

(No Model.)

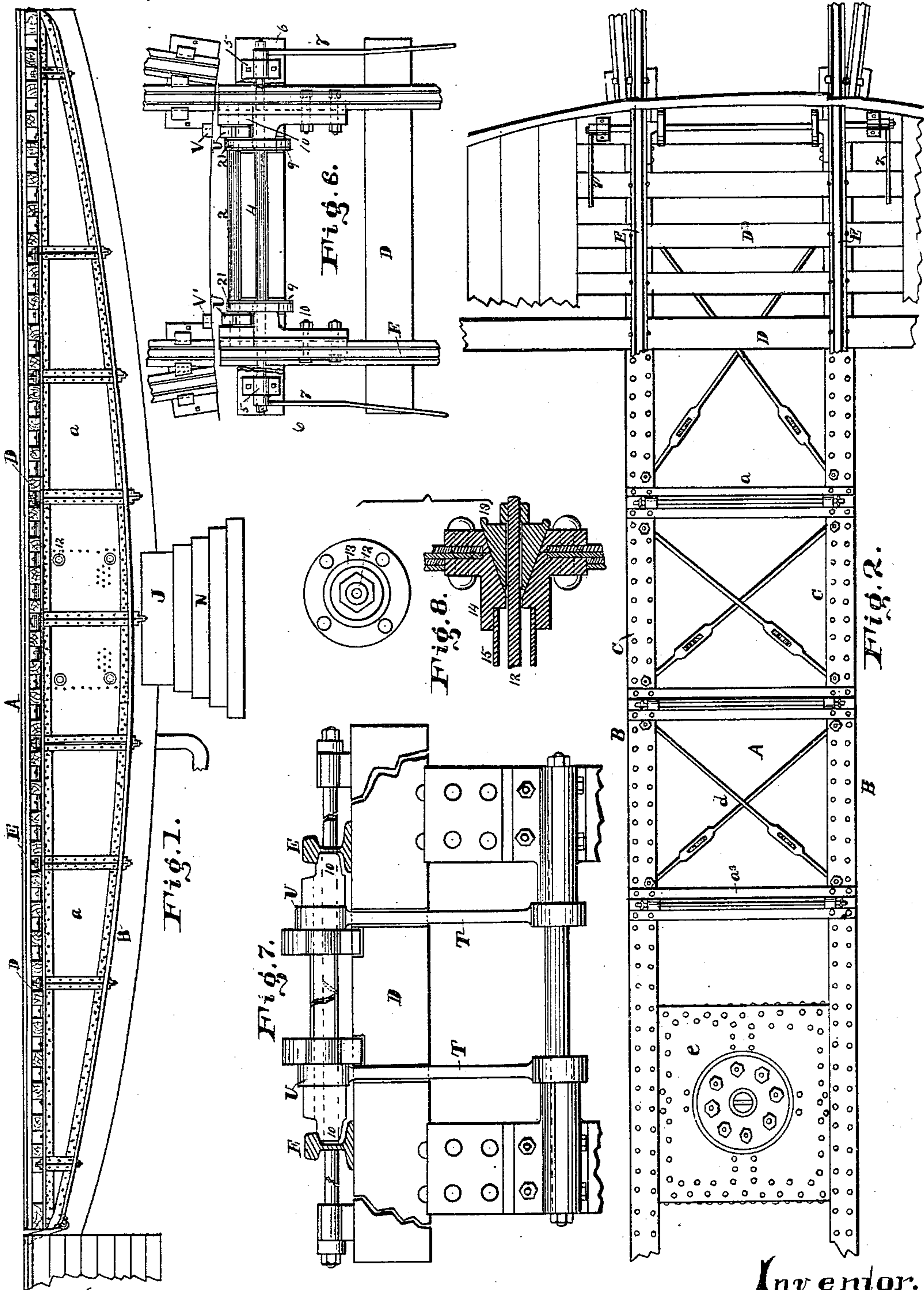
2 Sheets—Sheet 1.

C. A. GREENLEAF.

TURN TABLE.

No. 259,305.

Patented June 13, 1882.



Attest.  
E. R. Hill,  
J. M. Stahl.

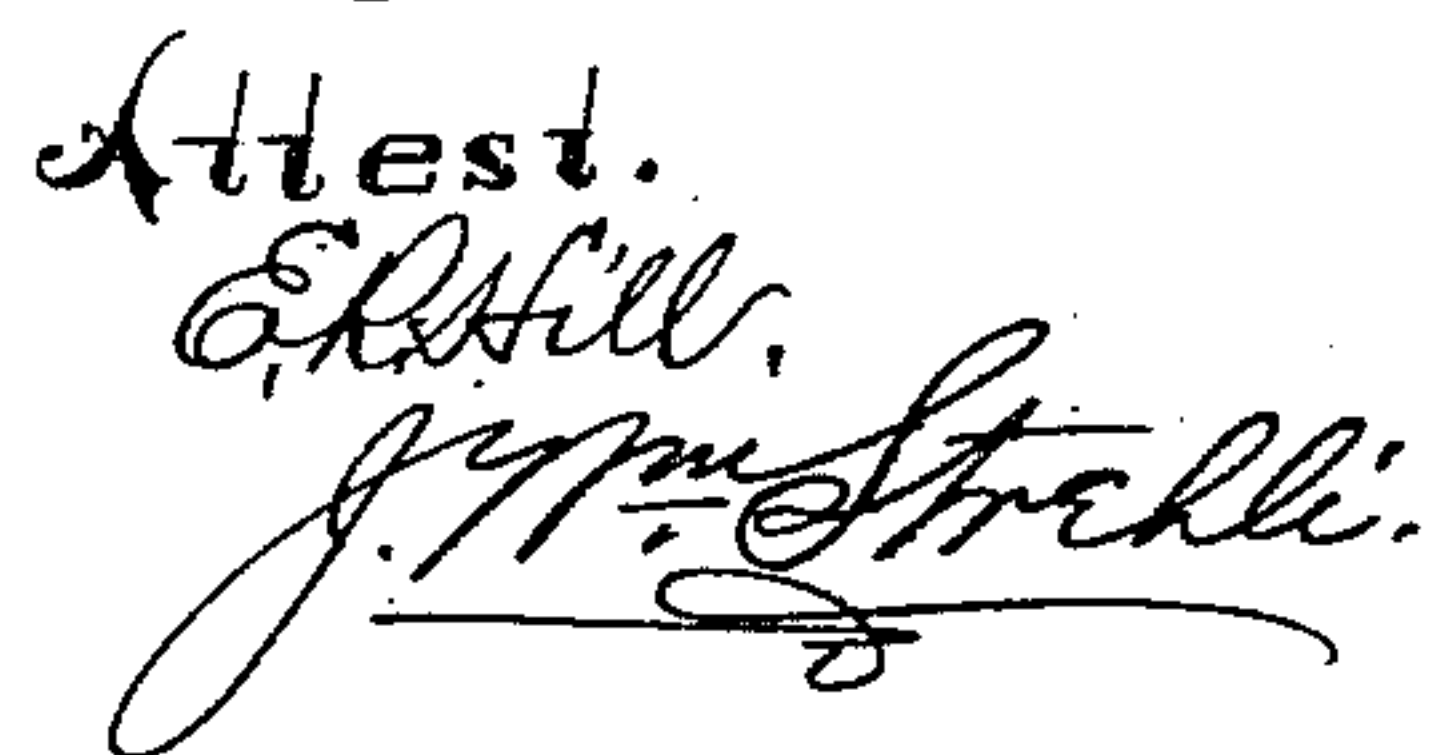
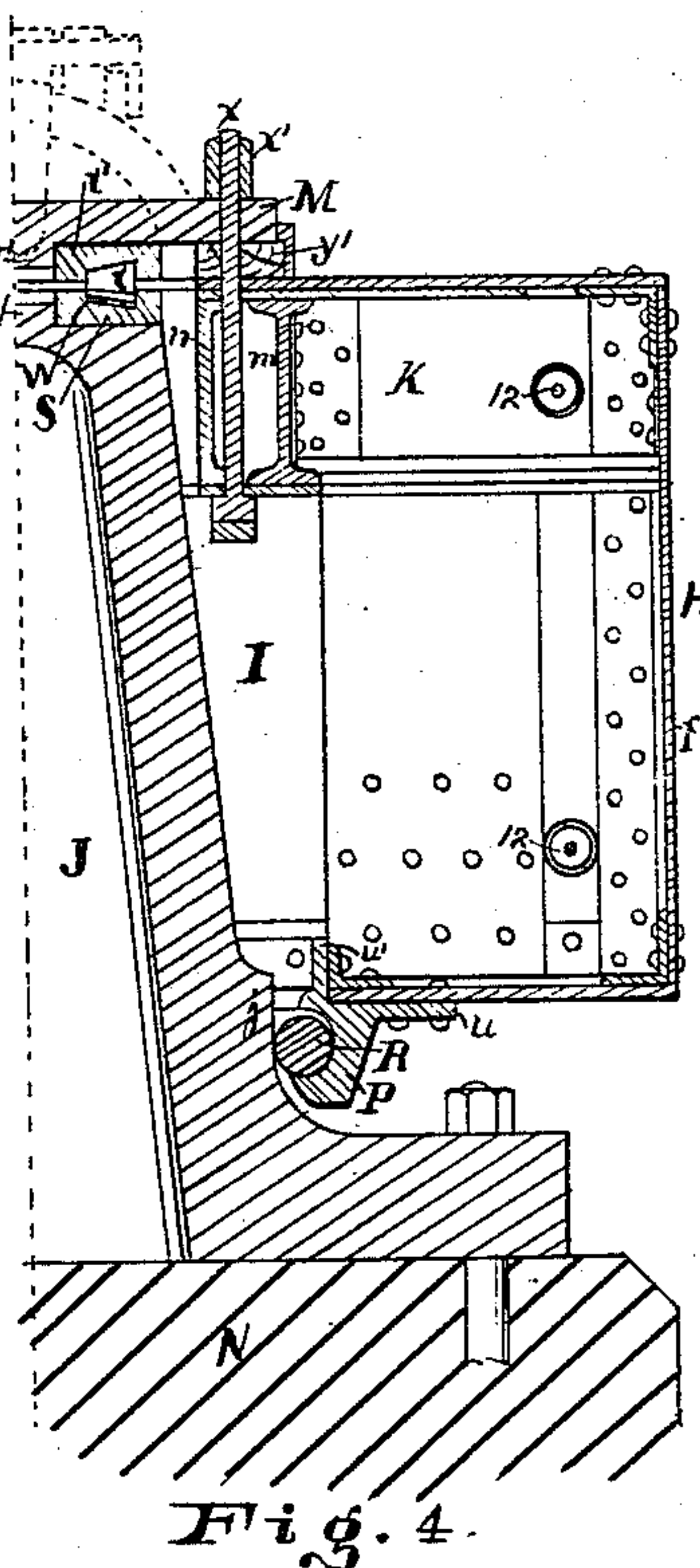
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2 Sheets—Sheet 2.

TURN TABLE.

Patented June 13, 1882.



Inventor.  
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# UNITED STATES PATENT OFFICE.

CLEMENTS A. GREENLEAF, OF INDIANAPOLIS, INDIANA.

## TURN-TABLE.

SPECIFICATION forming part of Letters Patent No. 259,305, dated June 13, 1882.

Application filed January 17, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, CLEMENTS A. GREENLEAF, of the city of Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Turn-Tables, of which the following is a specification.

My invention, in general, consists of a turn-table which, while being operated as such, is entirely supported upon a central pedestal, as hereinafter set forth.

Various forms of mechanisms may be supplied to carry into effect my invention.

A prominent feature of my invention consists in the particular mechanism I have originated for keeping the track of said turn-table in a horizontal plane while said turn-table is being turned around.

Certain subordinate features of my invention consist of those portions of this mechanism which I have invented, and which serve to assist in keeping the top of the turn-table in a horizontal plane.

Various devices may be supplied to support the ends of the turn-table and to prevent the rotation of the latter while the load is passing off or on. One description of said end-supporting device and one description of locking device, both invented by me, constitute subordinate features of my invention. Other subordinate features of my invention will be noticed hereinafter.

The objects and advantages of my invention will be fully apparent from the following description.

In the accompanying drawings, making a part of this specification, Figure 1 is a side elevation of a turn-table embodying my invention, the sides and bottom of the pit within which the turn-table revolves being shown in section.

Fig. 2 is a top view of the central box and one half of the turn-table and the edge of the pit adjacent thereto, the other half of the turn-table being broken away. Fig. 3 shows a central vertical transverse section of the turn-table and its supporting-pedestal. Fig. 4 shows a central vertical longitudinal section of one half of the box and the said pedestal. Fig. 5 is a side elevation of the end of the turn-table and that portion of the pit adjacent thereto, and showing that description of device which I have in the present instance adopted to sup-

port and lock the ends of the table while the load is passing on or off the latter. Fig. 6 is a top view of the devices shown in Fig. 5. Fig. 7 is an elevation of the end of the turn-table and of the locking and supporting devices alluded to in the description of Fig. 5; and Fig. 8 shows an outside elevation of the counter-sunk washer and bolt, and below this elevation shows a vertical central section of same.

A indicates the turn-table, which is to be so constructed as to be considered and to act as one beam—in other words, be so constructed as to resist diagonal deflection of the structure. A desirable mode is to construct two truss-beams, B B, provided with and stiffened by a central box stiff enough to securely support the weight of the turn-table and its load. In the present instance the two truss-beams B are each composed of the vertical plates *a*, of wrought-iron, united together by angle-irons bolted to the vertical edges of adjacent plates. Angle-irons are bolted to these plates at the top and bottom, and to these angle-irons are bolted the horizontal plates C, upon the upper set of which rest the cross-ties D, which in turn carry the track E. Vertical plates located between the trusses and transversely to the latter are bolted to angle-irons, which in turn are bolted to the plates *a*. Angle-irons are secured by bolts to the vertical transverse plates at the top and bottom of the latter, and to the top and bottom edges of the said plates are secured the horizontal plates *a*<sup>3</sup> by being bolted to the last-mentioned angle-irons. Cross-stays *d* connect those corners of the rectangular box formed between the plates *a* and adjacent transverse plates, and which are diagonally opposite, said cross-stays being bolted at their ends to the truss-beams B, and thus further strengthen the combined trusses.

At the center of the turn-table the usual cross-partition connecting the truss-beams is omitted, and the box H is employed to connect the two truss-beams. There are various modes in which this box can be properly constructed. A very useful one is the following: A top plate, *e*, bottom plate, *e'*, end plates, *f*, and side plates, *g g'*, are secured together by means of appropriate angle-irons. Within the shell I, thus formed, vertical cross-plates K, whose top edges lie directly beneath and adjacent to the top plate, *e*, are attached by



angle-irons and bolts to the sides and to the I-beams  $m$ , having their webs vertical. These beams  $m$  are attached together by suitable angle-irons, and form a rectangular shell within the outer shell, already described. Within this inner shell is an annular vertical brace,  $n$ , whose upper edge lies underneath and against the top plate,  $e$ . Placed underneath and lying against the bottom edges of this shell and of annular brace  $n$  is the horizontal plate  $p$ . The top plate,  $e$ , and bottom plate,  $e'$ , of the shell I are centrally cut away, as shown, to admit of the introduction therein of the pedestal J and its necessary accompanying devices. Upon the top of the pedestal lies a ring, S, provided in its upper side with a circular runaway, W, the bottom of which latter is beveled down from within outward for receiving the conical rollers  $t$ , which roll therein. A vertical central projection, V, of the pedestal, closely fitting the central opening of the ring, serves to prevent any lateral movement of said ring. A similar ring,  $t'$ , is provided at its lower side with a groove or runaway, W', the back or bottom of which latter is deepened from within outward. This runaway W' receives the conical rollers, as shown. Upon the top of this ring rests an annular plate, M, provided with a vertical projection,  $v'$ , which closely fits the annular opening in ring  $t'$  and prevents the plate M from moving laterally. Vertical bolts  $x$ , passed at intervals through the plate  $p$  and top plate,  $e$ , and plate M, are secured in position by nuts  $x'$ . It will be observed that these bolts support the weight of the entire turn-table, inasmuch as the box H rests upon them and they rest upon the plate M. The space between this plate M and the top plate,  $e$ , is usually occupied by a wooden filling,  $y$ , surrounded and capped by the metallic rim  $y'$ .

To prevent the box H being strained laterally and the trusses from diagonal deflection, the diagonal brace-plates  $z$  are introduced and secured, as shown. The box H is firmly bolted to the beams B by the stay-bolts 12, which pass through the entire box and the beams, and are secured in position by nuts. To prevent the end of the stay-bolts being cut off by the shearing action of the beams B when a load strikes the end of the turn-table, I interpose a countersunk washer, 13, of a novel construction, and a socket, 14, which secures said washer between the stay-bolt and the adjacent edge of the bolt-hole through the beam. The inner end of the socket 14, in which the countersunk washer is received, is secured onto a pipe, 15, which surrounds the stay-bolt for the whole of the distance through the box. The pedestal rests upon and is firmly secured to a suitable solid foundation, as N, in the usual manner. At the edge of the central orifice in the bottom plate,  $e'$ , and secured to the latter, is an annular roller-carrier, P, provided with horizontal flange  $u$ , bolted to the under side of said plate, and vertical flange  $u'$ , bolted to an

angle-iron,  $u^2$ , which latter is in turn bolted to the top of said plate.

The connections between the wrought-iron plates and the angle-irons aforementioned can be and often are preferably made by means of rivets instead of by bolts and nuts; but this remark does not apply to the bolts  $x$  nor the bolts 12. A groove, P', in the carrier P contains and supports the rollers R. These rollers are in the present instance spherical and roll against and between the surface of the groove P' and the lower face,  $j$ , of the pedestal J. The sides of the box H and the plate  $e'$  operate as a brace, which rests against the side of the pedestal, and which, for the purposes of illustration, will be designated by the numeral 20. These rollers are in the present instance spherical, but may be conical or cylindrical, &c., as desired, care being taken that they are so arranged and fitted to a proper groove in carrier P that they shall roll easily and without friction upon the face of the pedestal.

A turn-table thus constructed is supported by and free to turn upon the central pedestal, J, is sufficiently stiff to resist deflection while bearing and turning with the load, and is prevented from tipping in any direction by resting against the lower portion of the pedestal and employing the latter as a brace and support against the tendency of such a table to tip. The presence of the rollers R makes the use of the lower part of the pedestal as a brace, as aforementioned, practical, for the reason that they obviate such friction at the point where the turn-table would impinge against the lower portion of said pedestal as would tend to interfere with the easy operation of the table.

The feature of my invention above described enables me to dispense with any end support for turn-tables—such as wheels and an annular track in the pit, as used in a majority of turn-tables now in use—and also to construct my turn-table so as to be perfectly rigid. An additional advantage which I obtain by removing the wheels and employing the lower portion of the pedestal as a brace to prevent the turn-table from tipping consists in the fact that the turn-table is more easily turned, the resistant friction of the rollers R at the pedestal—that is, near the center of the circle described—being much less than the resistant friction of rollers operating at the ends of the turn-table.

As the principal feature of my invention consists in a non-deflectable turn-table turning upon and supported (while turning) upon a central support, combined with a non-frictional brace resting against the lower portion of the pedestal and preventing the turn-table from tipping, it is evident, therefore, that any suitable form of mechanism at the upper end of the pedestal for enabling the turn-table to be readily rotated thereon may be employed in connection with such a construction of the turn-table that the lower portion of the pedestal is made to serve



as a brace to prevent the turn-table from tipping.

By way of illustration, in cases where it is desirable to elevate the point upon which the table oscillates, and thereby lower the center of gravity and enable the table to be kept more readily in balance when the locomotive is upon it, the modification shown by dotted lines in Fig. 3 may take the place of the flat plate M. In other words, for the flat plate M may be substituted the concave hemispherical plate F, provided with an annular flange, through which pass the bolts  $x$ , secured by nuts  $x'$ , as aforesaid. This hemispherical plate F incloses and rests upon a hemispherical piece, 18, which rests upon the ring  $t'$ , and has a projection,  $v'$ , which enters the central circular opening in the ring and prevents lateral displacement of the said piece 18.

Any suitable devices for locking the turn-table opposite any desired track may be employed in connection with the aforementioned feature of my invention; also any suitable device for supporting the edge of the turn-table while the load is passing on or off the said table.

I have invented new and useful devices for simultaneously locking the turn-table, and also for supporting the latter during the reception or delivery of its load. These devices are of the following-described construction, to wit:

At either end of the turn-table are placed a couple of vertical locking arms or stirrups, T, at bottom hinged or journaled on the bearing T', which latter is attached to the turn-table, as shown. These front portions of the upper end of each of these locking arms or stirrups T are provided with a semicircular projection, U, which, when the arm is advanced to the side of the pit, enters a recess, V', provided for same between the rails of the track opposite which the turn-table is to be locked, each projection U resting upon the bottom of its respective recess and supporting the end of the turn-table.

The preferable means to be employed to advance the arm T to the recess V', and to retract it therefrom, is a yoke, 21, which at one end receives a journal-pin, 2, extending from the side of the upper portion of arm T, and at the other end receives in a circular recess an eccentric, 3, fixed upon a shaft, 4, journaled in bearings 5, fixed to the tie 6. To each extremity of the shaft 4 is fixed a lever, 7, which, when the arm T is retracted, lies down flat upon the ties, as shown in Fig. 6. The circular recess of the yoke 21 closely fits the eccentric 3, and a guard-plate, 9, attached to the inner side of the eccentric, prevents the eccentric from slipping out of the recess through the opening whereby it entered therein.

The locking device consists of two tongues or locking studs, 10, one of which is connected to the outer side of the upper portion of each locking-arm T and just inside of the adjacent rail on the turn-table, so that when the latter arm is advanced the locking-stud 10 will also

be moved forward and the front portion of the stud pass inside of the end of that rail located on the edge of the pit, and opposite that rail on the turn-table which is adjacent to the said stud. Inasmuch as there are two locking-studs, and they lie between and against the rails of the turn-table and the rails opposite to the track on the turn-table, it is evident that they will prevent the turn-table from rotating and keep the respective rails of the track on the turn-table and of the opposite track on the edge of the pit in line.

The method of operating the foregoing supporting and locking device is as follows: The load is run onto the table, and the levers 7 are then moved over and toward the center of the turn-table and laid down flat on the ties, as shown in Fig. 6. By this movement the eccentric 3 is rotated and the arms T and locking-studs are retracted to the table, as shown in Fig. 6. The turn-table is now wholly unsupported everywhere except at the pedestal, and is turned with great ease till the track thereon is opposite that track on the edge of the pit on which it is desired to deliver the load. The levers 7 are then lifted and moved over toward the edge of the pit, thereby simultaneously advancing the locking-arms T and the locking-studs 10, and causing the projections U of the arms T to enter their respective notches V' in the edge of the pit, and the studs 10 to pass inside of and against the rails, thereby locking the turn-table, keeping the track thereof in line with the track on the edge of the pit, and also firmly supporting the edge of the turn-table. The load is now run off the turn-table.

The above operation of unlocking and locking, &c., the turn-table is repeated whenever the turn-table is to be shifted.

The recesses V' may be placed outside the rails, the arms or their projections being altered so that the projections U shall readily enter said recesses.

The device for supporting the ends of the turn-table may be used without the particular description of locking device herein shown, and, in fact, may be used with any other desirable description of locking device.

The locking device may also be employed without the device for supporting the ends of the turn-table, and may be advantageously employed where the ends of the turn-table are supported on wheels located near said ends and rolling on a suitable track.

The locking devices or the said devices for supporting the ends of the turn-table, or both of said devices, may be permanently located on the side of the pit, and where such is the situation of the said supporting device the recesses V' will be made in the ends of the turn-table and occupy a position in relation to the rails of the table similar to that which they (said recesses) occupy in relation to the rails of the pit.

What I claim as new and of my invention, and desire to secure by Letters Patent, is—



1. The combination of a turn-table, provided with mechanism for enabling it to rotate on a central pedestal, and provided with brace 20, having groove P', rollers R, and said pedestal  
5 provided with surface j, substantially as and for the purposes specified.

2. The combination of a turn-table provided with mechanism for enabling it to rotate on a central pedestal, and provided with brace 20,  
10 having groove P' and rollers R, and locking devices, and devices for supporting the turn-table while the load is passing off or on, substantially as and for the purposes specified.

3. The combination of a non-deflectable turn-  
15 table, provided with box H, and plate M, and ring t', rollers t, pedestal J, and ring S, and rollers R, substantially as and for the purposes specified.

4. The combination of a non-deflectable turn-  
20 table and box H, and plate M, and ring t', rollers t, pedestal J, and ring S, and rollers R, and devices for locking the turn-table and for supporting the turn-table while the load is passing on or off the turn-table, substantially as and  
25 for the purposes specified.

5. The device for supporting the turn-table while the load is passing on or off the latter, and consisting of the oscillating arms T, provided with projections U, mechanism for ad-  
30 vancing and retracting said arms, and a pit provided with recesses V', substantially as and for the purposes specified.

6. The device for supporting the ends of the turn-table, consisting of the oscillating arms T,  
35 provided with projections U, pivoted at T' to the trusses B, eccentric yokes 21, eccentrics 3, shaft 4, and levers 7, substantially as and for the purposes specified.

7. The device for locking the turn-table, con-

sisting of the oscillating arms T and locking- 40 studs 10, substantially as and for the purposes specified.

8. In combination, the oscillating arms hav- ing projections U and locking-studs 10, mech-  
anism for advancing and retracting said arms, 45 and the pit provided with recesses V', substantially as and for the purposes specified.

9. In combination, the oscillating arms piv-  
oted at T' to the turn-table, and having projec-  
tions U and locking-studs 10, and the eccen- 50 tric yokes 21, eccentrics 3, shaft 4, and levers 7, substantially as and for the purposes speci-  
fied.

10. In combination, a turn-table turning on a central pedestal, brace 20, anti-friction roll- 55  
ers R, and locking device consisting of the os-  
cillating arms having projections U, and mech-  
anism for advancing and retracting said arms,  
substantially as and for the purposes specified.

11. In combination, a turn-table turning on a central pedestal, brace 20, anti-friction roll- 60  
ers R, and device for supporting the ends of  
the turn-table when locked, and consisting of  
the oscillating arms having projections U, and  
mechanism for advancing and retracting said 65  
arms, substantially as and for the purposes  
specified.

12. In combination, a turn-table turning on a central pedestal, brace 20, anti-friction roll-  
ers R, oscillating arms T, provided with pro- 70  
jections U, locking-studs 10, and mechanism  
for advancing and retracting said arms, sub-  
stantially as and for the purposes specified.

CLEMENTS A. GREENLEAF.

Witnesses:

FRANCES C. GREENLEAF,  
L. CHRISTIAN.