

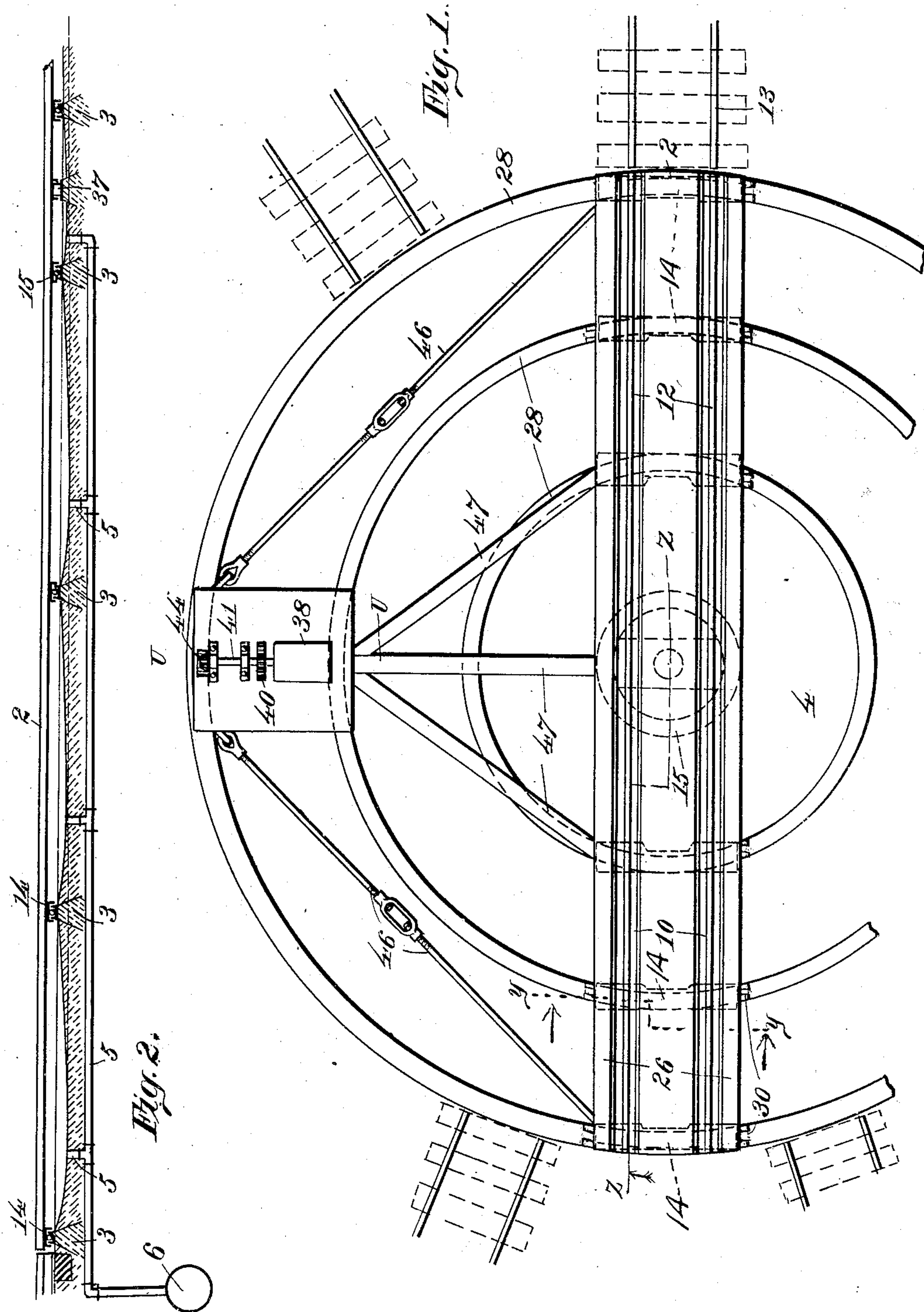
No. 889,370.

PATENTED JUNE 2, 1908.

C. G. HAWLEY.
NORMAL SURFACE TURN TABLE.

APPLICATION FILED SEPT. 24, 1906.

3 SHEETS—SHEET 1.



Witnesses;

H. S. Austin
John R. Lefevre

Inventor;

Charles G. Hawley

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Fig. 3.

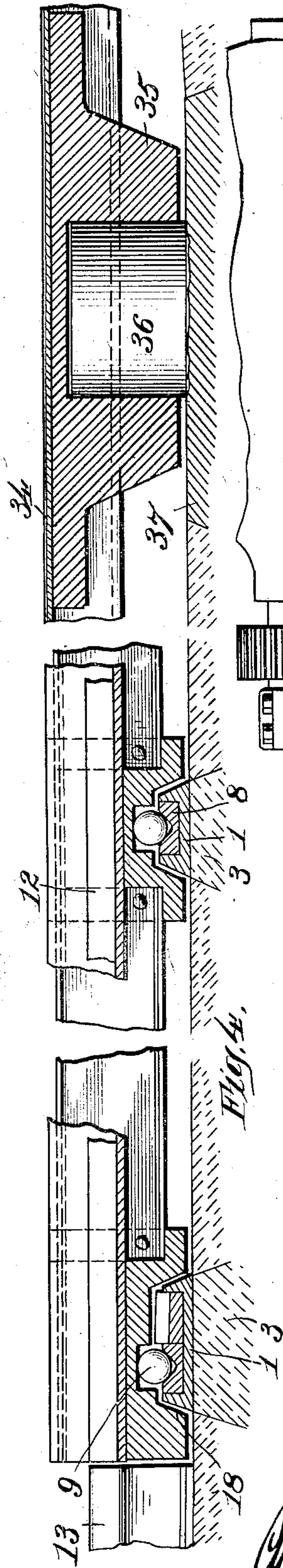
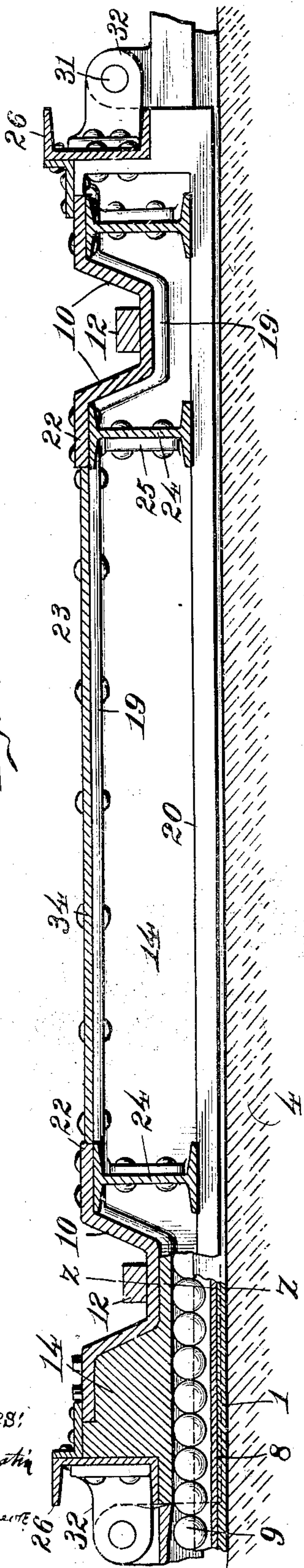


Fig. 4.

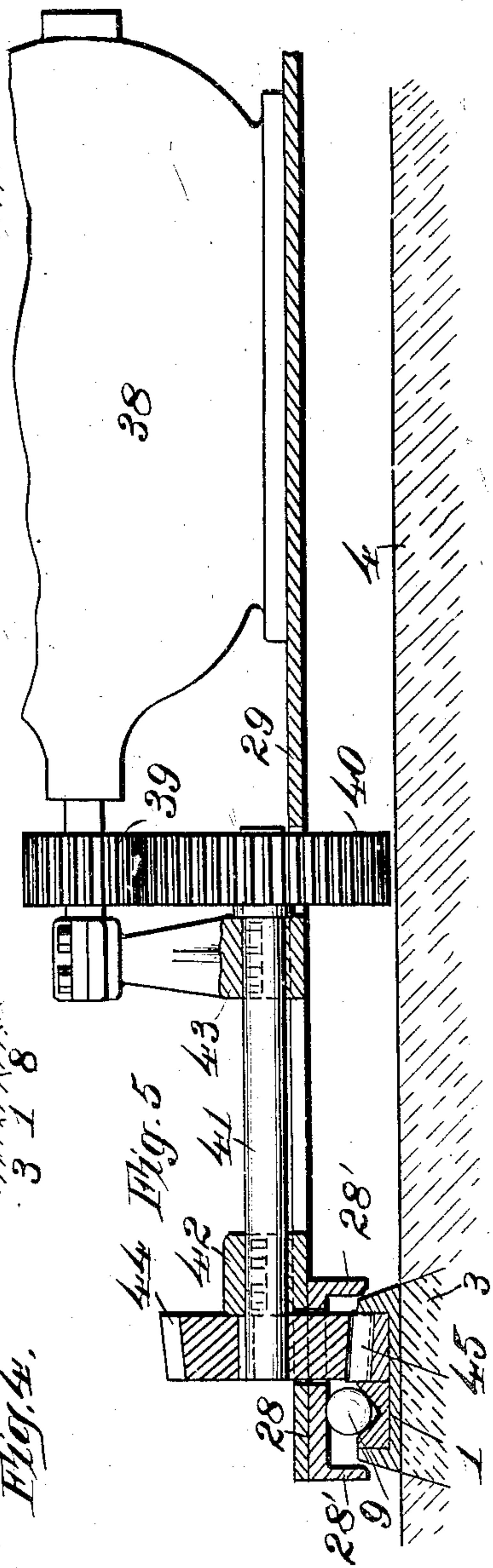


Fig. 5.

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3 SHEETS—SHEET 3.

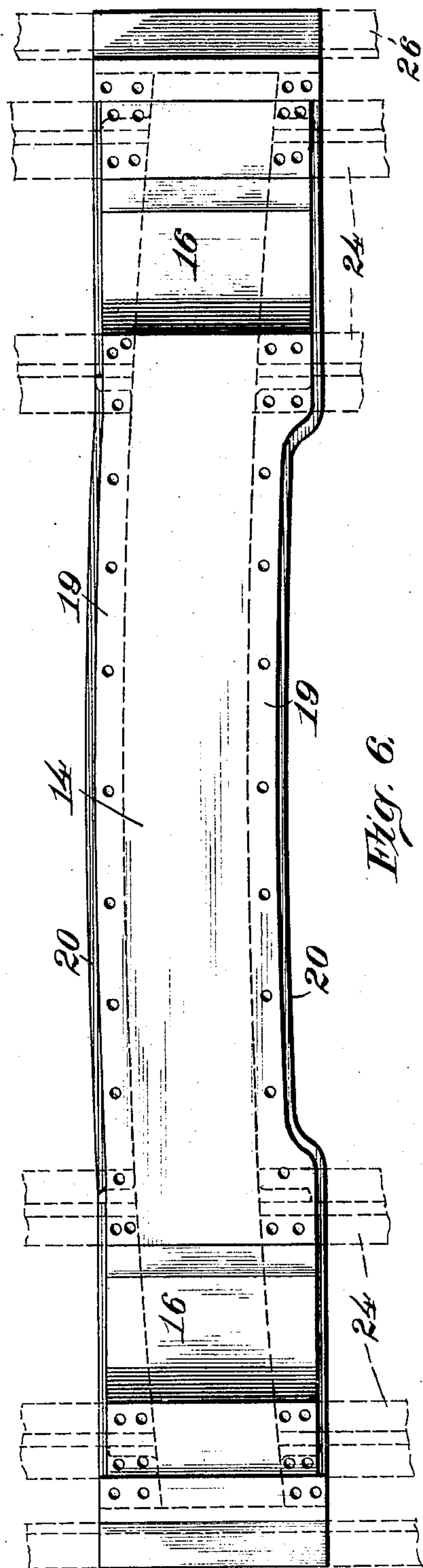


Fig. 6.

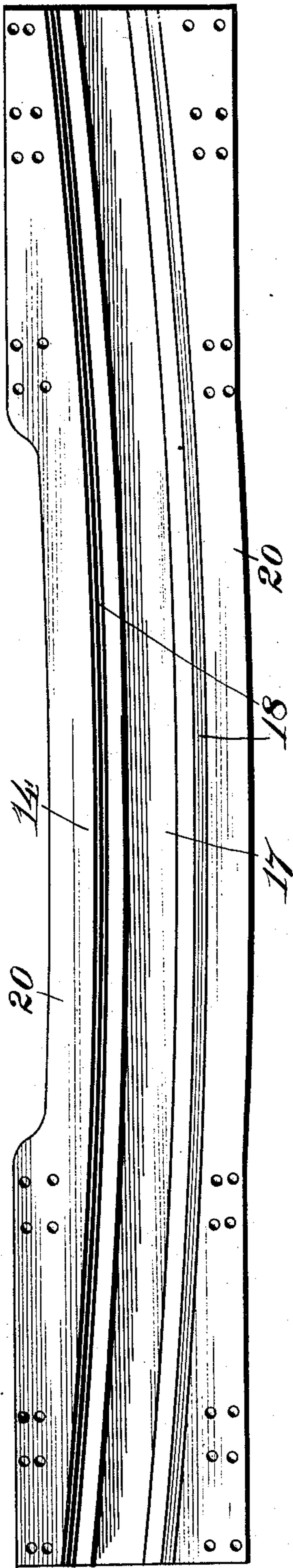


Fig. 7.

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Inventor:

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UNITED STATES PATENT OFFICE.

CHARLES GILBERT HAWLEY, OF CHICAGO, ILLINOIS, ASSIGNOR TO FREDERICK A. GALE,
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NORMAL-SURFACE TURN-TABLE.

No. 889,370.

Specification of Letters Patent.

Patented June 2, 1908.

Application filed September 24, 1906. Serial No. 335,888.

To all whom it may concern:

Be it known that I, CHARLES GILBERT HAWLEY, a citizen of the United States, and a resident of Chicago, Illinois, have invented
5 a certain new and useful Improved Normal-Surface Turn-Table, of which the following is a full, clear, and exact description thereof, such as will enable others skilled in the art to which it appertains to make and use the
10 same.

My invention relates to improvements in railroad turn tables, and has special reference to improvements in normal surface turn tables, that is, such as are so constructed as not
15 to require a pit.

The object of my invention is to provide a railroad turn table which shall be supported by and adapted to turn upon a surface which is either level or substantially level with the
20 surface of the surrounding railroad yard, a primary purpose of the invention being to obviate the construction and use of the usual turn table pit.

Other objects of the invention are to simplify the construction and to lessen the cost of turn tables.

Other objects of the invention will appear hereinafter.

My invention consists generally in a plurality of circular tracks or rails laid in or on the surface of the yard, in combination with a suitable fixed center post or pin, a turn
30 table comprising longitudinal stringers and cross bearers, the latter corresponding to said circular tracks, and a plurality of balls or rollers interposed between said tracks and cross bearers and supporting said table.

Further my invention consists in a structure of the foregoing description wherein ball
40 guides or retainers, substantially co-extensive with said circular tracks, are attached to the turn table.

My invention also consists in novel means for operating turn tables, of the character
45 briefly described.

Further my invention consists in various details of construction and in combination of parts, all as hereinafter more fully described.

The invention will be more readily understood by reference to the accompanying drawings, which form a part of this specification,
50 and in which;

Figure 1, is a plan view of a turn table em-

bodiment of my invention; Fig. 2, is an enlarged vertical section of substantially one-half of
55 the turn table on the line X—X of Fig. 1; Fig. 3, is a still further enlarged transverse vertical section on the irregular line Y—Y of Fig. 1 viewed in the direction of the arrows; Fig. 4, is a longitudinal vertical section showing the parts on the same scale as Fig. 3, as
60 they appear on the line Z—Z of Figs. 1 and 3. Fig. 5, is an enlarged vertical section on the line U—U of Fig. 1, showing the mechanism which I employ for rotating the table; Fig.
65 6, is a top view of one of the cross bearers or transverse members of the turn table; and Fig. 7, shows the same member inverted.

A turn table of the construction herein shown is ordinarily not less than fifty feet in
70 length, and many tables approximate ninety feet in length. The space appropriated to such a table is a circular area of corresponding diameter. The incoming and outgoing tracks to be served by the table approach the
75 latter at different angles and terminate at the edge of the circular surface. The surface of the yard adjacent to the turn table is usually carefully leveled. The incoming and outgoing tracks are laid on the surface, their ties
80 being sunk therein. The turn table surface is usually flush or level with the yard surface and as stated is defined by the swing of the table. It is further defined by a circular
85 rail or track laid in the surface and having its top either flush with or slightly above the yard surface. There are provided a suitable number of such tracks, of different diameters concentrically arranged, their number de-
90 pending upon the length of the table and their spacing being determined by various factors, among which is the size or strength of the channel members or stringers, which support the turn table rails. Said circular
95 tracks are designated 1, 1, in the drawings.

The rails are preferably made of wrought metal and each comprises a flat base portion 1, and two upturned flanges. The rails are mounted on circular foundation walls, 3, that rise to or through the turn table surface. In
100 order that said surface may be kept free of mud and water, it is preferably covered with a layer of cement or concrete, 4, up to the bases of the tracks, 1, 1, and for draining the surface, the annular divisions or portions
105 thereof are concaved or depressed, and from

low points, 4', therein, ducts, 5, lead to a sewer or basin, 6.

A primary purpose of my invention is to make the turn table as low as possible, so that the tops of its rails will be level with the tops of the yard rails. It is for this reason, and with a view to reducing the friction, that I employ comparatively small roller bearings or balls. Where balls are used, I provide annular grooved ball-races, 8, and mount them in the respective rails, 1, 1. Said ball races may be of either wrought or cast metal, and preferably case-hardened. The balls, 9, are laid in the ball-race grooves, preferably in contact, so that they form unbroken rings of balls.

The turn table, designated as a whole by reference character, 2, comprises in its construction, a pair of flanged channel members or stringers, rigidly and solidly connected together, a series of transverse bearers which rest upon the balls, a suitably braced platform carrying the driving mechanism, and a center-pin bearing.

The stringers, 10, are preferably continuous from end to end of the table, and support in their bottoms the two rails, 12, that receive the cars or locomotives from the yard tracks, 13. Said rails are secured to the stringers preferably by riveting.

The cross bearers, 14 and 15, are disposed above the respective tracks, 1, and squarely across the turn table, excepting the central cross bearers hereinafter described. Each cross bearer, 14, consists of a heavy integral casting, comprising a flanged web, provided with depressions or recesses, 16, for the reception of the stringers, 10, and formed in its lower side with an arcuate longitudinal ball-bearing groove, 17, which conforms to the curvature of the circular rail or bearing upon which it moves. Said groove, 17, is formed in the top of a wider groove, having inclined sides, 18. These inclined sides lie close to the inner and outer sides of the rail, and extend nearly to the base thereof, thus excluding dust or obstructions from that portion of the ball-race covered by the cross-bearer. The upper surface of the ball bearing groove, 17, is slightly inclined upwardly toward its end to facilitate its movements upon the balls. The cross bearers, 14, are provided with upper lateral flanges, 19, and with lower lateral flanges, 20; also with end flanges, 21. The stringers, 10, are provided with side flanges, 22, and are secured to the cross bearers, 14, 15, by rivets passing through said flanges, 23, and through the top flanges, 19, of the cross bearers. Said top flanges are conformed to the stringer-recesses, 16, as shown.

The channel stringers are reinforced by longitudinal auxiliary stringers or I beams, 24, which are held in contact with the under

surface of the channel stringer flanges, 22. Said auxiliary stringers, 24, have their ends riveted to lugs, 25, integral with or secured to the sides of the cross bearers, and their ends rest upon the heavy bottom cross bearer flanges, 20. The upper end corners of beams 24, are cut away to let the ends of said beams about the lateral faces or webs of the cross bearers, 14. Thus the portions of stringers, 10, that lie between cross bearers will be relieved or reinforced, when the load comes upon them.

The cross bearers are further rigidly connected longitudinally of the table, by channel or other bars, 26, which are riveted to the end flanges, 21, and may be in separate lengths connecting the cross bearers, or may be continuous, like the channel stringers, 10. The lower flanges of bars, 26, rest upon shoulders or lugs, 27, upon the ends of the cross bearers, or in other words, the ends of the cross bearers are cut away to receive said bars. The cross bearers may be further braced and interconnected by diagonal members, as indicated by dotted lines in Fig. 1.

To protect and retain the balls, 9, within their grooves, where not covered by the cross bearers of the table, I have provided the table with approximately semicircular ball-retainers and protectors, 28; two for each of the circular rails or ball-races. One of these parts is shown in cross section in Fig. 5, at which point it supports the operator's platform, 29. As shown, it comprises a flat top or web, 28, and a pair of depending flanges, 28', which almost touch the edges of the rail; the top or web, 28, having a plane under surface resting on the balls, 9. The ends of the ball-retainers, 28, which lie at the platform side of the turn table are preferably rigidly secured to the ends of respective cross bearers, 14. Those at the other side of the table, however, are so attached to the cross bearers that they may be lifted from off the balls, to permit inspection, or cleaning of the ball-races and also to permit the balls to be placed in their grooves and removed therefrom after the turn table has been installed. A convenient and simple way to permit the lifting of the ball retainers is to pivot their ends, as shown, in Figs. 1 and 3, they are provided with hinge lugs 30, connected by pins, 31, to hinge-lugs, 32, riveted to or cast integral with the cross bearers, 14.

The stringers, 10, and the cross bearers are suitably braced, as by top plates, or braces. As shown, a longitudinal plate, 34, extending the length of the table, is riveted to the top cross bearer flanges, 19. This plate provides a footway for persons crossing the turn table. Above the inner and smaller track, 1, it is better construction to employ a circular cross bearer as 15 than two straight cross bearers, for the stringers, 10. A circular

cross bearer is shown in Figs. 1 and 2, in plan and section respectively. It is provided with depressed recesses to receive the stringers, 10, and is riveted to their flanges, 19, like the straight cross bearers, 14. It is of course provided with ball bearing grooves and with flanges which cover the sides of the circular track thereunder.

Two of the ball retaining arcs, 28, support the operator's platform, 29, which carries either a motor, 38, or a hand-power gear for turning the table. The motor or crank is geared by cog wheels, 39—40, to a radial shaft, 41, held in bearings, 42—43. On the end of shaft, 41, is a bevel driving pinion, 44, which is located above one of the rails, 1, and by preference the largest thereof, so that a smaller driving power is required. Said rail, or its groove is made broad enough to hold in addition to the ball race, 8, the annular rack or gear, 45, as shown in section in Fig. 4. This gear is engaged by the pinion, 44, and is held against rotation by its friction with the holding rail. Locking pins may be used however for positively preventing such rotation:

The driving impulse is transmitted from the platform, 29, to the ends of the turn table by tie rods, 46, connecting the outer portions of the former to the latter. The platform is further braced and held in position by suitable bars such as the arrangement of three bars, 47, shown, with their inner ends connected to three of the cross bearers, and converging toward the platform to which their outer ends are secured. As stated, the platform is supported by two of the arcuate members, 28, which rest upon the roller bearings. The axis of rotation is provided by a center-pin, 36, or its equivalent, either fixed in the turn table surface or secured to the turn table itself. As shown, the pin, 36, is held by a sunken block or casting 37, and the center-pin bearing, 35, is suitably secured to, or made integral with, the center cross bearer, 15. The center-pin serves not only as a fulcrum, but receives the end thrust upon the turn table when rolling stock is moved thereover. Any suitable means for accurately registering and locking the turn table in line with any track, 13, may be employed.

It will be obvious that I may locate the channel-like stringers upon the tops of the cross bearers and thereby avoid notching the latter; but in such cases the table rails are somewhat above the yard tracks, and it is necessary to incline or raise the adjacent ends of the yard rails or tracks. This plan or construction possesses an advantage arising from the fact that rolling stock cannot readily be driven on to the turn table surface; as the inclined ends of the yard rails tend to stop the approach of cars or engines to the turn table.

As various other modifications of my invention will readily suggest themselves to one skilled in the art, I do not limit the invention to the specific construction herein described.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A railroad turn-table comprising a straight track-supporting structure, in combination with a motor platform at the side of the platform and rigidly connected thereto, and circular bearings for said structure and platform; substantially as described.

2. A railroad turn-table comprising a straight track-supporting structure, in combination with circular track and roller bearings for said structure, a circular rack fixed below said structure and concentric with said bearings, a motor platform at the side of and rigidly connected to said structure, and gearing comprising a drive pinion meshing with said circular rack; substantially as described.

3. A railroad turn-table comprising a straight track-supporting structure, in combination with circular roller bearings therefor, a circular rack fixed below said structure and concentric with said bearings, a motor platform rigidly connected to said structure and supported by said bearings, and gearing comprising a drive pinion meshing with said rack; substantially as described.

4. The combination with a turn-table mounted on roller bearings, of upwardly movable retainers and protectors concentric with and covering said bearings and carried by the turn-table; substantially as described.

5. A straight track-supporting structure in combination with circular roller bearings therefor and arcuate roll retainers and protectors carried by said structure and covering those portions of the bearings not covered by the track-supporting structure; substantially as described.

6. A railroad turn-table comprising a plurality of metal cross bearers, each provided with two depressed portions, in combination with a pair of channeled track-supporting stringers resting upon and secured to said cross bearers within said depressed portions; substantially as described.

7. A railroad turn-table comprising a plurality of metal cross bearers, each provided with two depressed portions, in combination with a pair of channeled track-supporting stringers resting upon and secured to said cross bearers within said depressed portions, and longitudinal members for reinforcing said stringers; substantially as described.

8. A railroad turn-table comprising a plurality of metal cross bearers, each provided with two depressed portions, in combination with a pair of channeled track-supporting stringers resting upon and secured to said

cross bearers within said depressed portions, and continuous longitudinal members secured to the ends of said cross bearers and reinforcing said stringers; substantially as described.

9. A railroad turn-table comprising a plurality of metal cross bearers, each provided with two depressed portions, a pair of flanged channel stringers resting upon and secured to said cross bearers within said depressed portions, and auxiliary stringers underlying the flanges of said channel stringers and secured to the cross bearers; substantially as described.

10. In a normal surface turn table, a metal cross bearer comprising a body or web having transverse recesses to receive channel stringers, and having top and bottom longitudinal flanges for attachment to said stringers and other members; substantially as described.

11. In a normal surface turn table, a metal cross bearer comprising a body or web having transverse recesses to receive channel stringers, and having top and bottom longitudinal flanges and end flanges for attachment to said stringers and other members; substantially as described.

12. A normal surface turn table comprising a straight track supporting structure provided with metal cross bearers each having a body or web and a longitudinal, curved, roller bearing way or race in its lower side; substantially as described.

13. A normal surface turn table comprising a plurality of metal cross bearers, and having longitudinal, curved, roller bearing recesses in their under sides, in combination with a pair of channel stringers secured to and resting on said cross bearers, and rails laid in the channels of said stringers; substantially as described.

14. A normal surface turn table comprising a pair of rail supporting channel stringers and centrally disposed annular cross bearings thereunder, and a plurality of spaced, straight cross bearers, all the cross bearers being rigidly secured to said stringers and having curved roller bearing grooves in their lower sides; substantially as described.

15. A normal surface turn table comprising a pair of rail supporting channel stringers and a centrally disposed annular cross bearer thereunder, a center pin bearing, a center pin, and a plurality of spaced, straight cross bearers, all the cross bearers being rigidly secured to said stringers and having curved roller bearing grooves in their lower sides; substantially as described.

16. A normal surface turn table comprising a plurality of metal cross bearers, a pair of channeled rail supporting stringers resting on and secured to said cross bearers, and a

longitudinal plate riveted upon said cross bearers and extending between said stringers; substantially as described.

17. A normal surface turn table comprising a plurality of metal cross bearers having top and bottom longitudinal flanges, in combination with a pair of flanged channel stringers resting on and secured to said top flanges, and auxiliary stringers underlying the flanges of the channel stringers to reinforce the same and having their ends secured to said cross bearers; substantially as described.

18. A plurality of spaced concentric tracks provided with roller bearings, in combination with a turn table comprising a plurality of metal cross bearers alined with said tracks, said cross bearers having curved roller bearing grooves, a pair of flanged channel stringers resting on and secured to said cross bearers, lateral continuous bars secured to and connecting the ends of the cross bearers, and reinforcing members supporting the flanges of said stringers, said reinforcing members being supported by the cross bearers; substantially as described.

19. The combination of a circular roller bearing track, rollers mounted thereon, and a turn table comprising a cross bearer alined with said track, said cross bearer having a track groove of the same curvature as the track and sufficiently deep to overhang the same, the upper portion of said groove being provided with a roller bearing surface; substantially as described.

20. The combination of a circular roller bearing track, rollers mounted thereon, and a turn table comprising metal cross bearers alined with said track, each cross bearer having a track groove of the same curvature as the track and sufficiently deep to overhang the same, a portion of said groove being deepened to form a roller bearing groove; substantially as described.

21. The combination with a turn table and a circular roller bearing track therefor, of rollers held by said track, and an arc shaped retainer and protector conforming to the bearing, resting on said rollers, and carried by the turn table; substantially as described.

22. The combination with a turn table and a circular roller bearing track therefor, of rollers held by said track and a semicircular retainer and protector conforming to the bearing, resting on said rollers, and carried by the turn table; substantially as described.

23. The combination of a plurality of concentric roller bearing tracks, a turn table, and a platform upon said tracks, table driving mechanism on said platform, and arc shaped bearing protectors and retainers carried by the turn table, said platform being supported by one or more of said retainers; substantially as described.

24. A circular rail of channeled section disposed with the channel upward, and a ball holding ring and an annular rack held within the channel of said rail; substantially as described.

25. A circular rail having two up-turned flanges, a ball holding ring, and an annular rack held between said flanges, a turn table, a motor platform, a motor thereon, and a

drive pinion driven by the motor and engaging the rack; substantially as described.

In testimony whereof, I have hereunto set my hand, this 30th day of August, 1906, in the presence of two subscribing witnesses.

CHARLES GILBERT HAWLEY.

Witnesses:

JOHN R. LEFEVRE,
F. G. KNIGHT.