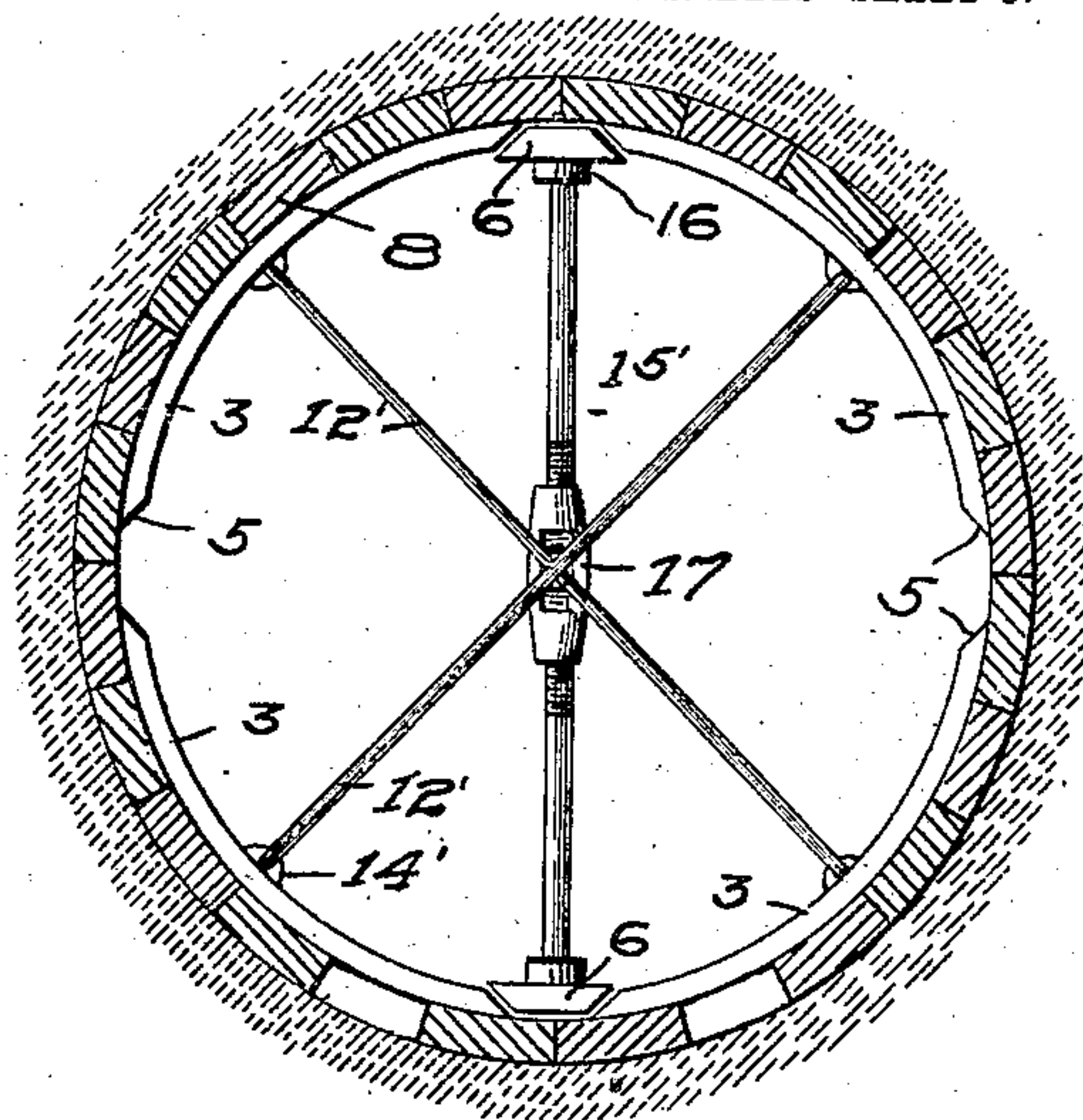


FIG. 10.

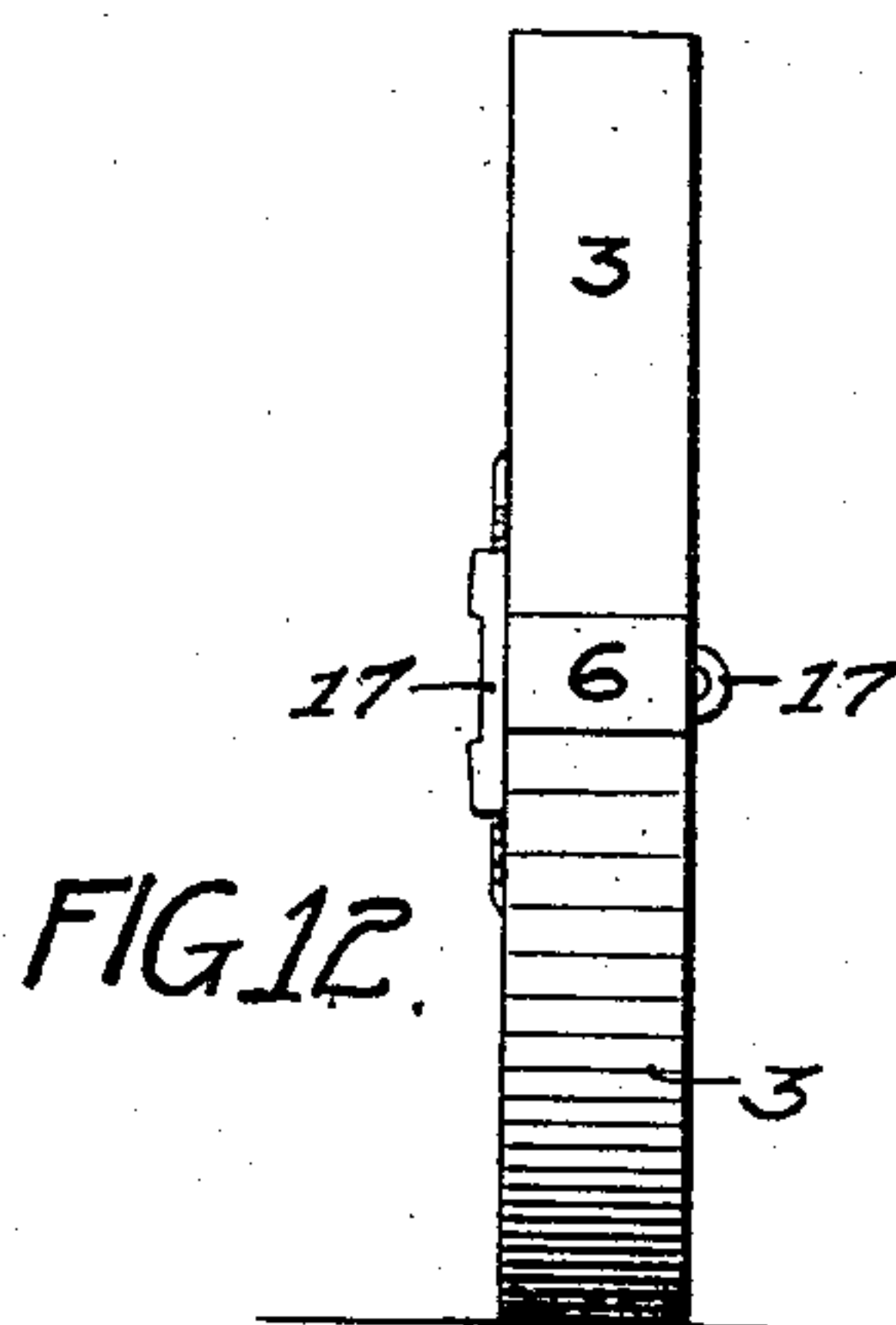


FIG. 12.

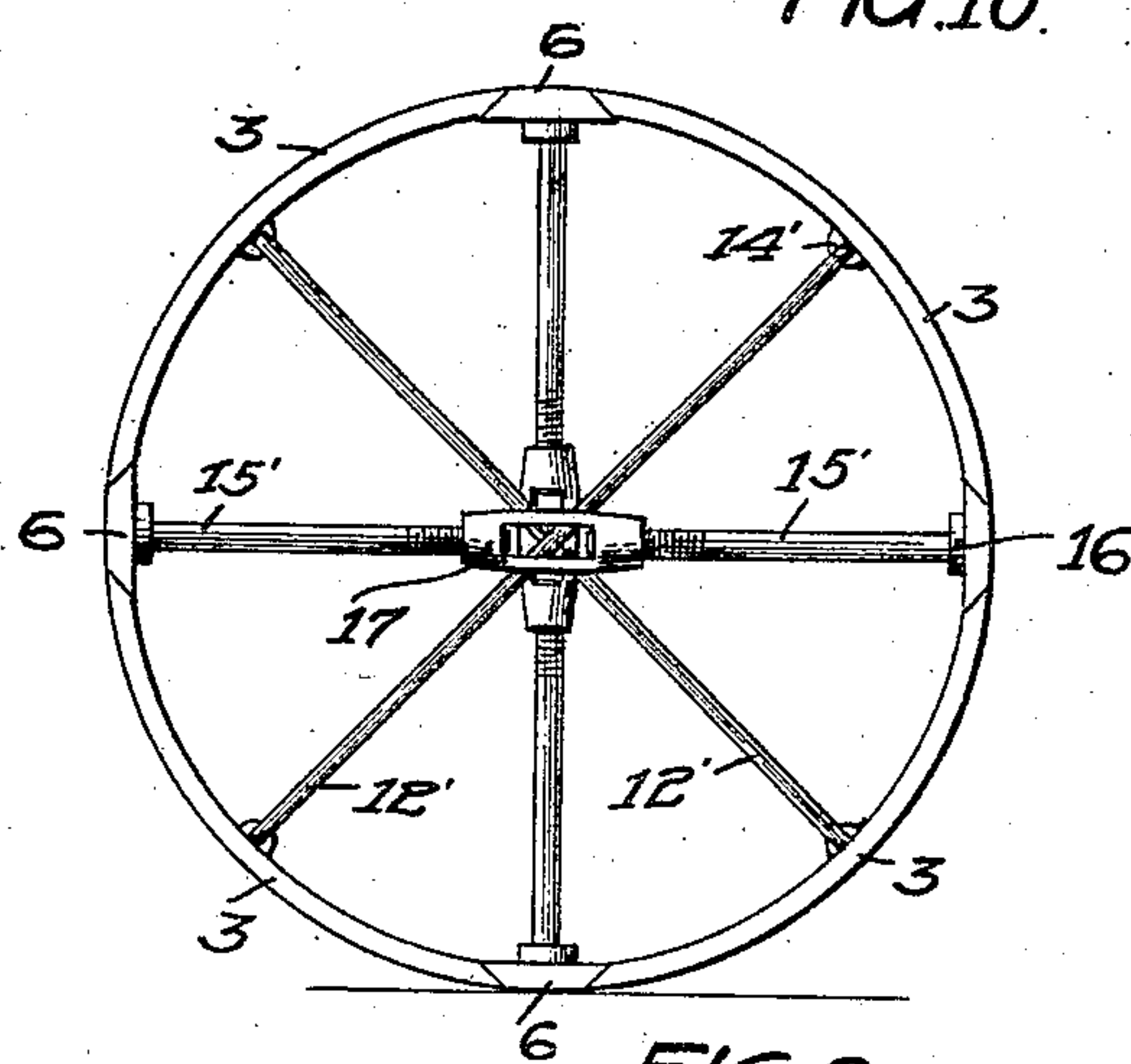


FIG. 9.

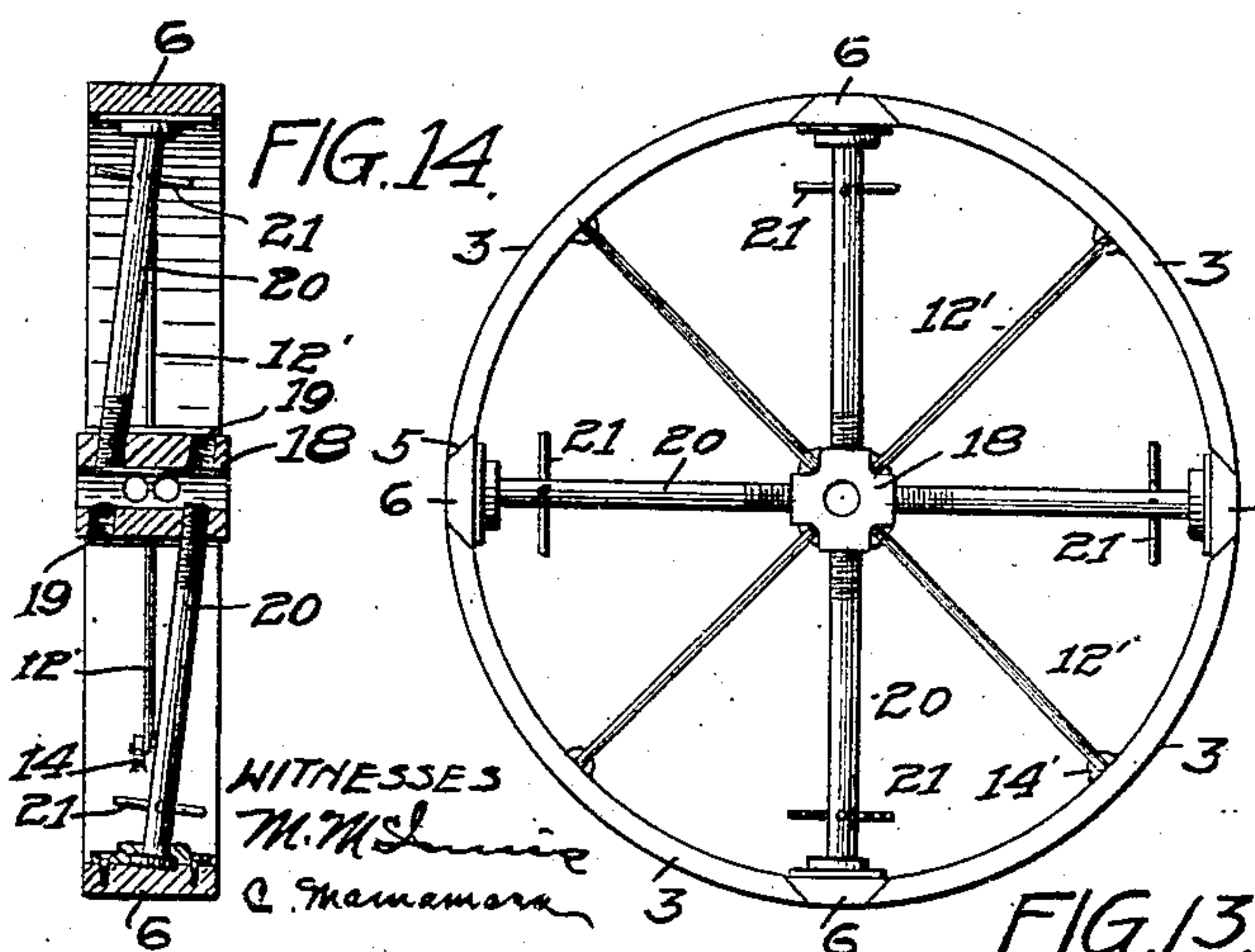


FIG. 13.

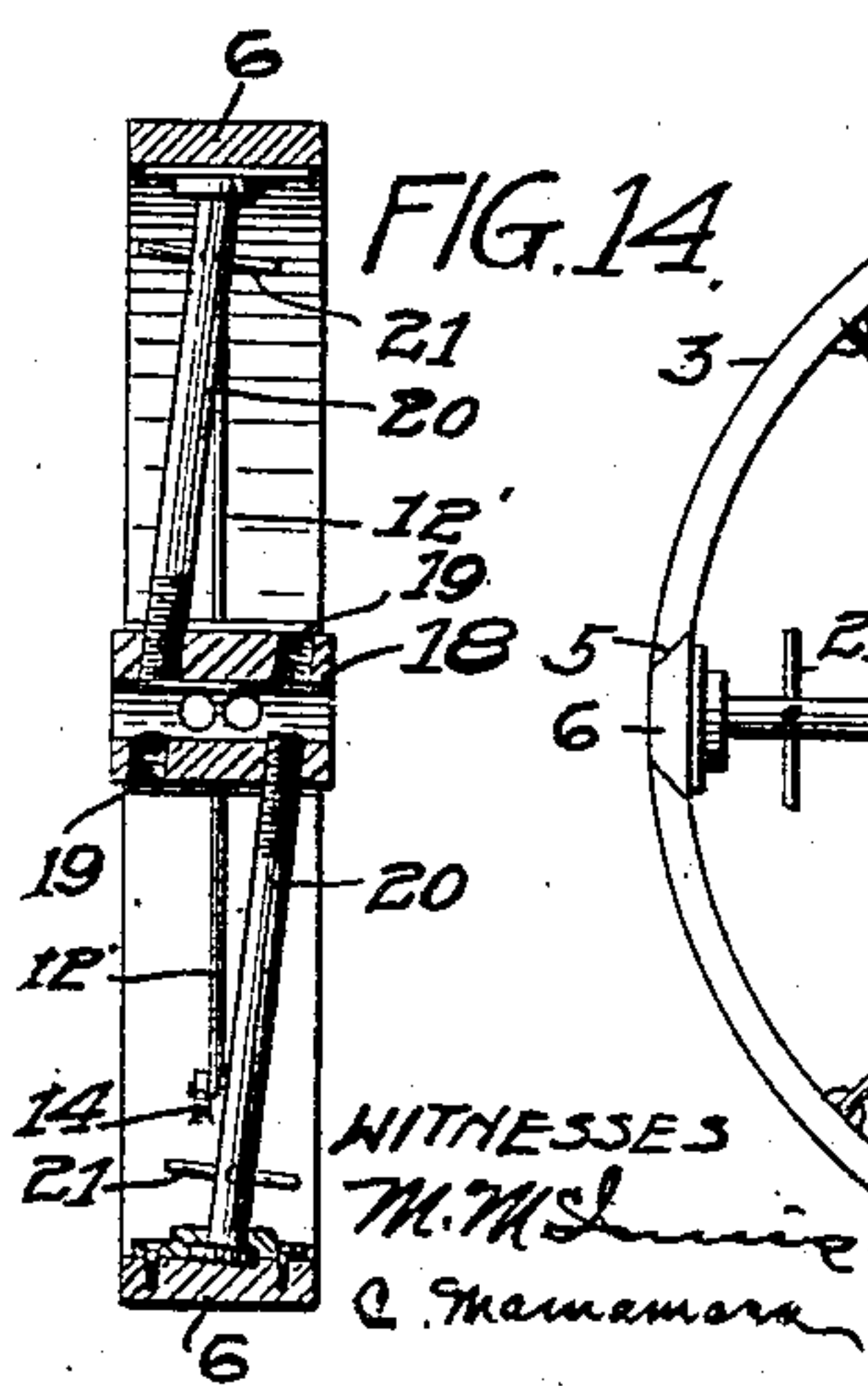


FIG. 14.

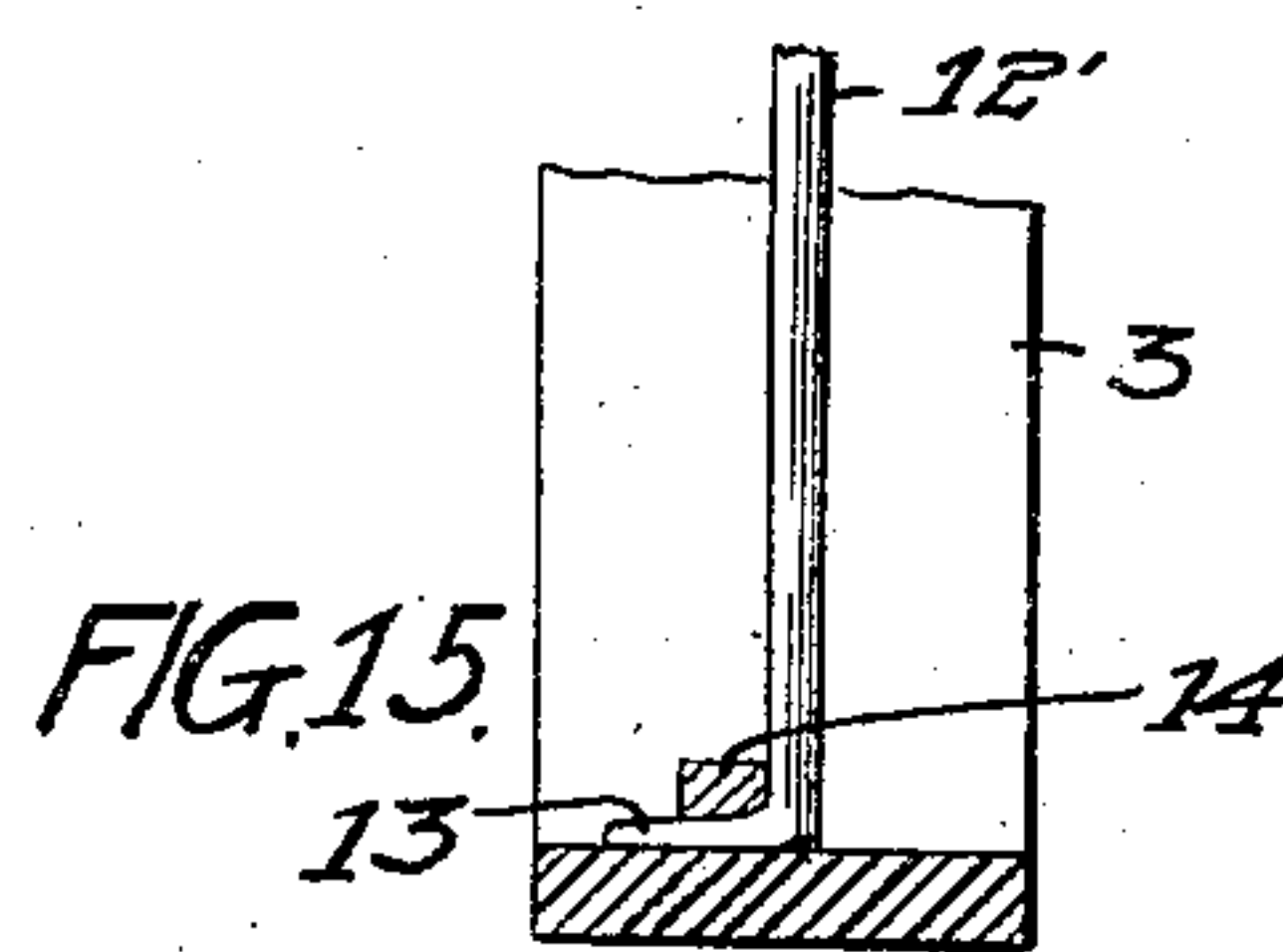


FIG. 15.

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# UNITED STATES PATENT OFFICE.

FRANCIS M. HENRY, OF MINNEAPOLIS, MINNESOTA.

## MOLD FOR CONCRETE CONSTRUCTION.

No. 855,174.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed December 18, 1905. Serial No. 292,126.

*To all whom it may concern:*

Be it known that I, FRANCIS M. HENRY, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Molds for Concrete Construction, of which the following is a specification.

My invention relates to molds used in concrete work, and designed particularly for sewer construction.

The object of my invention is to provide a mold which will be collapsible and easily removed from the sewer after the concrete has set.

A further object is to provide a mold which can be easily and quickly set up and made ready for use, and when removed from the sewer can be contracted sufficiently to be taken out of the ordinary manhole without difficulty.

A further object is to cheapen the cost of construction of the ordinary concrete sewer, by providing an apparatus which can be used over and over and in which the network of timbers and braces usually required in sewer work of this kind is easily dispensed with.

My invention consists, generally, in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification, Figure 1 is a longitudinal sectional view illustrating my apparatus in use in a sewer trench. Fig. 2 is a transverse view of the trench and mold showing the base or bottom of the sewer completed and with the mold ready to receive the planking or lining on which the concrete is laid. Fig. 3 is a similar view illustrating the lining in place around the entire mold. Fig. 4 is a longitudinal sectional view through the mold and lining. Fig. 5 is a similar view illustrating a modified construction of the mold. Figs. 6 and 7 are transverse sectional views through the mold showing it in its expanded and contracted position. Fig. 8 is a detail view illustrating the manner of securing the lining planks to the supporting sections of the mold. Fig. 9 illustrates a modified construction of the mold in its expanded position. Fig. 10 is a similar view showing the mold in use. Fig. 11 is a longitudinal sectional view of the same. Fig. 12 is a view of one of the lock sections wherein the lining planks are laid. Fig. 13 is an end view of a mold showing a modified means for expanding and contracting the same. Fig. 14 is a

sectional view thereof, and Fig. 15 is a detail of the device employed for holding the arc-like sections or segments of the mold in their proper relative position.

In the drawing, 2 represents a central shaft or rod, and 3 a series of curved arc-like sections arranged around the rod 2 and equidistant therefrom and pivotally connected by bars 3' with said rod. The bars 3' have their ends rounded on one side and provided with lugs or projections 4 on the other side, which, when the bars are swung to a position substantially at right angles to the rod 2, will engage the said rod and the inner surfaces of the sections 3 and prevent further movement of the bars in that direction. There may be any suitable number of these sections and bars according to the size of the mold, but in this application I have shown four sections connected by a corresponding number of bars with the central rod 2. The sections have beveled ends 5 spaced from one another around the periphery of the mold, and wedge-shaped blocks 6 are provided to fit into the spaces between the sections and bear snugly against their beveled ends and complete the ring or hoop partially formed by said curved sections. These wedge-shaped blocks are also connected with the rod 2 by bars 7 arranged intermediate to the bars 3 and obliquely with respect thereto and the rod 2, the proper angle of the bars 7 with respect to the rod 2 being determined by the degree of movement desired and the size of the mold.

The manner of pivoting the bars 3 and 7 on the rod 2 will cause the latter to have a quicker initial movement than the former; and, consequently, when the rod 2 is moved lengthwise in one direction the wedge-shaped blocks 6 connected with the bars 7 will be drawn inwardly a predetermined distance before any appreciable movement of the curved sections 3 takes place.

In expanding the mold the blocks will be pressed in between the beveled contiguous ends of the sections, forcing them apart and expanding the ring to the desired extent to form a support with a temporary planking or lining of the sewer. This planking or lining I will denominate by reference numeral 8, and describe it generally as consisting of a series of narrow plank, of suitable width and thickness, placed side by side on the periphery of the rings or sections forming the mold and comprising with said rings a cylindrical support on which the concrete is laid.



The lining may be of any suitable length, and one ring will be employed at each end thereof, the distance between the rings depending upon the size of the sewer and the weight of the shell of concrete. Ordinarily, this lining  
 5 or planking will be about eight feet in length, with a supporting ring near each end, and the contiguous ends of the rods of each ring connected by a coupling 9.

10 To hold the lining in place on the rings, I provide blocks 10 thereon, wherein pins 11 are slidably mounted and adapted to be pushed out between the hoop or ring sections and the rod 2 and act as sliding bolts to pre-  
 15 vent the lining planks from accidentally becoming displaced on the rings during the construction of the sewer shell. Any suitable means (not shown) may be provided for operating these pins at one end of the plank  
 20 lining without the necessity of the workman crawling through the rings to reach them.

As heretofore described, the bars 3 are provided with means to prevent them from swinging too far in one direction, and to lock  
 25 them against movement in the other direction until the apparatus is collapsed I provide a collar 12 slidably mounted on the rod 2 and having a thumb screw 13 to enter recesses in said rod, and chains 14 connecting  
 30 said collar with the bars 3. When, therefore, the collar has been properly adjusted and the bars 3' swung to a position at right angles substantially to the rod 2 and the lining planks are laid on the ring sections, the  
 35 pressure will put the chains under tension, but the ring cannot collapse until the collar is released and the chains loosened.

In Fig. 5 I have shown a modification which consists in providing arms 15 connect-  
 40 ing the bars 3 with the adjustable collar, and arranged to hold the said bars and the ring in their expanded position by compression; whereas in the construction shown in Fig. 4 the flexible connections between the bars and  
 45 the collar are under tension.

In Figs. 9, 10 and 11 the rod running lengthwise of the sewer and connecting the contiguous rings is omitted, and in place thereof I provide cross rods 12' having hooked ends  
 50 13' slightly wedge-shaped in form and adapted to slide into loops or eyes 14' provided on the inner surface of the sections 3 and hold them in their expanded position. Rods 15 have threaded outer ends to enter sockets 16  
 55 in the wedge-shaped blocks, and have threaded inner ends connected by turn-buckles 17, said inner ends being offset out of the plane of the outer ends by bending the middle portion of the rods for the purpose of providing  
 60 clearness for the revolution of the turn-buckles. The operator grasping these turn-buckles can easily and quickly expand or contract the blocks and set up or collapse the mold.

65 In Figs. 13 and 14 I have shown slightly

another modification, which consists in providing a central hub 18 having threaded sockets 19 to receive the correspondingly threaded ends of rods 20, the outer ends of  
 70 said rods having bearings in the wedge-shaped blocks. Pins 21 are provided in the rods 20 to facilitate the revolution of the same and the adjustment of the blocks. The sections 3 of each ring in the construction shown in Figs. 13 and 14 are connected  
 75 by the rods 12 shown and described with reference to Fig. 9.

I claim as my invention:

1. A mold for concrete construction comprising a ring divided into a series of seg-  
 80 ments spaced from one another, means supporting said segments, blocks wedge-shaped in cross section adapted to fit into the spaces between the ends of the contiguous segments, means for moving said blocks toward or from  
 85 the center of the mold to contract or expand the same, and a planking inclosing said ring, substantially as described.

2. A mold for concrete construction comprising a ring divided into a series of seg-  
 90 ments spaced from one another, means for supporting said segments, blocks wedge-shaped in cross section fitting into the spaces between the ends of adjoining segments, means for moving said blocks toward or  
 95 from the center of the mold to contract or expand the same, a planking inclosing said ring, and means for temporarily locking said planking on said segments, substantially as described.

3. A mold for concrete construction comprising rings each divided into a series of seg-  
 100 ments, each segment of a ring being spaced from the adjoining segment of the same ring, blocks wedge-shaped in cross section fitting  
 105 into the spaces between said segments, mechanism for moving said segments and said blocks toward or from the center of the mold to contract or expand the same, and means connecting the moving mechanism of one  
 110 ring with the corresponding mechanism of the other ring, and a planking inclosing said rings, substantially as described.

4. A mold for concrete construction comprising a ring divided into a series of seg-  
 115 ments with spaces between them, blocks wedge-shaped in cross section fitting into said spaces, a centrally arranged rod, and bars connecting said rod with said segments and said blocks respectively, and the bars  
 120 connecting said blocks with said rod forming a smaller angle therewith than the bars connecting said segments and said rod, and a planking inclosing said ring, substantially as described.

5. A mold for concrete construction comprising a ring divided into a series of seg-  
 125 ments with spaces between them, blocks wedge-shaped in cross section fitting into said spaces, a centrally arranged rod, means  
 130



connecting said rod with said segments and said blocks respectively, and whereby the longitudinal movement of said rod will impart a greater initial movement to said blocks than to said segments, and a planking inclosing said ring, substantially as described.

6. In a mold for concrete construction, the combination, with a ring divided into a series of segments with spaces between their contiguous ends, of blocks wedge-shaped in cross section fitting into said spaces and engaging the ends of said segments, a longitudinally movable rod, and means connecting said rod and blocks to move the latter toward and from the center of the mold to contract and expand said ring and a casing inclosing said ring.

7. In a mold for concrete construction, the combination with a ring divided into a series of segments with spaces between the contiguous ends of adjoining segments, and blocks wedge-shaped in cross section fitting into said spaces, of a centrally arranged rod, and bars connecting said rod with said segments and said blocks, the bars connecting said segments with said rod being substantially at right angles thereto, and the bars connecting said blocks with said rod being obliquely arranged with respect thereto when said ring is in its expanded position and a casing inclosing said ring, substantially as described.

8. In a mold for concrete construction, the combination with a ring divided into a series of segments with spaces between the contiguous ends of adjoining segments, and blocks wedge-shaped in cross section fitting into said spaces, a centrally arranged rod, bars connecting said rod with said segments and said blocks respectively and arranged to expand said ring or contract the same when said rod is moved longitudinally, and means for locking said segments and blocks in their expanded position, substantially as described.

9. In a mold for concrete construction, the

combination with a ring divided into a series of segments with spaces between them, and blocks wedge-shaped in cross section fitting into said spaces, a centrally arranged rod, bars connecting said rod with said segments and blocks respectively, a collar slidable on said rod, and chains connecting said collar with said segment bars, substantially as described.

10. A mold for concrete construction comprising rings each divided into a series of segments with spaces between them, and blocks wedge-shaped in cross section fitting into said spaces each ring having a centrally arranged rod and a coupling connecting them, bars connecting said rods with said segments and said blocks, the bars connecting said blocks with said rod being arranged to impart a quicker initial movement to said blocks than the bars connecting said segments with said rod, and a planking inclosing said rings, substantially as described.

11. A mold for concrete construction comprising a shell divided into a series of segments with spaces between them, blocks wedge-shaped in cross section fitting into said spaces, a rod, means connecting said rod with said segments and blocks, and whereby the longitudinal movement of said rod will impart a greater initial movement to said blocks than to said segments and a casing inclosing said ring, substantially as described.

12. A mold for concrete construction comprising a ring divided into a series of segments, a centrally arranged rod, means connecting said rod with said segments whereby longitudinal movement of said rod will contract or expand said ring, and a suitable planking inclosing said ring.

In witness whereof, I have hereunto set my hand this 14th day of December 1905.

FRANCIS M. HENRY.

Witnesses:

RICHARD PAUL,  
C. MACNAMARA.