(No Model.) 4 Sheets—Sheet 1.

E. CHAQUETTE.

POWER MOTOR.

No. 542,359. Patented July 9, 1895.

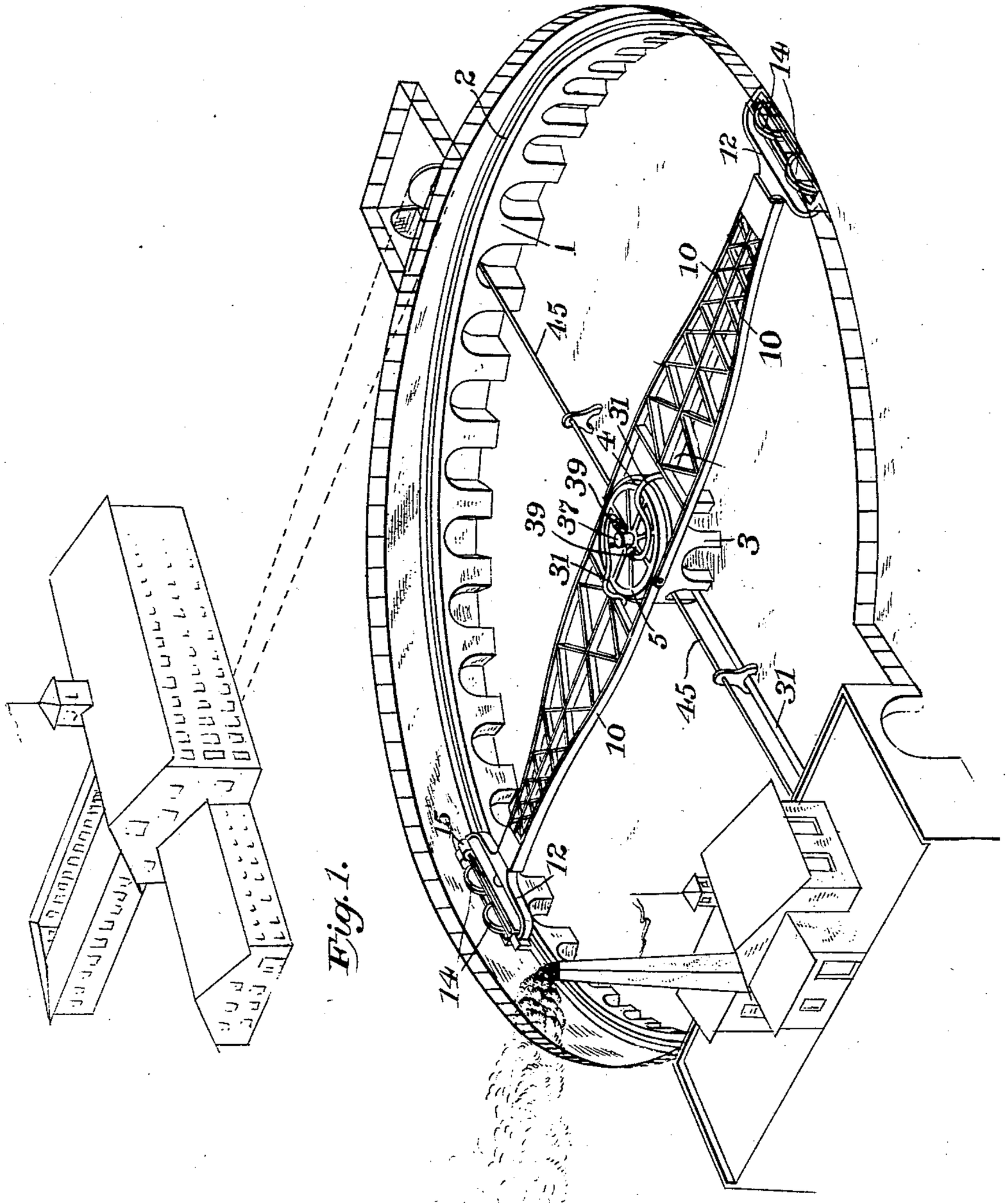

Fig. 1.

WITNESSES:

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M. S. Longden.

INVENTOR

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BY

J. M. Smith & Co.

ATTORNEY

(No Model.)

4 Sheets—Sheet 2.

E. CHAQUETTE.

POWER MOTOR.

No. 542,359. Patented July 9, 1895.

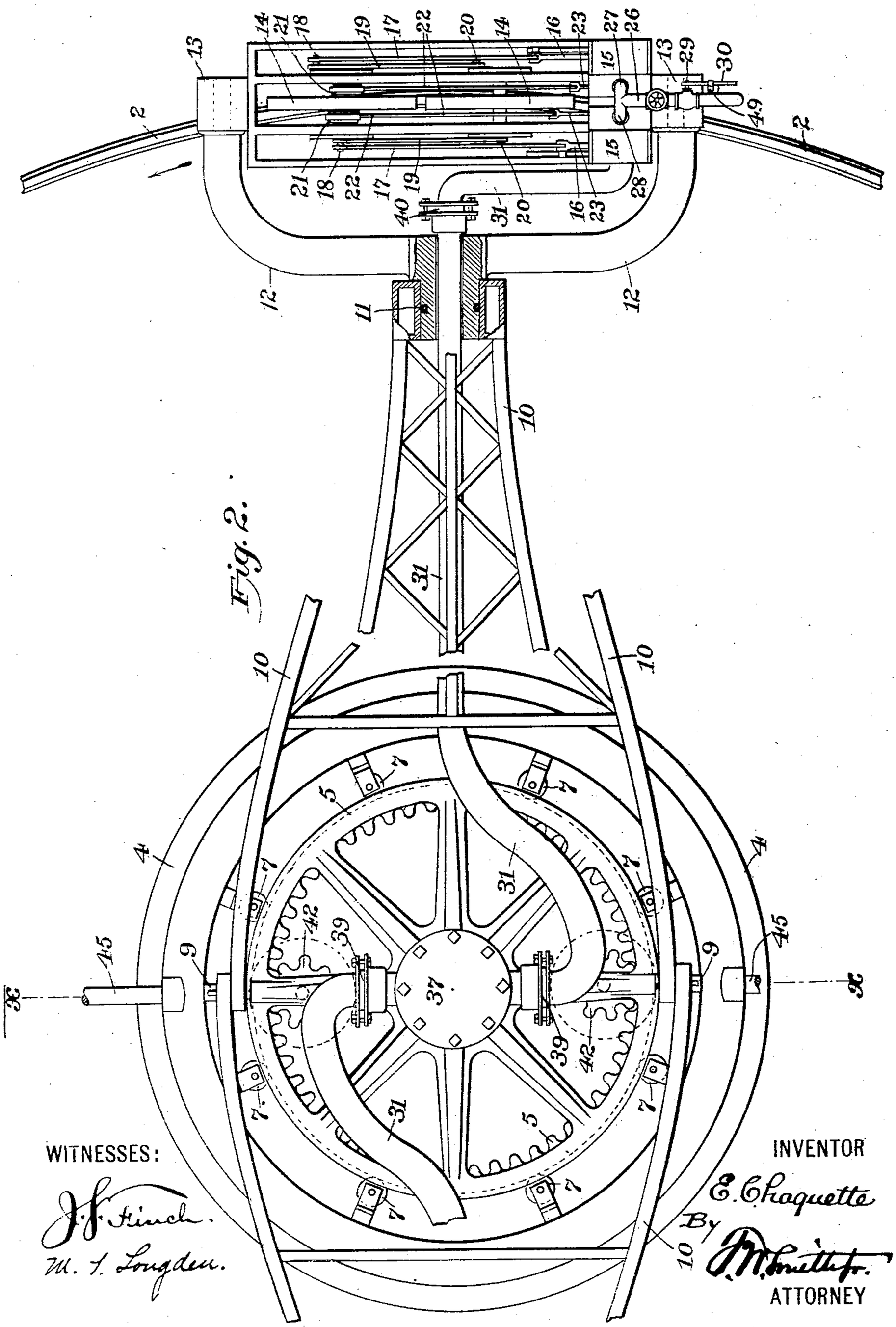

Fig. 2.

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(No Model.)

4 Sheets—Sheet 3.

E. CHAQUETTE.

POWER MOTOR.

No. 542,359. Patented July 9, 1895.

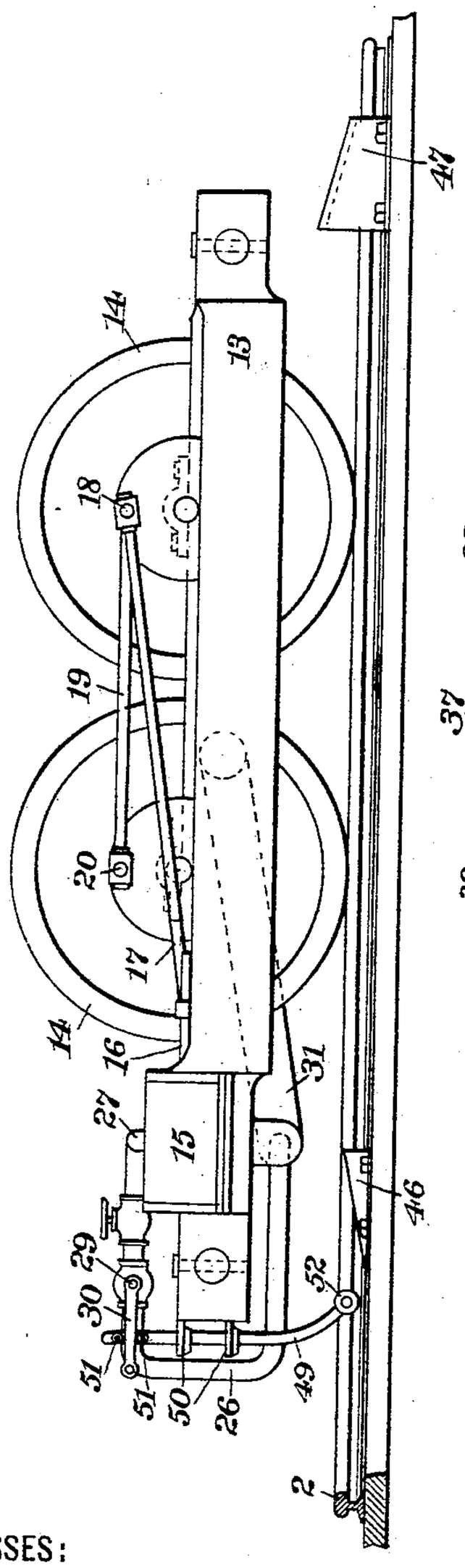

Fig. 3.

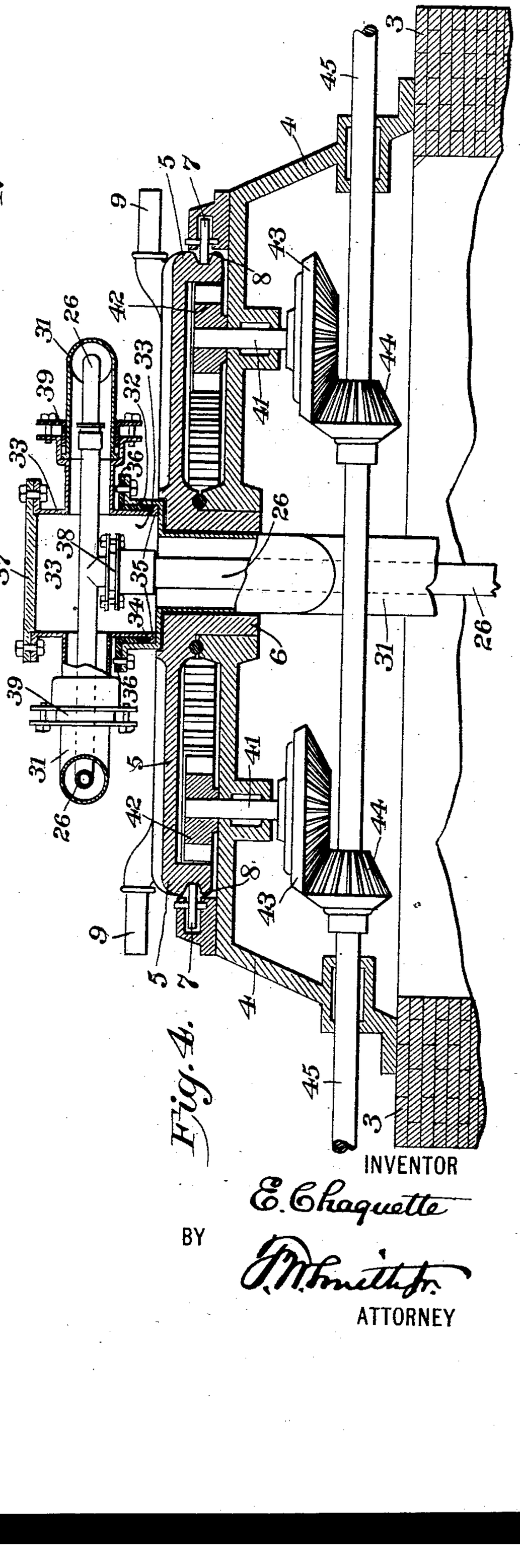

Fig. 4.

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(No Model.)

4 Sheets—Sheet 4.

E. CHAQUETTE.

POWER MOTOR.

No. 542,359. Patented July 9, 1895.

Fig. 6.

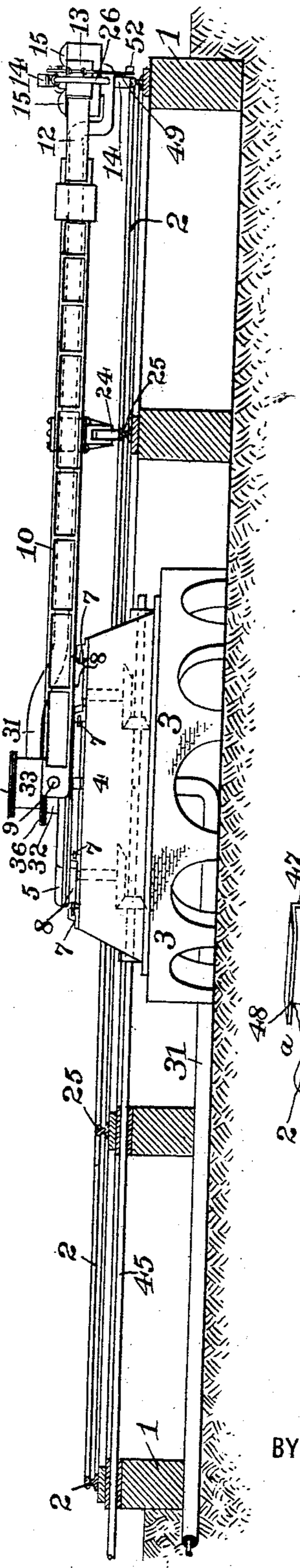

Fig. 5.

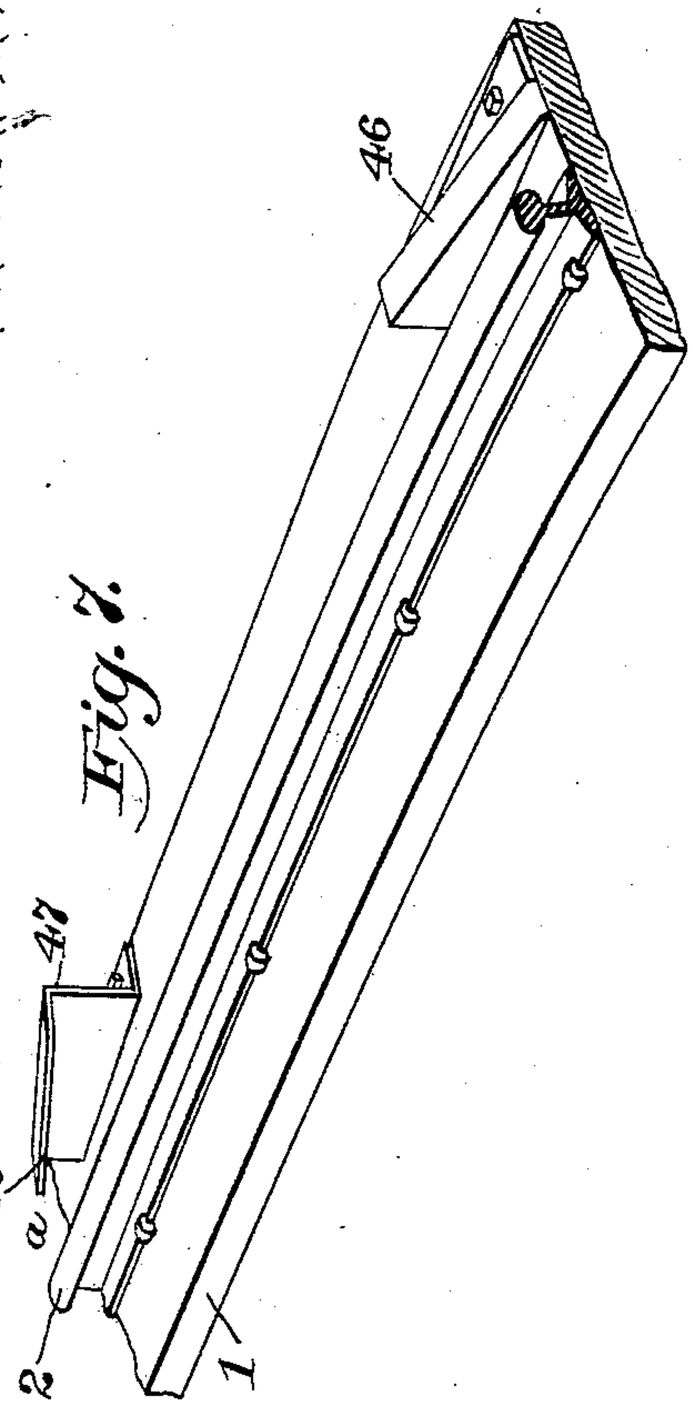

Fig. 7.

WITNESSES:

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UNITED STATES PATENT OFFICE.

EPHRAIEM CHAQUETTE, OF BRIDGEPORT, CONNECTICUT.

POWER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 542,359, dated July 9, 1895.

Application filed July 16, 1894. Serial No. 517,707. (No model.)

To all whom it may concern:

Be it known that I, EPHRAIEM CHAQUETTE, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Power-Motors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in producing and supplying power for driving machinery and doing other work. Its object is to produce and supply motive power on a scale of considerable magnitude and under conditions of great economy from a central station to various points or localities within a limited circuit for driving machinery and doing other work at a considerable reduction in the cost of producing a given amount of power.

The following description fully explains the manner in which I proceed to carry out my invention and produce a motor or motive power in accordance therewith, the accompanying drawings being referred to by figures and letters, and corresponding parts in all the views indicated by similar reference characters.

Figure 1 is a perspective view of an improved motive power embodying the points and features of my invention. Fig. 2 is a detail broken plan showing the lever and the locomotive at the end thereof, the connections being shown between the lever and power-transmitting gear; Fig. 3, a detail side elevation of the locomotive, and showing also the devices for automatically opening and closing the throttle; Fig. 4, a central vertical section at the line $x\,x$ of Fig. 2; Fig. 5, a sectional elevation of my improved power system, illustrating a single locomotive at the end of a radial lever, the track being shown as level, while an additional circular track is provided on which travels a wheel supported in a truck about midway of said lever in order to afford additional support to the latter. Fig. 6 shows in elevation a diagram of the circular track on which the locomotive travels, and Fig. 7 is a perspective of a short section of the track with the devices for automatically opening and closing the throttle in proper position relative to said track.

Similar numbers of reference denote like parts in the several figures of the drawings.

1 is a stationary bed of masonry, and 2 is a circular track formed by rails secured upon said bed. At the center of this circular way is a pier 3, upon which is mounted a stanchion-plate 4.

5 is a large power-transmitting gear, the teeth whereof are on the inside, said gear being provided with a hollow hub 6, which is journaled in any suitable manner within the stanchion-plate, so that said gear is capable of a horizontal revolution. Journaled within suitable bearings at the outside of the stanchion-plate are horizontally-disposed disks 7, which track within an annular groove 8 in the periphery of said gear, whereby the latter is rendered steady during revolution.

Pivoted to trunnions 9, which extend laterally from the gear 5, is a long beam or lever 10 equal in length to the radius of the circular track 2. Swiveled at 11 within the outer end of this lever is a yoke 12, whose extremities are secured within opposite sides of the frame 13 of the locomotive. The object of this swivel is to relieve the lever from all unnecessary vibration from said frame, and furthermore to enable the locomotive to ascend and descend grades without any torsion on said lever.

The lever 10 is substantially a crank extended from the gear 5, and I prefer to use two of these levers, each swiveled around the trunnions 9 and provided at their extremities with locomotives, as hereinbefore described, such levers being in alignment, for the reason that I have ascertained that this arrangement (shown in Figs. 1 and 2) gives a steadier and more uniform movement to the power-gear. Of course a single lever will answer the purposes of my invention, as will be readily understood by reference to Fig. 5, and I do not therefore wish to be confined to any specified number of such levers.

The frame 13 is of sufficient weight to insure suitable traction, and its momentum when under way assists the locomotive and contributes to the smoothness and regularity of movement around the circular track.

The locomotive is of ordinary construction

and requires no detailed description, and I will merely specify that it has a set of driving-wheels 14 and a pair of steam-cylinders 15, whose pistons 16 are connected, by rods 17, to crank-pins 18 of the front driving-wheel, and these two crank-pins on each side are coupled by rods 19 to the crank-pins 20 of the rear driving-wheel.

21 are eccentrics on the axle of the forward driving-wheel, which are connected up in the usual manner, by rods 22, to valve-stems 23, whereby valves inside the cylinders 15 may be operated in the usual manner to control the supply and exhaust of steam. I have not deemed it necessary to show or describe these valves, since they are of ordinary construction and operation and form no part of my present invention.

In its general construction the locomotive is therefore similar to the driving portion of an ordinary railway-locomotive, excepting that in the present instance the driving-wheels are in line to run on a single rail and no truck-wheels are ordinarily used, and said wheels are similar to those in an ordinary locomotive of the heavier class, excepting that there are no flanges, but only a flat rim or tread much broader than the face of the rail. The lever 10, besides affording sufficient support to the frame 13 to keep the locomotive in upright position on the rails, also resists the lateral or radial movement of the locomotive due to the centrifugal force and thus keeps the driving-wheels on the rails without the use of flanges, so that the friction and resistance incident to the use of flanges may be avoided. Where the length of the lever requires additional support at a point or points between the extremities and the center of rotation, I place small truck-wheels 24 beneath said lever and provide an additional circular track 25 on which said wheels may run, as clearly shown at Fig. 5.

I will now describe the means whereby steam is supplied to the cylinders 15, as well as the means whereby the exhaust-steam is carried off.

The steam is taken from any stationary boiler (not shown) by means of the steam-pipe 26, which is brought up through the hollow hub 6 and thence led directly to the cylinders. This steam-pipe has two branches 27 28, which lead to the respective cylinders, and said pipe is provided with an ordinary throttle-valve to the stem 29, whereof is secured a lever 30, for the purpose presently explained.

The valves which control the supply of steam within the cylinders from the pipe 26 are alternately opened and closed by reason of the action of the eccentrics 21, as hereinbefore set forth, so that it will readily be understood that the steam will be introduced within said cylinders alternately.

The exhaust-pipe 31 leads from the bottoms of the cylinders precisely in the same manner as the steam-supply pipe leads into the tops of said cylinders and said exhaust-pipe surrounds the steam-pipe 26 and leads backward, supported by the lever 10, and thence down through the hollow hub 6 to any suitable point. By inclosing the steam-pipe with the exhaust-pipe the former is prevented from cooling, thereby preventing too great a loss from condensation of live steam, while at the same time the mode of leading the steam-pipes is both compact and convenient.

This system of steam supply and exhaust pipes, as well as the connections between the same and the cylinders, is old and well known, and it is not deemed necessary to enter into any detailed description thereof, since the same forms no part of my invention. It becomes necessary, however, to provide swivel-joints both in the steam-supply and exhaust pipes, whereby the same will not become distorted by the rotary movement of the lever 10 or by the traveling of the locomotive in ascending or descending grades. I will therefore describe the manner in which said pipes are arranged and jointed, so that there can be no distortion of the same.

The exhaust-pipe 31, immediately above the power-gear 5, is formed into an enlarged head 32, within which is a box 33, capable of turning freely. Between this box and head steam-packing 34 is placed and rests against a flange 35, which extends outwardly around the bottom of the box, and a gland 36, bolted to the head 32, serves to keep the parts and packing in position without interfering with the rotary movement of said box. The top of the box is provided with a cover 37, bolted thereto for the purpose of obtaining access to the steam-pipe at that location. The steam-supply pipe 26 also has a joint at 38 precisely like the joint above described with reference to the exhaust-pipe, so that it will be readily understood that both the steam supply and exhaust pipes which lead throughout the lever 10 may be carried by the latter in its rotary movement.

The exhaust-pipe, with the steam-pipe inclosed therein, extends laterally from the box 33 throughout the lever 10 to the steam-cylinders, but it is necessary that both of these pipes should follow without torsion the movements of the lever 10 in a vertical plane when the locomotive is ascending or descending grades. In order to bring about this result the pipes are extended from the box 33 in a plane at right angles to the length of the lever 10, and are provided with swivel-joints 39, (the reference-numeral referring only to the exhaust-pipe, the joint in the steam-pipe being identical therewith, only not shown,) the pipes being then bent around from the joint into line with the lever. The yoke 12 is swiveled to the extremity of the lever in order to relieve the latter from torsion when the locomotive is ascending or descending grades, and in order that the steam supply and exhaust pipes may not become distorted at such times I provide swivel-joints therein at a point im-

mediately beyond the yoke 12, such swiveled joints being shown at 40 only in the instance of the exhaust-pipe, the interior steam-pipe being provided with a similar joint (not shown) at this point.

It will thus be readily understood that the locomotive, lever, steam supply and exhaust pipes, and power-gear may all be carried around in the arc of a circle from a common center of rotation, and that the locomotive may ascend and descend grades without in the slightest degree distorting or straining any of the parts.

Extending vertically through the stanchion 4, at opposite sides thereof, are shafts 41, on whose upper extremities are secured pinions 42, which engage with the teeth on the inside of the power-gear 5, while on the lower extremities of such shafts are secured bevel-gears 43, which mesh with bevel-gears 44, which latter are secured upon a long shaft 45, which latter is the main or power shaft from which the power effected by my improvement is taken. The power may be taken from this shaft 45 by any suitable means, such as counter-shafts, belts of endless wire ropes, sprocket-wheels and chains, as shown at Fig. 1, where such belt, ropes, or chains appear in dotted lines leading to a shop or other building.

My improved motor thus provides a central station, from which power may be supplied to shops, buildings, or machinery within practical distance.

It will be readily understood that the force or power accumulated in running the locomotive around the track is greatly multiplied by the lever 10, which is of considerable length, and that this leverage is in turn further increased at the power-shaft by gearing.

With a stationary boiler two locomotives at the ends of two levers may be as readily supplied with steam and with the same labor or attention as in the instance of a single locomotive, while the advantage in either case of feeding the boiler, handling fuel, and managing the fires will clearly be superior to any construction wherein the boiler is mounted to travel with or upon the locomotive.

In some cases I provide for running the locomotive with steam cut off at one or more points in the circular track, in order that the momentum of the locomotive may be utilized for the purpose of driving the same around the track. In such an instance the track is laid with a long and gradually-descending portion (shown from *a* to *b* at Fig. 6) and with a short and abruptly-rising portion. (Shown from *b* to *a*.) The steam is applied to run the locomotive up the steep grade, but is shut off as the locomotive reaches the top and begins to make the descent. The remainder of the circular track being down grade the locomotive is propelled by force of gravity and the momentum acquired.

In connection with a track, as above set forth, I would, of course, employ two levers with locomotives on the ends thereof, such levers being in alignment, so that the locomotives would be diametrically opposite each other. One locomotive would, therefore, be on the down grade when the other was ascending the steep portion of the track, and as such portion extends through but a small portion of the whole circular track the two locomotives would also be both on the down grade at the same time as soon as one has made the ascent. The forces of inertia and gravitation are therefore utilized to advantage at points in the movement of the locomotive around the circle to replace the steam-power.

The means which I employ to automatically cut off and supply steam to the cylinders is very simple. To the bed 1, near the side of the rail and beyond the same, is secured an inclined block 46, the location whereof is at or near the point denoted by *b* in Fig. 6, while near the point *a* at the top of the grade a flange-plate 47 is secured to said bed outside of the rail, said plate having a flange 48, which projects inwardly toward the rail in a plane gradually declining toward the point *a*.

49 is a bar supported within ears 50, which extend from the frame 13, the upper end of said bar having laterally-extending lugs 51, which embrace the throttle-valve lever 30 on opposite sides thereof, so that it will be readily understood that any vertical movement of this bar 49 will cause said valve to be turned to open or close the steam-inlet, as the case may be. The lower extremity of this bar 49 is provided with a friction-roll 52, which latter during the circuit of the locomotive around the track will ride up the block 46, thereby opening the throttle to admit steam into the cylinders. When this roll 52 comes in contact with the overhanging inclined flange 48, the throttle will be closed, thereby cutting off the steam and allowing the locomotive to descend the grade from *a* to *b* by its gravity and momentum alone.

The vertical movement of the bar 49 may of course be regulated, so that the throttle may thereby be closed altogether or only partly closed, and the block 46 and plate 47 may be located at any desired points along the circular track. Moreover, in the instance of a level track, this block and plate may be utilized and so arranged that they may be thrown into and out of operative position, as may be desired, either for the purpose of reducing the speed of the locomotive or for entirely stopping the latter without requiring that an attendant shall mount the locomotive to turn the throttle-valve. It will be seen that in the instance of a track having ascending and descending grades the swivel-joints heretofore described are indispensable, but it will also be clear that in the instance of a level track all the joints in these pipes, with the exception of those at the points 32 and 38, may be dispensed with.

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

1. In a motor a rotatory power transmitting gear, an engine adapted to move around a circular way or track, having a plurality of driving wheels set in line to run on a single rail or bearing surface, and a beam or lever attached to the engine and to said gear at the center of the circular way for supporting the engine and confining it to its circular path, substantially as set forth.

2. In a motor, an engine adapted to travel in a circle, and a stationary boiler, in combination with a power transmitting gear at the center of said circle, a connecting steam pipe composed of stationary and movable sections, the latter extending from the stationary pipe at the center, out to the engine, at the circumference, and a moving beam or lever extending from said gear at the center to the engine at the circumference of the circle, and adapted to carry said movable section, substantially as set forth.

3. In a motor, the combination of a centrally pivoted lever having a traveling engine mounted on each end, a circular way or track having ascending and descending grades, a power transmitting gear journaled at the center of said way and to which said lever is connected and a steam cut-off mechanism applied and arranged to cut off the steam power at one or more points in the circle during the movement of the engine, substantially as set forth.

4. In a motor, a traveling engine, a circular way on which said engine travels, a valve moving with the engine, and projections on the circle with which the valve connections engage, whereby the valve movement is controlled by the engine movement, all combined substantially as described.

5. In a motor, the combination of a centrally pivoted lever having a traveling engine mounted on each end thereof, and means for supplying steam to the engine from a fixed point a circular track or way having a short ascending and a long descending grade, and a throttle valve and means substantially as described whereby steam is cut off at the descending portion, and turned on at the ascending portion of the track.

6. In a motor, the combination of a circular track or way, a stationary boiler, a power transmitting gear at the center of said way, a lever connected to said gear, and steam supply and exhaust pipes having joints in their lengths at the center of movement of suitable character to permit the pipes to follow the movement of the lever in a horizontal direction around the circle, substantially as set forth.

7. In a motor, the combination of a stationary boiler, and a traveling engine having connection by means of steam pipes with yielding joints or couplings that permit the engine to travel in a continuous circle and in ascending and descending inclines or grades thereof, substantially as set forth.

8. A motor having a traveling engine adapted to move in a circle, a circular way or track consisting of a single rail or narrow bearing surface, a lever to the outer end whereof said engine is secured, a power transmitting gear with which the lever is connected at the center of the circle, and a power shaft geared into said power transmitting gear, substantially as described.

9. In a motor for producing and supplying power for driving machinery and the like, the combination of a rotatory power transmitting gear, the main power shaft, operative connections between said shaft and gear whereby motion is communicated from the former to the latter, a circular track concentric with said gear, a locomotive capable of traveling on said track, a lever having its inner end pivotally connected with said gear at the sides thereof whereby said lever is capable of a vertical swinging movement, the yoke swiveled within the forward end of said lever, the locomotive having its frame secured to said yoke, the steam supply and exhaust pipes leading from any suitable point to the steam cylinders of the locomotive and provided with flexible joints whereby said pipes will not become distorted by the circuitous travel of the locomotive in ascending and descending grades, substantially as set forth.

10. In a motor, an exterior track or way and interior driving gear, and a fixed generator of expansive gas, a locomotive traveling on the way and operatively connected with the interior driving gear, and connections from the generator to the locomotive whereby the power supply may be maintained while the locomotive is moving, all combined substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EPHRAIEM CHAQUETTE.

Witnesses:

F. W. SMITH, Jr.,

M. T. LONGDEN.