

(No Model.)

3 Sheets—Sheet 1.

J. D. BOWMAN.

TURN TABLE.

No. 389,541.

Patented Sept. 18, 1888.

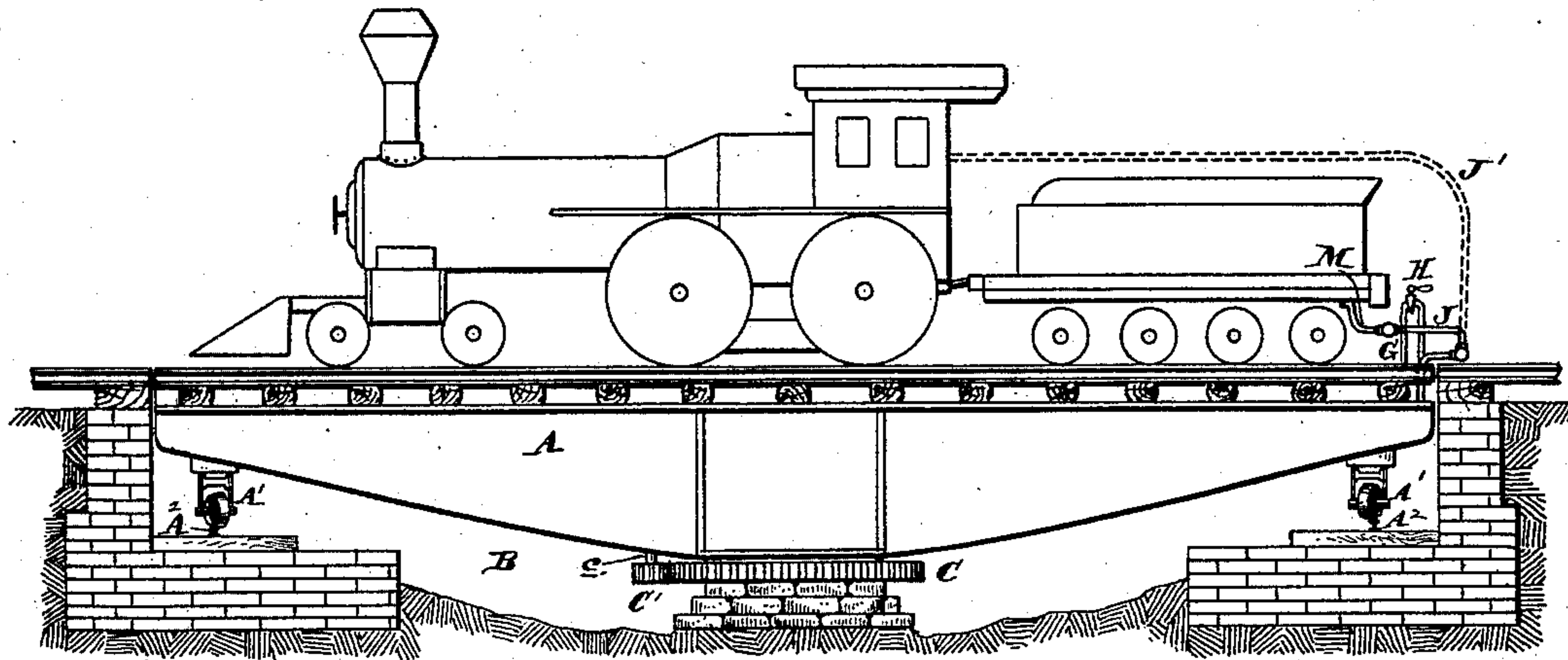


FIG. 1

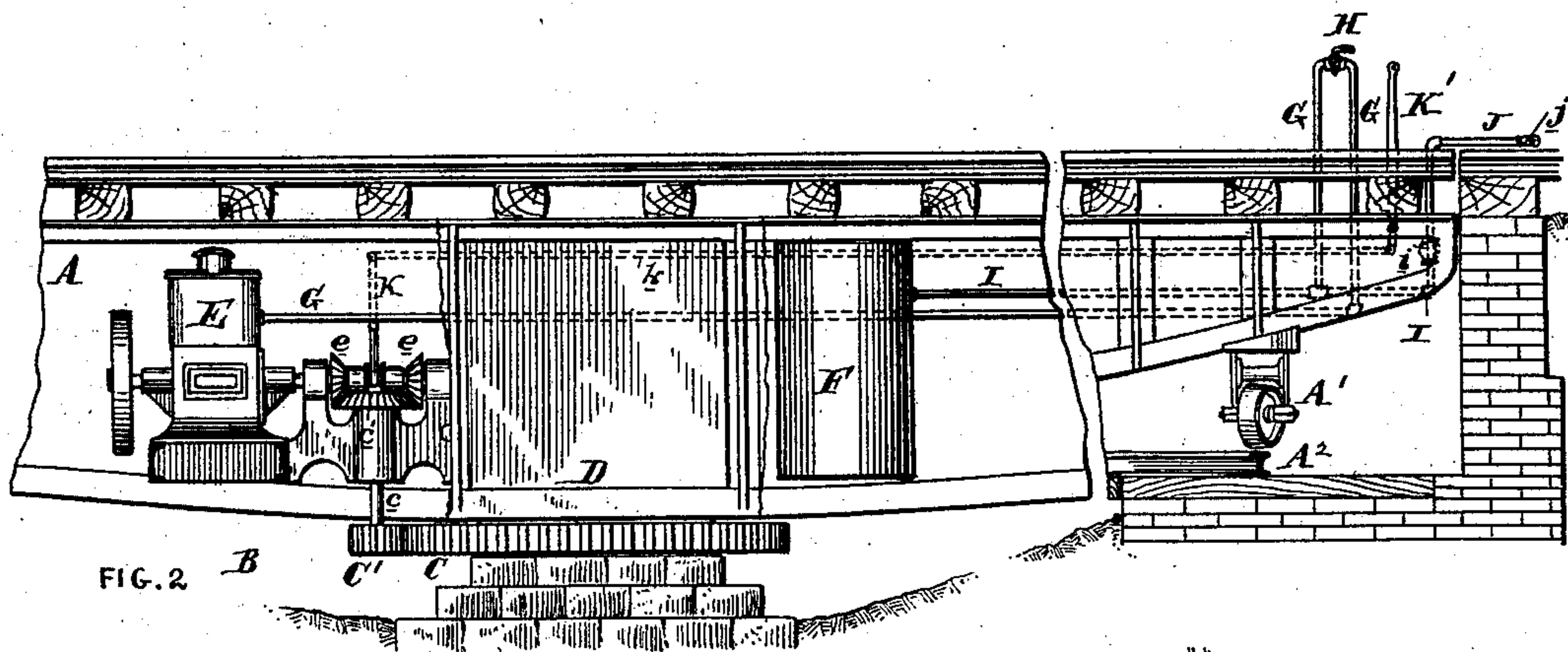


FIG. 2

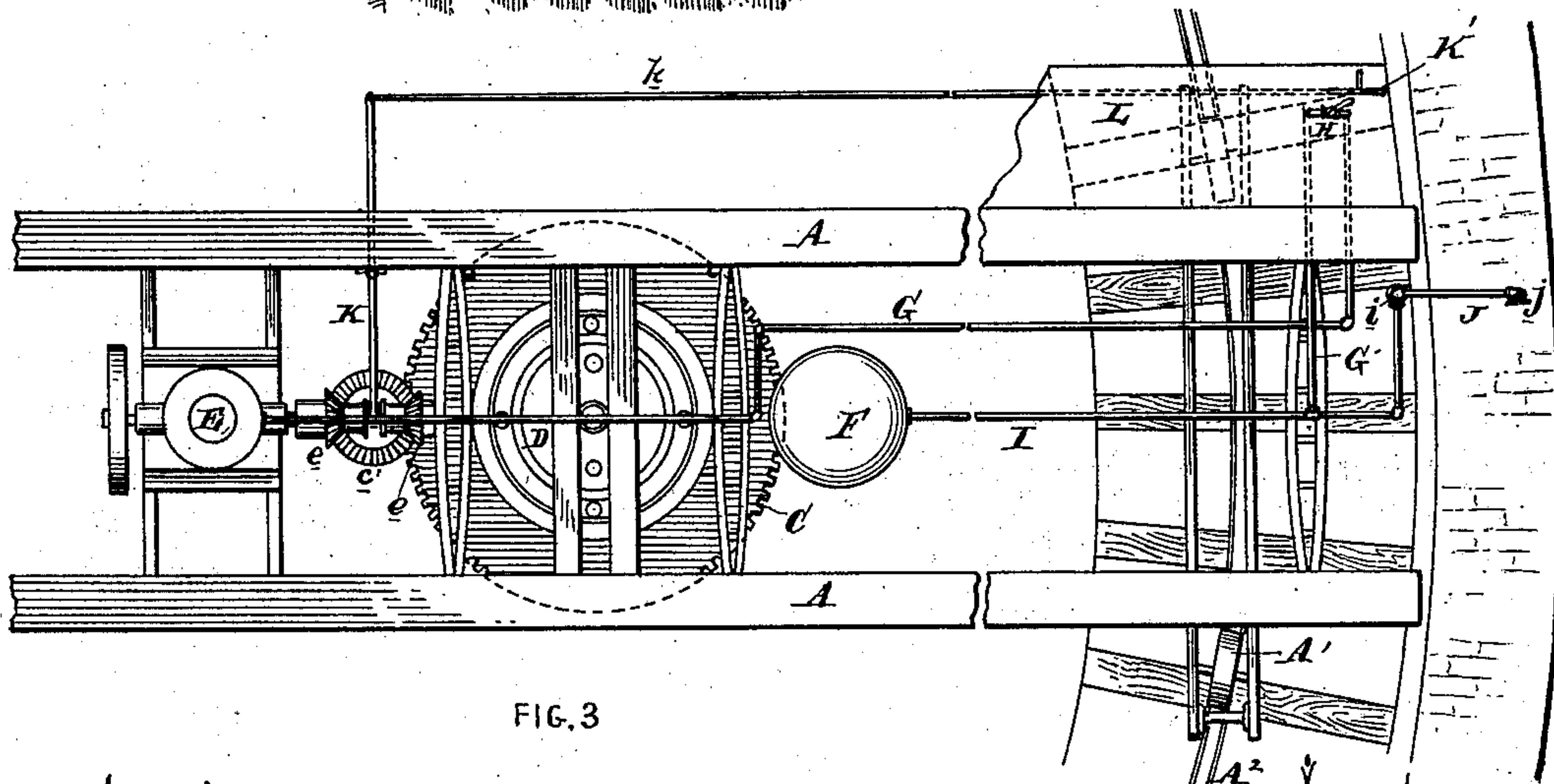


FIG. 3

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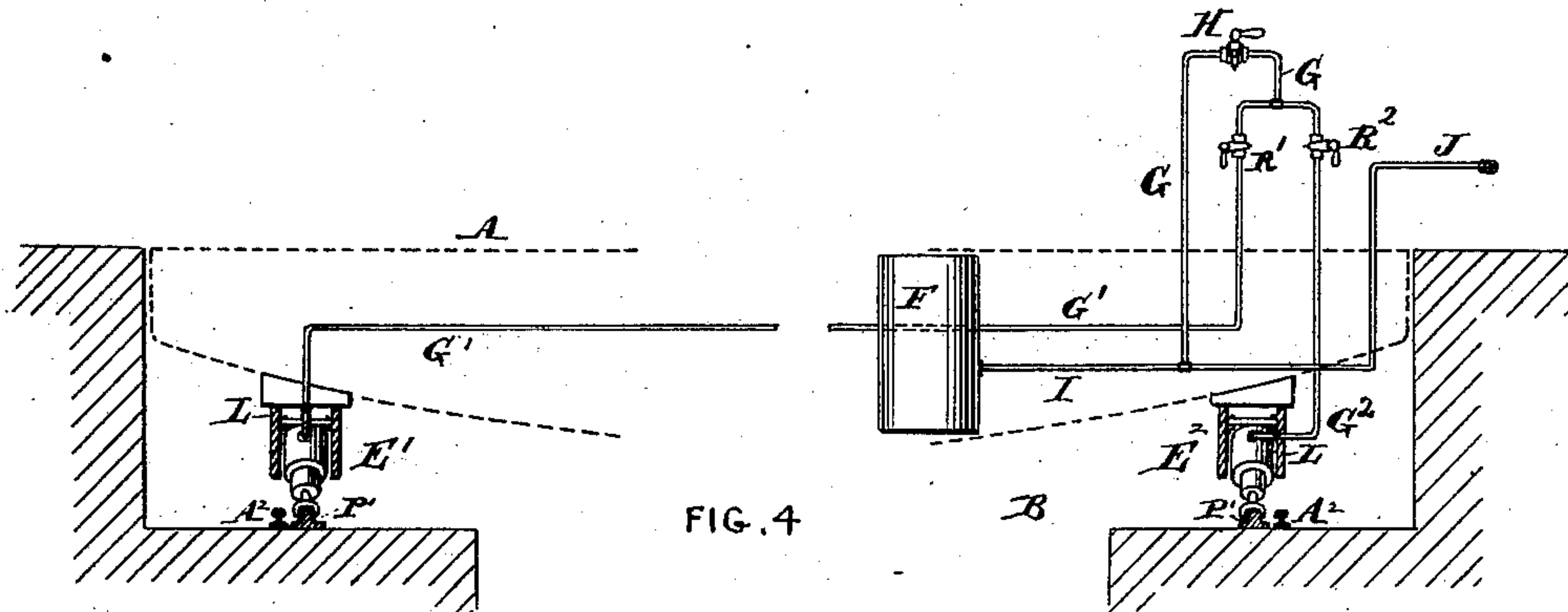


FIG. 6

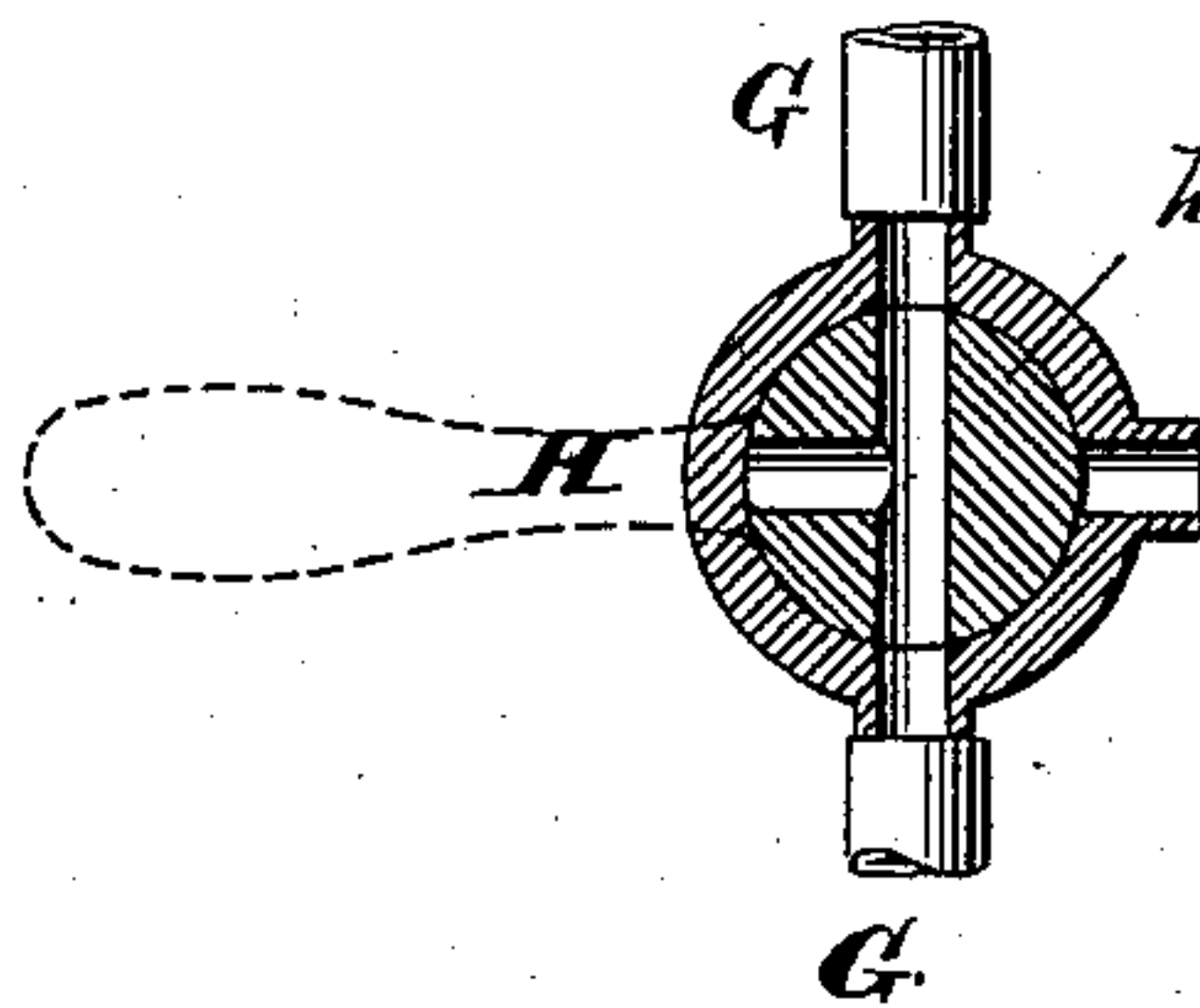
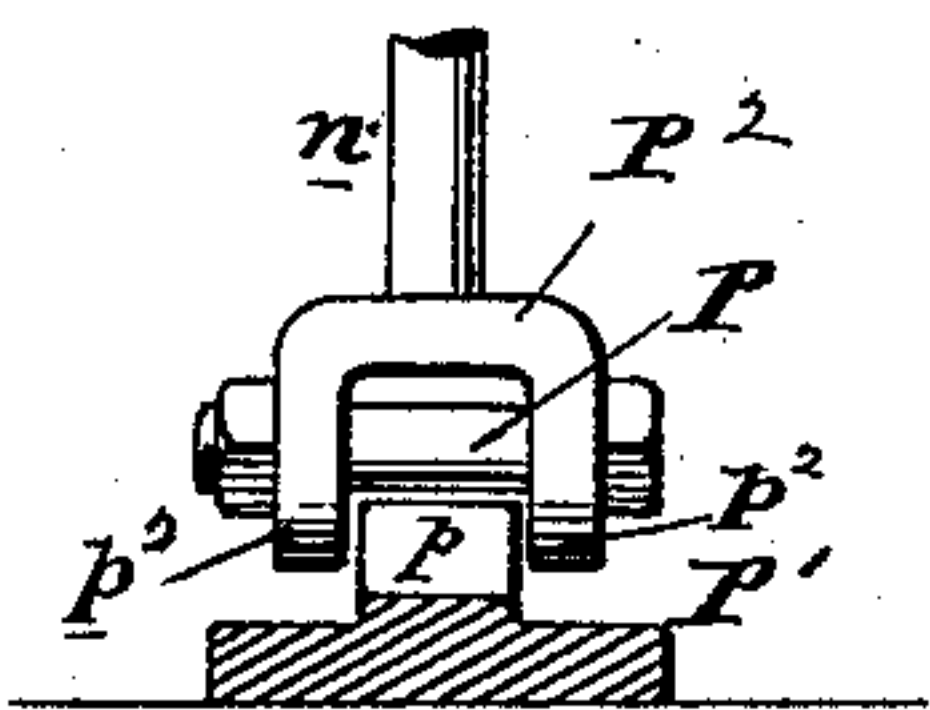
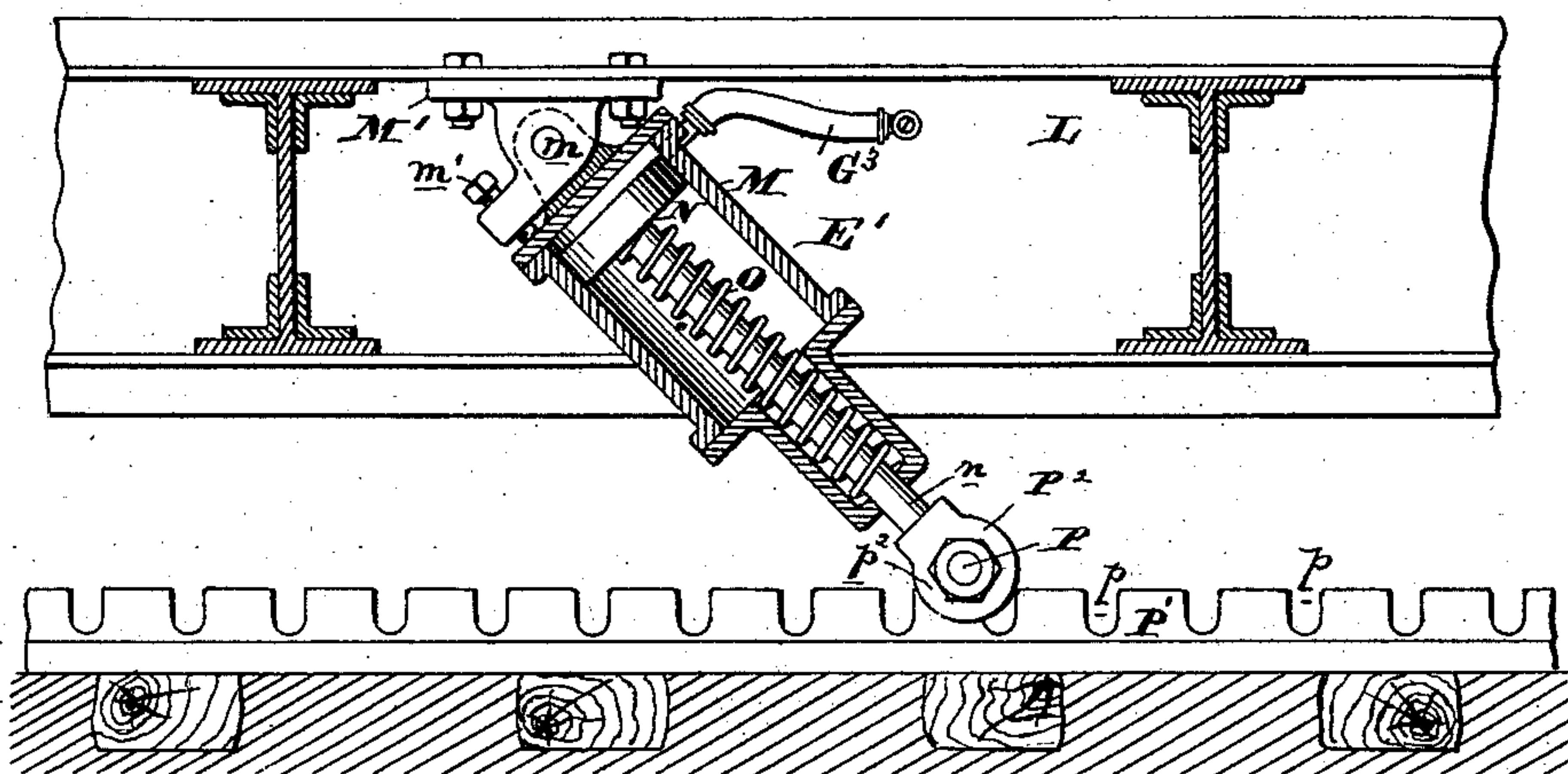


FIG. 7

FIG. 5



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TURN TABLE.

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FIG. 8

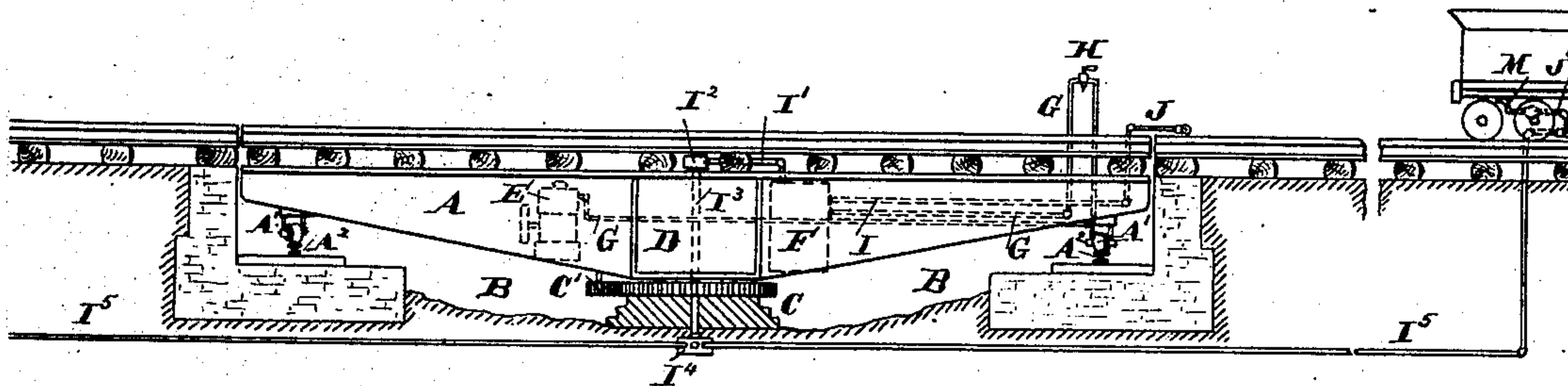
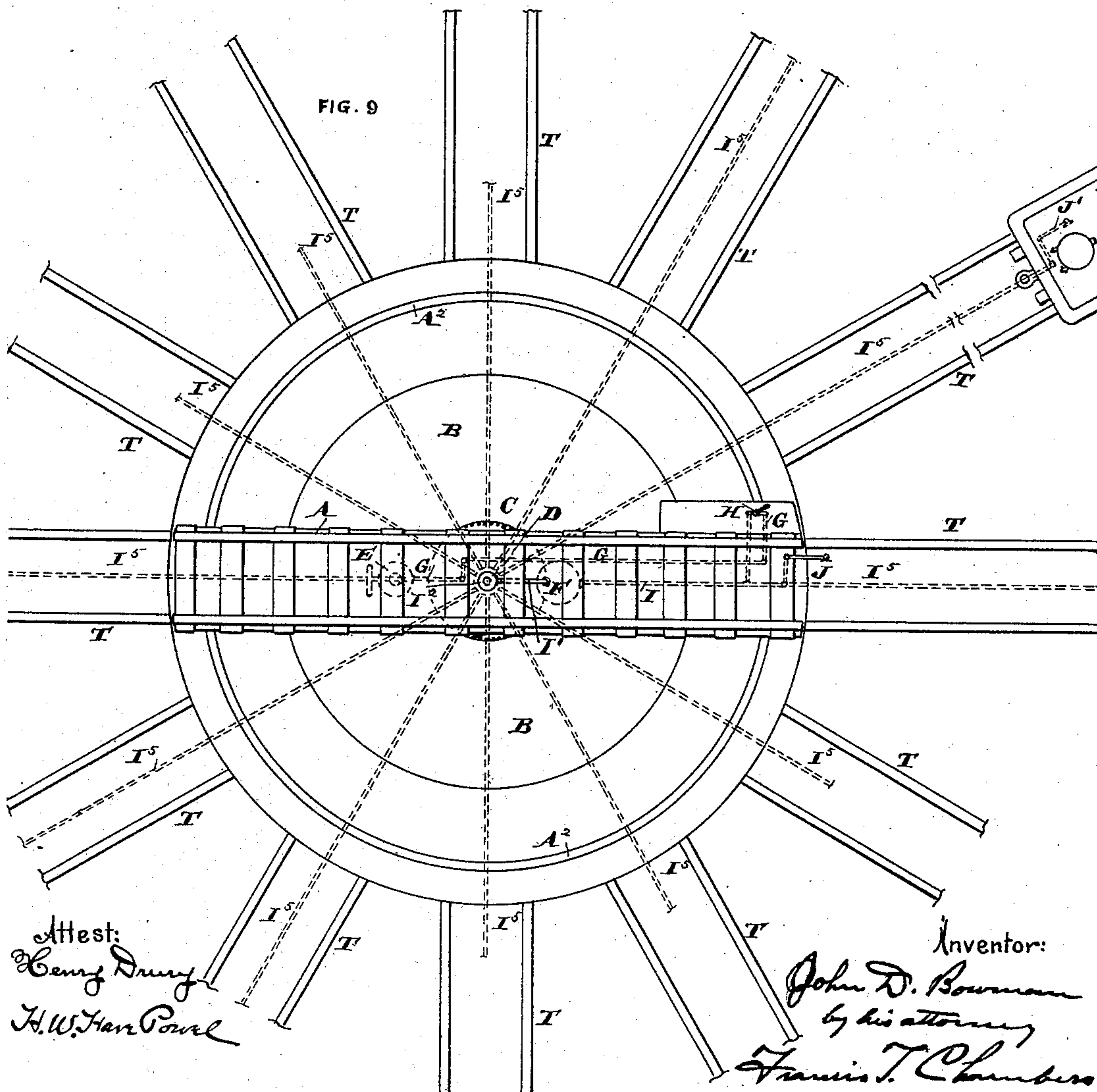


FIG. 9



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UNITED STATES PATENT OFFICE.

JOHN D. BOWMAN, OF ALTOONA, PENNSYLVANIA.

TURN-TABLE.

SPECIFICATION forming part of Letters Patent No. 389,541, dated September 18, 1888.

Application filed April 26, 1888. Serial No. 271,956. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. BOWMAN, of Altoona, county of Blair, State of Pennsylvania, have invented a new and useful Improvement in Turn-Tables, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to the construction of railway turn-tables, and has for its object to provide means whereby such turn-tables may be operated by power in a way at once simple, cheap, and under perfect control; and it consists of the devices hereinafter particularly described, and particularly pointed out in the claims.

Reference being now had to the drawings, which illustrate my invention, Figure 1 is a side elevation of a turn-table embodying my invention, showing a locomotive in place on said table and with its air-brake system coupled to the supply-pipe of the actuating-engine. Fig. 2 is also a side elevation of a turn-table embodying my invention with parts cut away, so as to show the actuating-engine, an air-storage tank, and a system of conduits, valves, &c., whereby the engine is supplied with air and actuated by the operator. Fig. 3 is a plan view of the same. Fig. 4 is a diagram showing another form of engine for actuating the table and the system of pipes, valves, &c., which I contemplate using with this form of engine, which I may here say is the one I prefer using. Fig. 5 is an end view of the table shown in Fig. 4, and is taken on sectional lines adapted to show the construction of the engine and its mode of attachment to the table and of actuating the same. Fig. 6 is a view of the device or head on the end of the piston-rod of the engine shown in Fig. 5 and of the rack with which said head is adapted to engage. Fig. 7 is a sectional view of the controlling operating-cock; and Figs. 8 and 9 are respectively an elevation and a plan showing how compressed air or steam can be supplied to the engine from engines in the yard, but not actually on the table.

A in all the figures represents the turn-table, which may be of any ordinary construction.

A' are the trailing wheels, and A² the circular track on which said wheels run.

B is the pit in which the table is placed.

D is the central pivot on which the table turns.

C in Figs. 1, 2, and 3 is a circular toothed rack secured to and surrounding the stationary foundation on which the pivot D rests.

C' is a gear-wheel engaging the rack C and secured on a shaft, *c*, having its bearings rigidly secured to the table A.

E is the engine, which may be of any ordinary type, and, as shown, is firmly secured to the table A. This engine has its main shaft secured in bearings formed in the same supporting structure as the bearings of the shaft *c*, and upon it are placed two miter-wheels, *e e*, engaging the teeth of a miter-wheel, *c'*, on opposite sides thereof, said wheel *c'* being secured on the end of the shaft *c*. A clutch-lever, K, is arranged so as to engage either of the wheels *e e* with the shaft on which they are journaled, and the shaft *c* is of course rotated in different directions, according to which wheel *e* is engaged with the shaft.

I designates a pipe one end of which has a hose, J, secured to it and so placed as to be in position to couple with the air-brake hose of the engine or tender on the table. As shown, this pipe I runs to a reservoir-tank, F, where a supply of compressed air can be stored, a valve, preferably automatic, being inserted in the end of the pipe I or hose J to prevent the air from escaping by the way it enters. Such valves would be, for instance, at *i* or *j*, or in both places.

G is a pipe which, as shown, connects at one end with the pipe I and at a point where the communication with the reservoir F is uninterrupted (or it might come directly out of reservoir F, as indicated in Fig. 8) at one end of the table. This pipe comes above the level of the road-bed, forming a loop, the top of which will be within easy reach of the operator. At this point a three-way cock, H, is placed, (see Fig. 7,) said cock having an opening, H', to the air, so that by turning the plug *h* either branch of pipe G may be thrown open, or they may be connected together, as in Fig. 7. The pipe G is continued past its loop to the valve-chamber of the engine E.

The operation of the above-described device is as follows: The engine being in place on the table, the hose J is coupled to the air-hose of the engine or tender and the compressed air

allowed to escape from the reservoir on the engine through pipe I into the reservoir F of the table. When a sufficient supply has been accumulated in the reservoir, the operator moves the cock H (which has been theretofore placed so as to close the conduit G) so as to connect the two branches of G. The air will then escape into the cylinder of engine E through an ordinary valve-chamber, and the engine, being set in motion, will rotate the shaft on which the cog-gears c have their bearings. The operator engages either of these wheels with said shaft by means of the clutch-lever K, which is actuated through rod k and lever K', the last lever being placed close to valve H, so that both can be reached from the same spot. In this way the engine is made to revolve the shaft c in either direction, and this shaft, by means of its gear-wheels C' engaging with rack C, causes the table A to revolve on its pivot. When the table is moved to its desired position, the operator closes the cock H, stopping the flow of air to the engine. Indeed, by alternately opening and shutting the cock H a valve-chamber can be dispensed with, the return-stroke of the engine-piston being brought about by a spring, as in the other form of engine shown in the drawings, Figs. 4 and 5.

The reservoir F is a valuable addition to my device, as air can be stored in it in quantity sufficient to operate the engine on the table for a considerable time without drawing more air from engines being handled. It may, however, be dispensed with and the air conveyed directly from the locomotive to the table-engine, and of course this would be necessary in cases where steam was used instead of air to actuate the table.

J', Fig. 1, indicates a prolongation of the hose J, adapted to make connection with the boiler of the locomotive where steam is used to actuate the engine of the table.

In Figs. 4, 5, and 6 I have illustrated a special form of actuating engine or engines which, by reason of their simplicity and cheapness, I prefer to use. As shown in these drawings, I secure at both ends of the tables cylindrical engines E' E², which at their upper ends are pivoted to the table, preferably as shown, between the cross-girders L, which sustain the trailing wheels. These engines consist (see Fig. 5) of a cylinder, M, pivoted at its top on a bearing, m . A supporting-casting, M', secured between the girders L, should be employed to sustain this bearing, and an adjustable stop, m' , is advisable to prevent the cylinder from swinging down below a certain angle. In the cylinder M is a piston, N, which should of course fit neatly, and a piston-rod, n , attached to the piston, passes out of the lower end of the cylinder.

O is a spring placed between the under side of piston N and the lower end of the cylinder, and adjusted so as to force the piston to the top of the cylinder, as shown in Fig. 5. At the end of piston-rod n is formed or secured a cross-head, P², with arms p^2 distant

from each other by a slightly greater distance than the breadth of the rack P', hereinafter described, said arms being arranged so as to project below a cross-bar, P, which extends between and is supported by them.

P' is a toothed rack of circular form extending around the bottom of the pit B, and so placed as to come directly beneath the end of rod n .

p represents the recesses beneath the teeth of said rack.

G² indicates a flexible pipe or hose, by which the conduit for air or steam is connected with the cylinder M. Where, as in Fig. 4, two engines, E' E², are used, the conduit G is branched into two pipes, G' G², stop-cocks R' R² being placed in the said pipes at points near and within reach of the cock H.

In adjusting the apparatus for use the stop m' should be so arranged that the lowest position of the cylinder M will, when the piston is in its uppermost position, enable the cross-bar P on the end of the piston-rod n to clear the tops of the teeth in rack P' while the arms p^2 of the cross-head P² still extend down the edges of the rack. The engines E' E² on the opposite sides of the table are arranged to point and operate in opposite directions with respect to the circular rack, as shown in Fig. 4. The operator, wishing to turn the table, then opens one of the cocks, R' or R², thus connecting either of the engines, E' or E², with the conduit G, according to the direction in which he wishes to turn the table. Then by turning the cock H he opens the conduit G and the air will pass from the reservoir F to the connected engine, (say E',) the piston N of which will be forced down. The bar P will enter one of the spaces p , and, being held there, the continued movement of the piston will result in turning the table in the opposite direction. When the downward movement of piston N is complete or sufficient, the operator turns cock H so as to close the conduit leading from the point of supply and open the conduit leading to the engine into the open air. The steam or air in the cylinder will then of course escape, and the spring O will force the piston to the top of the cylinder and lift the bar P above the level of rack P'. Any number of strokes may be made in this way by repeating the before-described movements of cock H, and the table thus turned to any desired position. To reverse the motion of the table, the cock R' should be closed and cock R² opened. The same manipulations of cock H will then actuate the engine E², which, operating in the same way as E', will turn the table in the reverse direction.

Of course a single pivoted engine, such as is shown in Fig. 5, can be used instead of two.

It will sometimes be advantageous to supply compressed air or steam to actuate the table from a distance—as, for instance, where a locomotive or car to be turned has not the necessary appliances for connecting with the hose on the table. I provide for such cases in

the way indicated in Figs. 8 and 9, in which I is a pipe leading from the reservoir-tank F to the center of the table, where by means of a universal joint, I², it connects with a vertical pipe, I³, said vertical pipe leading down through the center of the pivotal support of the table and having at its lower end any desired number of branches I⁵ I⁵, &c., which run outward beyond the limits of the pit B and are brought to the surface and provided with coupling-hose J' at any convenient point. As shown in said figures of the drawings, these pipes I run outward along the different tracks, centering in the turn-table, so as to connect with a locomotive on any of said tracks.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a turn-table and an engine arranged to rotate said table, a conduit leading from said engine to a storage-tank, a conduit leading from the storage-tank, and a coupling-hose secured on the end of said last-mentioned conduit, substantially as specified, and so that the engine and table can be connected with and operated by a locomotive on or near the said table.

2. The combination, with a turn-table, of an engine supported on the table and arranged to turn the same when in motion, a conduit leading from the engine-cylinder to a point on or near the table, a coupling-hose secured on the end of said conduit, and a valve situated in the conduit, whereby the admission of air or steam to the engine-cylinder can be controlled.

3. The combination, with a turn-table, of an engine supported on the table and arranged to turn the same when in motion, a storage tank secured on the table, a conduit leading from the engine-cylinder to the said storage-tank, a conduit leading from the storage-tank to a point on or near the table, a coupling-hose secured on the end of said conduit, whereby it can be connected with the air-brake system of an engine, and a valve situated in the conduit connecting the tank and engine, whereby the air can be admitted at will to said engine.

4. The combination, with a turn-table, of an engine supported on the table and arranged to turn the same when in motion, a storage-tank secured on the table, a conduit leading from the engine-cylinder to the said storage-tank, a conduit leading from the storage tank to a point on or near the table, a coupling-hose secured on the end of said conduit, whereby it can be connected with the air-brake system of an engine, and a three-way valve, H, situated in the conduit connecting the storage-tank and engine, whereby the air can, at will, be admitted to or permitted to escape from the engine-cylinder.

5. The combination, with a turn table, of an engine supported thereon and arranged to turn the table when in operation, a storage-tank, a conduit connecting the storage-tank and engine-cylinder and having a loop formed in it so as to project above the surface of the table,

a three-way cock situated in said loop above the surface of the table and arranged to open or close the conduit or to connect the engine-cylinder with the open air, a conduit leading from the storage-tank to a point on the end of the table at which the three-way cock is situated, and a coupling-hose secured on the end of said conduit, and whereby connection can be made between the tank and the air-brake system of a locomotive on the table.

6. The combination, with a turn-table, of an engine supported thereon and arranged to turn the table when in operation, a storage-tank, a conduit connecting the storage-tank and engine-cylinder and having a loop formed in it so as to project above the surface of the table, a three-way cock situated in said loop above the surface of the table and arranged to open or close the conduit or to connect the engine-cylinder with the open air, a conduit leading from the storage-tank to a point on the end of the table at which the three-way cock is situated, a coupling-hose secured on the end of said conduit, and whereby connection can be made between the tank and the air-brake system of a locomotive on the table, a conduit leading from the storage-tank to a pipe or conduit passing through the center of the table-pivot, and one or more pipes or conduits connecting with said last-mentioned conduit and leading from it to a point or points near the turn-table.

7. In combination with a turn-table, a stationary circular rack secured around said table, a pivoted engine-cylinder, M, secured to one end of said table and having an opening near its upper end, a piston and rod working in said cylinder, a spring arranged beneath the piston to force it upward in the cylinder, a head on the end of the piston-rod arranged to engage the rack when the piston is forced down, a conduit connected with the opening in cylinder M, a coupling-hose connected directly or indirectly with said conduit, and a valve situated in said conduit, whereby the engine-cylinder can be operated, as specified.

8. In combination with a turn-table, a stationary circular rack secured around said table, a pivoted engine-cylinder, M, secured to one end of said table and having an opening near its upper end, a stop arranged to prevent the cylinder from falling below a determined oblique position, a piston and rod working in said cylinder, a spring arranged beneath the piston to force it upward in the cylinder, a head on the end of the piston-rod arranged to engage the rack when the piston is forced down, a conduit connected with the opening in cylinder M, a coupling-hose connected directly or indirectly with said conduit, and a valve situated in said conduit, whereby the engine-cylinder can be operated, as specified.

9. In combination with a turn-table, a stationary circular rack secured around said table, a pivoted engine cylinder, M, secured to one end of said table and having an opening near its upper end, a stop arranged to prevent

the cylinder from falling below a determined oblique position, a piston and rod working in said cylinder, a spring arranged beneath the piston to force it upward in the cylinder, a head on the end of the piston-rod arranged to engage the rack when the piston is forced down, an air-reservoir secured upon the table, a conduit connecting the air-reservoir and engine-cylinder, a three-way valve situated in said conduit, and a conduit leading to the air-reservoir and having an air-coupling hose at its free end, all substantially as and for the purpose described.

10. In combination with a turn-table, a rack, P', secured around the pit thereof, engine-cylinders M M, pivoted at each end of said table, pistons and rods N O, fitting in said cylinders and having heads P², adapted to engage the rack, springs to hold the piston and its connections normally in their uppermost position, conduits G' G², leading from the cylinders to a conduit, G, valves R' R², for closing or opening said conduits at will, a conduit, G,

leading from a union of conduits, G' G², and having directly or indirectly connected with it a coupling-hose, and a three-way valve, H, situated in said last-mentioned conduit. 25

11. In combination with a turn-table, a rack, P', secured around the pit thereof, engine-cylinders M M, pivoted at each end of said table, piston and rods N O, fitting in said cylinders and having heads P², adapted to engage the rack, springs to hold the piston and its connections normally in their uppermost position, conduits G' G², leading from the cylinders to a conduit, G, valves R' R², for closing or opening said conduits at will, a conduit, G, leading from a union of conduits, G' G², to a storage-tank, said storage-tank, and a conduit leading thereto and having a coupling-hose secured to its free end. 30 35 40

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Witnesses:

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