May 3, 1927. 1,627,249

J. W. PAGE

REVOLVING DERRICK

Filed Oct. 6, 1924 4 Sheets-Sheet 1

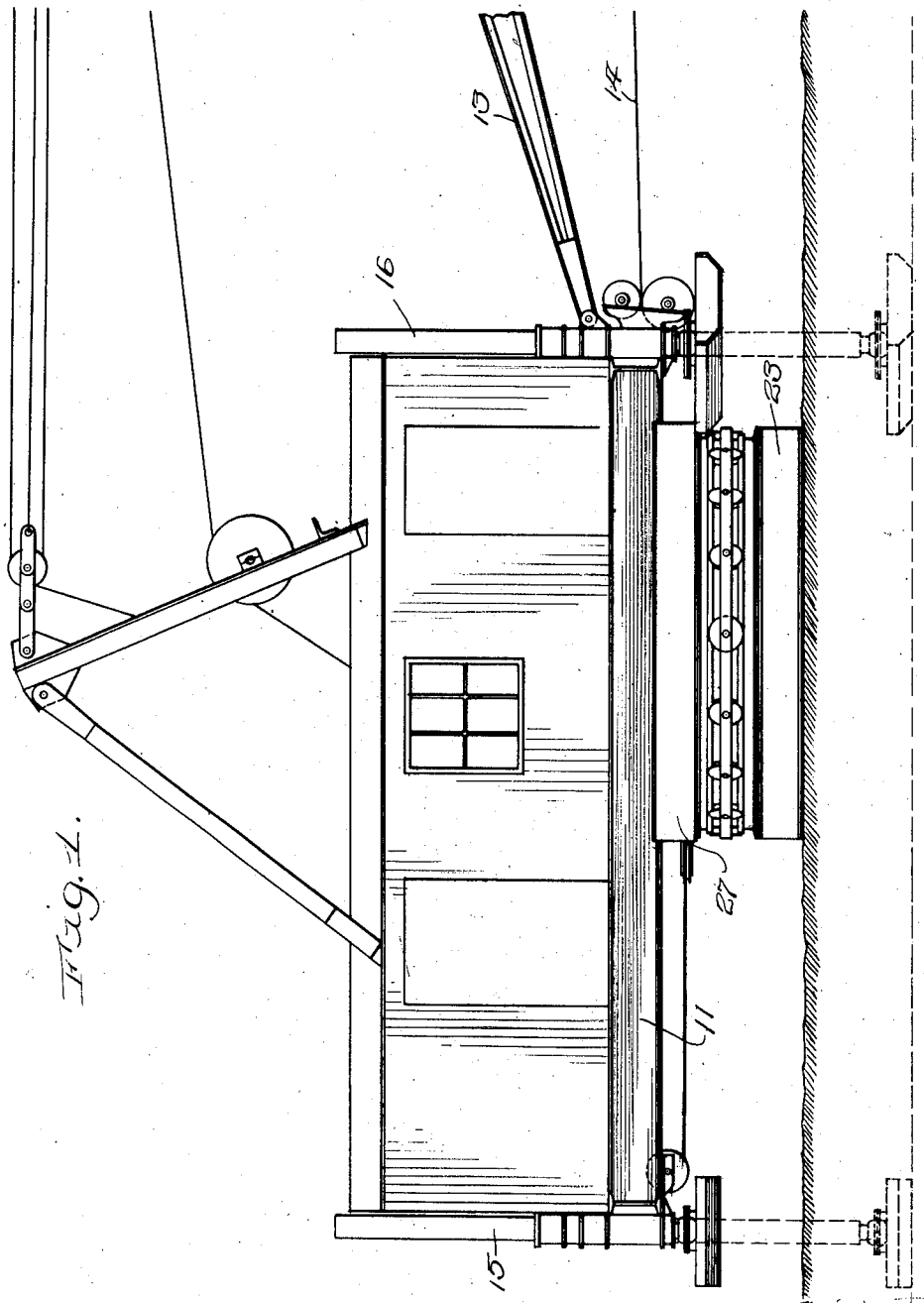


Fig. 1.

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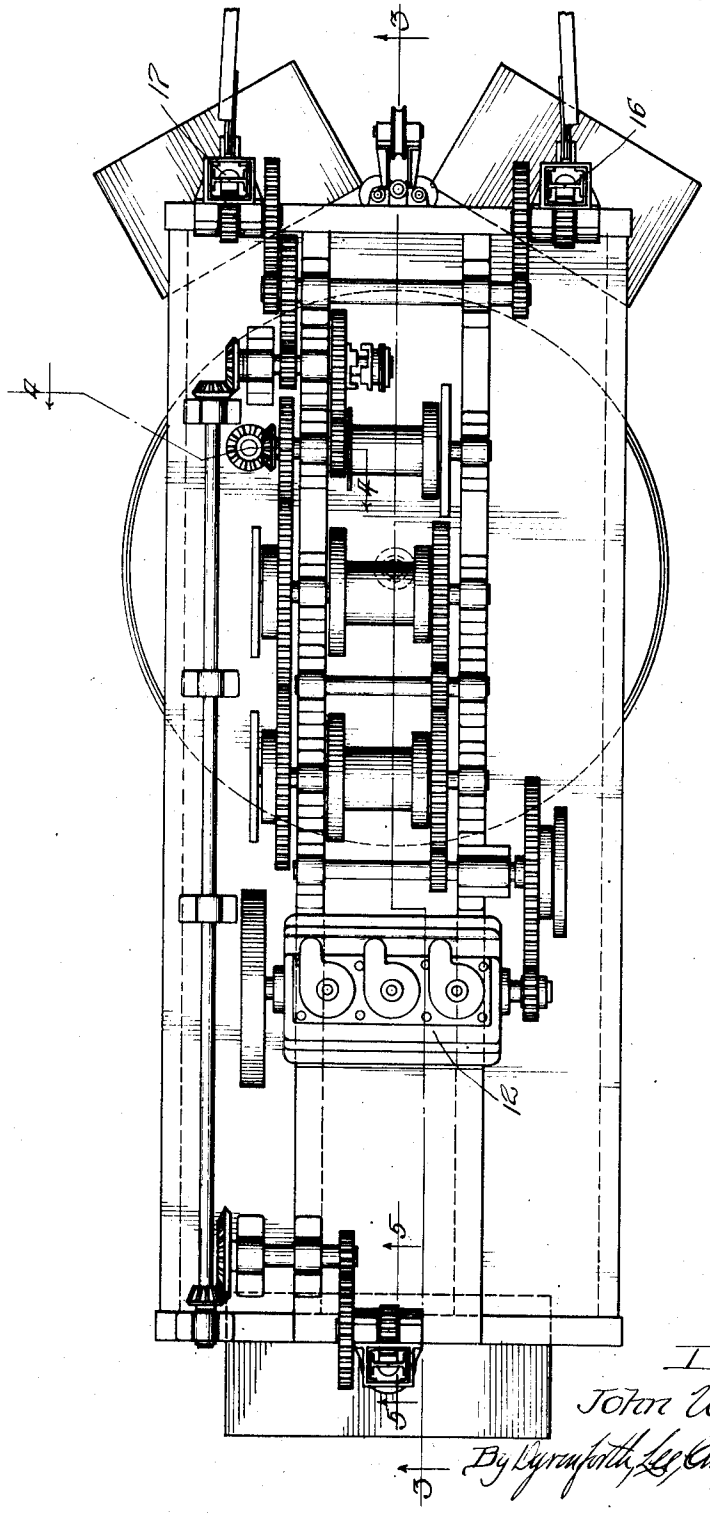


Fig. 2.

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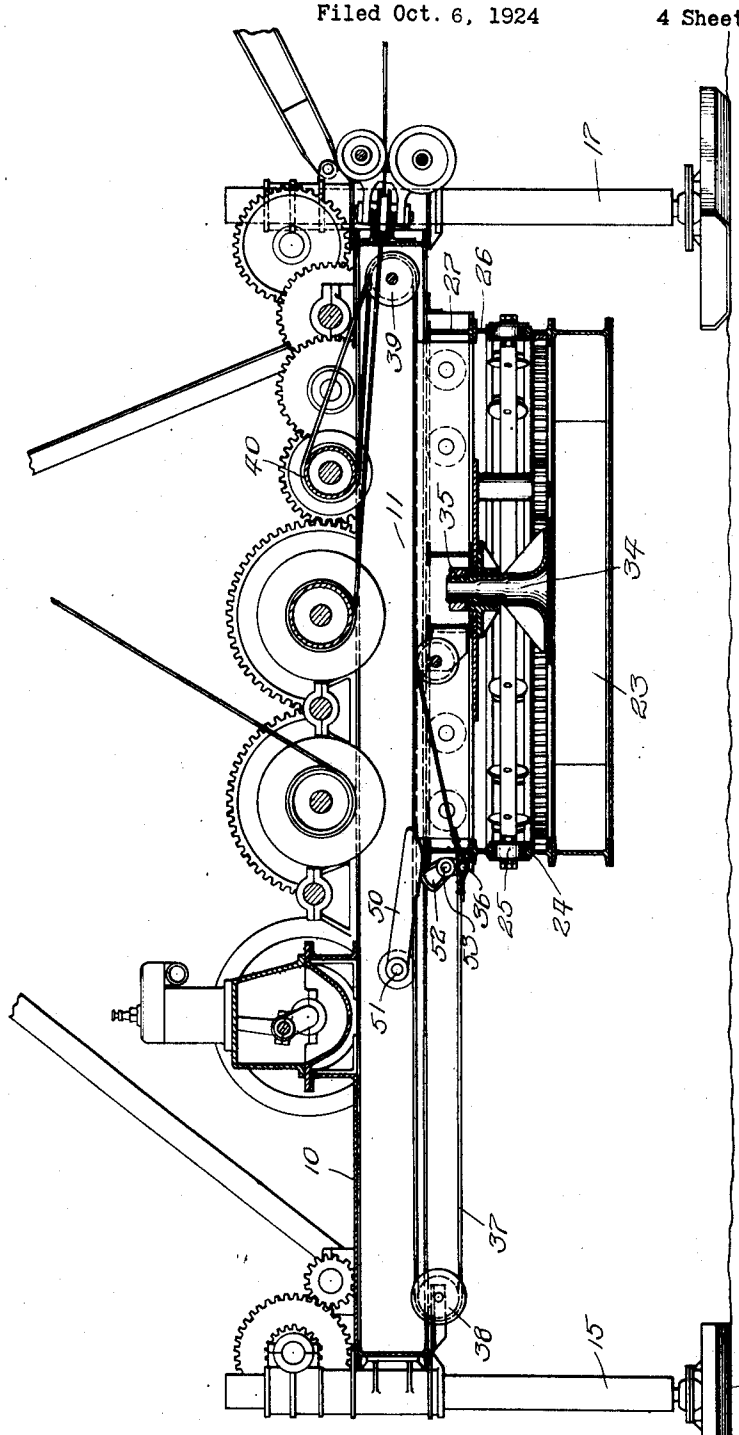


Fig. 3.

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Fig. 5.

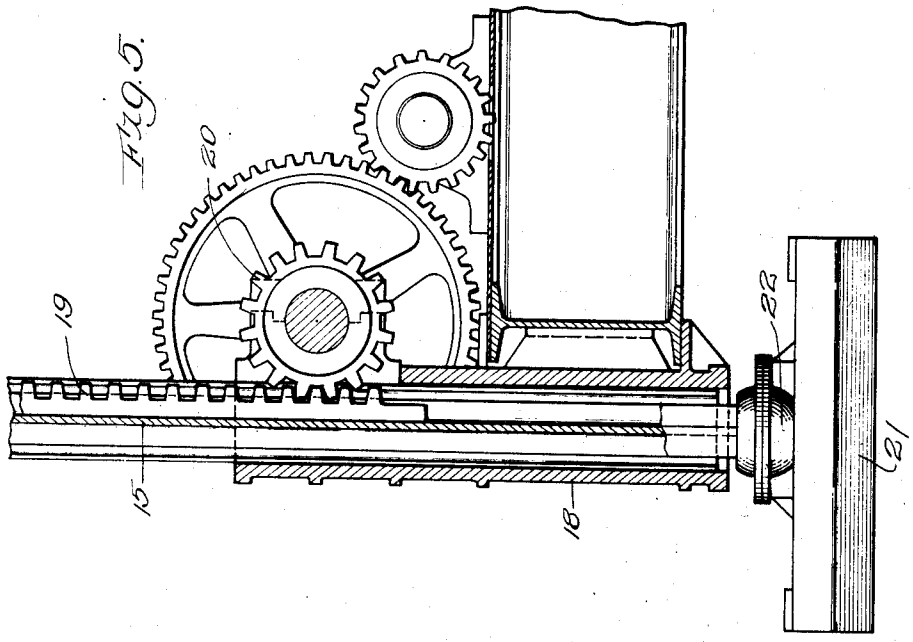
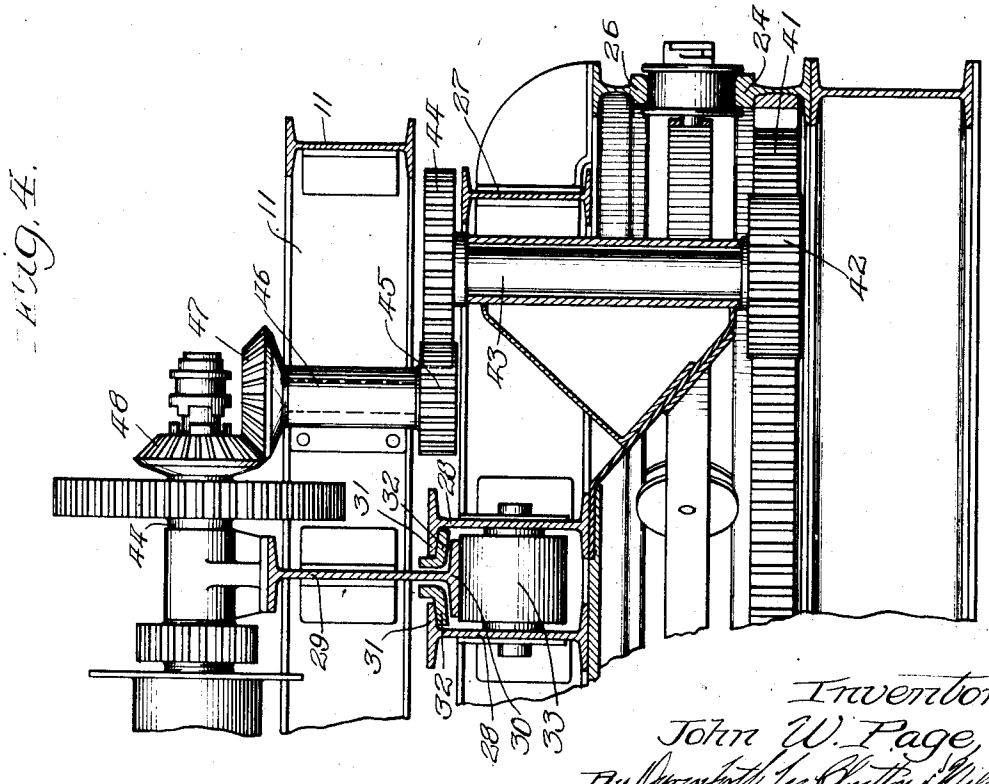


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN W. PAGE, OF CHICAGO, ILLINOIS.

REVOLVING DERRICK.

Application filed October 6, 1924. Serial No. 741,923.

This invention relates to improvements in revolving derricks, including in such term revolving cranes, revolving excavators and the like. My improved revolving derrick is so constructed that it may be readily moved in any direction and also around curves or angles. In the practice of my invention I make use of the turntable forming an integral part of the revolving derrick to assist in moving the derrick around corners. The turntable, therefore, performs a double function. That is, it performs its regular duty in connection with the operations of the revolving derrick while excavating, for example; and also forms a part of the moving apparatus as will be described more in detail hereinafter.

My improved revolving derrick is also easy and simple to construct and operate. Other features and advantages of my invention will appear more fully as I proceed with my specification.

In that form of device embodying the features of my invention shown in the accompanying drawings—

Fig. 1 is a view in side elevation showing a revolving derrick, here shown, for purpose of illustration, as an excavator (partly shown);

Fig. 2 is a similar view in top plan;

Fig. 3 is a view taken as indicated by the line 3—3 of Fig. 2;

Fig. 4 is a view taken as indicated by the line 4—4 of Fig. 2 on an enlarged scale; and

Fig. 5 is a view taken as indicated by the line 5—5 of Fig. 2 on an enlarged scale.

As shown in the drawings, 11, 11 indicates suitable transverse and longitudinal beams which are suitably joined and braced to form a substantially flat rectangular structure. The structure 11 may be completely or partially covered with decking 10, as desired. The particular construction of the rectangular flat structure 11 forms no part of the present invention and consequently is not shown in detail here. Any well-known practice may be followed in forming a suitably shaped flat structure adapted to carry the machinery, or other apparatus used.

Mounted on the structure 11, in any well-known manner, is the engine or motor, such as an internal combustion engine as indicated by 12, designed to furnish the necessary power to operate the excavating or other machinery carried by the support and also to operate the support itself, as will be described more in detail hereinafter. For the purpose of illustration merely, I have here shown as mounted on the support a boom 13 from the outer end of which (not shown) is supported an excavating or scraper bucket adapted to be hauled by a rope 14 in order to drag the bucket through the material to be loaded in accordance with well-known practice. The particular construction and operation of the excavating machinery forms no part of the present invention and is therefore only partly shown herein. It is obvious that the support or deck 10 might also carry some other kind of excavating machinery, a dredge, a pile driver, or scraper, or any similar mechanism or apparatus.

At the center of the rear end of the support there is mounted a vertically movable spud, leg, or supporting member 15. Two similar supports 16 and 17 are mounted at the forward end of the support near the corners. Since each of the vertically movable supports, 15, 16 and 17 is similar in construction and operation, I will describe in detail but one. For example, the support 15 (see Fig. 5) includes a vertically movable post, or elongated member, adapted to slide vertically in a guide 18. The face of the sliding member adjacent the deck or support is provided with a rack bar 19 engaged by a pinion 20 adapted to be rotated by a suitable train of gears connected to the motor 12, as shown; so that by rotation of the pinion 20, the support, leg, or spud 15 may be raised or lowered as desired. The bottom of the spud, or leg, or support 15 is provided with a flattened shoe 21 connected to the support 15 by a universal joint 22, as shown, in order to permit the shoe to rest more or less evenly on slanting or uneven surfaces. It is to be understood that the legs 16 and 17 are similarly constructed and adapted to be raised or lowered in a similar manner.

Underneath the structure 11, 11, there is supported a turntable adapted to hang from said structure when the legs 15, 16 and 17 are lowered, as shown in Fig. 3. The turntable is also adapted for longitudinal sliding movement with respect to the rectangular structure 11, 11. The turntable referred to comprises a circular supporting base 23 having mounted thereon a circular rail 24.

25, 25 indicates a series of flanged wheels adapted to run on the rail 24. Above the wheels 25 is arranged another circular rail 26 carried on the underside of the upper part 27 of the turntable. The upper part 27 of the turntable is provided with a pair of I-beams 28, 28 on each side, arranged as shown in Fig. 4. The structure 11 carries on its under surface at each side a longitudinally arranged I-beam 29 having its lower flange 30 lying underneath the adjacent edges 31, 31 of the pair of I-beams 28, 28. By means of this construction (see Fig. 4), the upper part 27 of the turntable is supported by engagement of the edges 31 of the I-beams 28, 28 on the flange 30. Strips of anti-friction metal 32, 32 are placed between the engaging surfaces in order to lessen friction. It will be seen therefore that the upper part 27 of the turntable hangs on the I-beams 29, 29 and it is to be understood that on the lower side of the rectangular structure 11 there are two such I-beams, one on each side, extending substantially the entire length of the structure so that the turntable is adapted to slide underneath the structure from one end to the other. When the legs 15, 16 and 17 are down, the turntable hangs by engagement of the edges of the flanges 31 on the edges of the flange 30, with the anti-friction metal 32 between. When the legs 15, 16 and 17 are raised so that the weight of the excavating device is resting on the turntable, the I-beams 29 move downwardly slightly until their lower flanges 30 rest on the supporting rollers 33 mounted between each pair of I-beams 28, 28. When the device is resting on the turntable, with the legs raised, the structure may be moved backwardly and forwardly longitudinally on the rollers 33.

When the turntable is raised; that is, when the legs 15, 16 and 17 are down, as shown in Fig. 3, the lower part 23 of the turntable hangs from the upper part by means of the central supporting pivot 34 which has its upper end projecting up into the part 27 and provided with a head and a thrust bearing 35 so that when the turntable is thus supported the lower circular part 23 hangs from the upper part 27.

The following means are provided for sliding the turntable backwardly and forwardly on the structure, or sliding the structure backwardly and forwardly on the turntable, depending upon whether the structure is resting on the turntable or on the legs 15, 16 and 17. Attached to the upper part 27 of the turntable 36 is a rope 37 extending around a pulley 38 at one end of the structure 11 and thence around a pulley 39 at the other end of the structure 11, thence over a drum 40, thence back over the pulley 39 and thence back to the point of attachment 36. It is obvious that rotation of the drum 40 will serve to pull the turntable backwardly and forwardly under the structure 11. The drum 40 may be rotated in any suitable manner; for example, by any suitable gear connections to the motor 12.

The following means are provided for rotating the turntable. The circular rail 24 carries an internal gear 41 with which meshes a pinion 42 mounted on the lower end of a vertical shaft 43 carried by the upper part 27 of the turntable. The upper end of the shaft 43 carries another pinion 44 adapted to be engaged by a pinion 45 mounted on a vertical shaft 46 carried by the structure 11. The shaft 46 carries on its upper end a bevel gear 47 meshing with a bevel gear 48 mounted on the shaft 49, which, in turn, may be rotated by any suitable gear connections with the motor 12, or in any other desired manner. The particular gear connections between the motor and the pinion 45, or the drum 40, or the pinions 20, used to operate the spuds, form no part of the present invention, and, consequently, are not shown or described in detail herein. It is obvious that any suitable motor, or engine, connected in any suitable manner, may be used to drive any of these parts.

It is to be noted that the pinion 45 is carried by the structure 11 and the pinion 44 carried by the upper part of the turntable. Consequently, these two pinions will not be in mesh all the time that the turntable slides backwardly or forwardly underneath the structure. There is only one position in which these pinions will be in mesh. I have here shown these pinions in mesh when the turntable is in the position shown in Figs. 1 and 2; that is, at the forward end of the support. When in this position, with the pinions 44 and 45 in mesh, the turntable may be rotated. In its other positions as it slides back of this forward position, the pinions 44 and 45 are disengaged so that the turntable cannot be rotated. If desired, however, there could be provided another rotating pinion 45 at the other end of the support.

In the operation of the device, the vertically movable legs 15, 16 and 17 are forced down until the turntable is raised off of the ground. The turntable is then slid to the front end of the device. The legs are then raised until the excavator rests on the turntable. The excavator is then slid forwardly on the turntable, until the turntable is at the rear end of the excavator. The legs are then again lowered until the turntable is off of the ground, and the turntable then again slid to the front of the excavator. It will be seen that in this manner, the excavator can be moved or caused to "walk" over the surface. It is to be noted particularly also that when the excavator is resting on the turntable while it is at the forward end with

the gears 44 and 45 in mesh, that the same may be rotated as desired before again lowering the legs in order to lift the turntable off the ground. By this construction, therefore, it is possible for the excavator to travel or be moved not only in a straight line but also around any desired angle or curve.

50 indicates a stop adapted to hold the turntable at the extreme forward end of its slide with the gears 44 and 45 in mesh. This stop is pivoted at 51 and when down, engages the upper part 27 of the turntable to prevent it from sliding back. When the line 37 is pulled, however, the short lever 52 is rocked on its pivot 53 to raise the stop 50 and disengage it from the turntable. The point of attachment 36 of the rope 37 to the turntable is on the lower end of the pivoted lever 52.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims, in which it is my intention to claim all novelty inherent in my invention as broadly as possible in view of the prior art.

It is to be noted that the turntable referred to herein constitutes an integral part of the revolving derrick as a whole. That is, a turntable is used during the regular operations of the revolving derrick and is necessary to its operation. This turntable is also made use of and forms a part of the moving mechanism of the apparatus. In fact, the bottom part of the turntable constitutes the regular supporting base for the revolving derrick as such. Thus, the superstructure of the revolving derrick is rotatably supported on its supporting base.

What I claim as new, and desire to secure by Letters Patent, is:

1. A revolving derrick comprising a superstructure and a supporting base; said superstructure being rotatably and slidably mounted on top of said supporting base; and means for raising or lowering said superstructure, said supporting base adapted to hang from the underside of said superstructure and be supported thereby when said superstructure is raised.

2. A revolving derrick comprising a superstructure and a supporting base; said superstructure being rotatably and slidably mounted on top of said supporting base; locking means for holding said supporting base at one end of its sliding movement; and means for raising or lowering said superstructure, said supporting base adapted to hang from the underside of the superstructure and be supported thereby when said superstructure is raised.

Witness my hand this 3 day of October, 1924.

JOHN W. PAGE.