T. R. ARDEN.

TOY CRANE OR DERRICK.

APPLICATION FILED JAN. 16, 1918.

1,283,022. Patented Oct. 29, 1918.

Fig 1

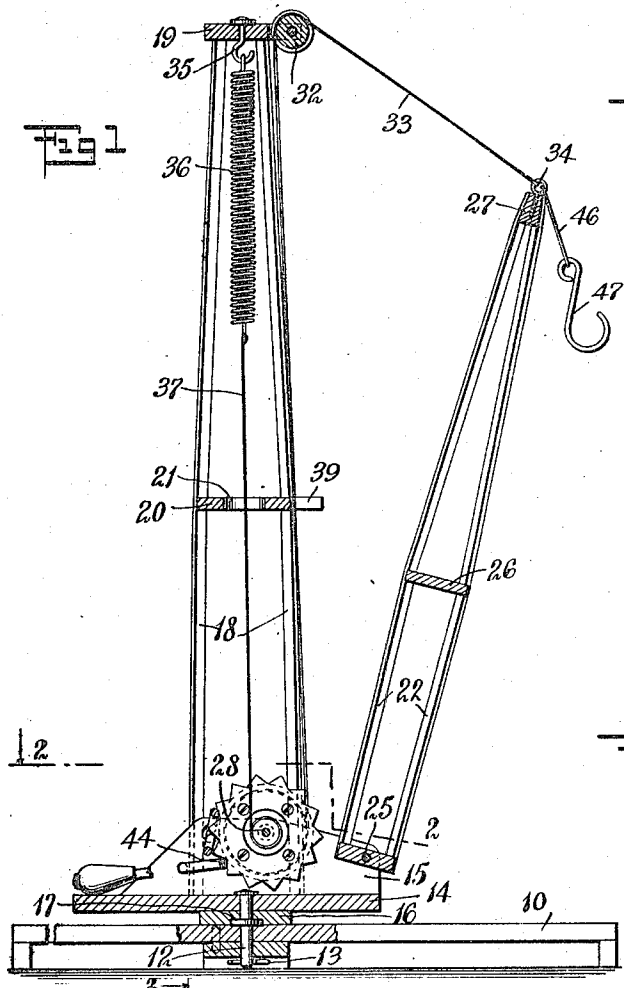


Fig 4

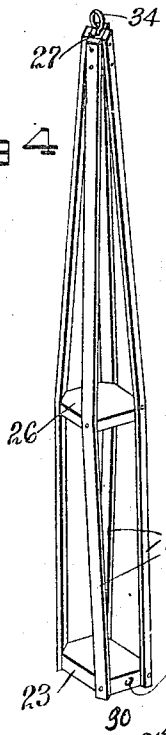


Fig 3

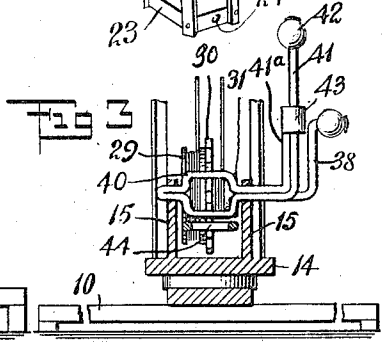
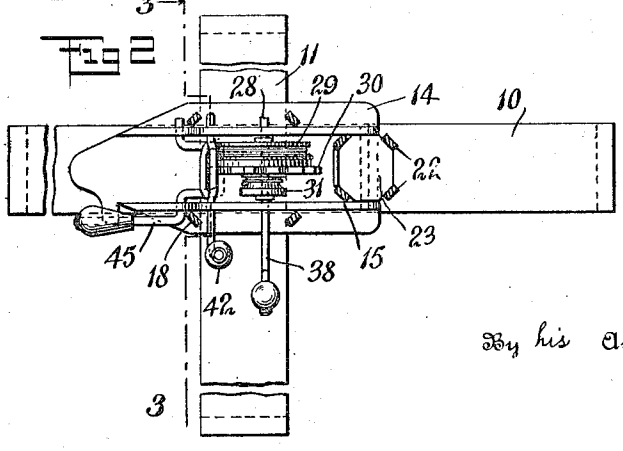


Fig 2



Inventor

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By his Attorney

O'Brien

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THOMAS RAYMOND ARDEN, OF GUTTENBERG, NEW JERSEY, ASSIGNOR TO ARDEN MANUFACTURING CORPORATION, OF GUTTENBERG, NEW JERSEY, A CORPORATION OF NEW YORK.

TOY CRANE OR DERRICK.

1,283,022. Specification of Letters Patent. Patented Oct. 29, 1918.

Application filed January 16, 1918. Serial No. 212,002.

To all whom it may concern:

Be it known that I, THOMAS RAYMOND ARDEN, a citizen of the United States of America, residing at Guttenberg, in the county of Hudson, State of New Jersey, have invented certain new and useful Improvements in Toy Cranes or Derricks, of which the following is a specification.

My invention relates to a toy crane or derrick, in which the movement of the boom is automatically effected and controlled.

The principal object of the invention is to provide a simply constructed toy, enabling a child to readily perceive the mechanical principles involved in the construction and operation of cranes and derricks.

A preferred embodiment of the invention is illustrated in the accompanying drawing, in which—

Figure 1 is a side elevational view, partly in section, of my improved crane or derrick;

Fig. 2 is a horizontal sectional view on the line 2—2 of Fig. 1;

Fig. 3 is a vertical sectional view on the line 3—3 of Fig. 2; and

Fig. 4 is a perspective view of the boom.

The derrick is supported upon a frame which consists of the members 10 and 11, held together in crossed relation by the bolt or pin 12, through the bottom of which the cotter pin 13 may be inserted.

Swiveled to the supporting frame by the pin 12 is the derrick platform, which comprises the base 14 and the side walls 15. Interposed between the platform and the upper member of the supporting frame 10—11 is a washer 16 into a groove of which sets a collar 17 formed on the pin 12 intermediate its ends.

Extending upwardly from the platform is a mast, which preferably comprises uprights 18, four in number, arranged in pairs at opposite sides of the side walls 15, and converging toward the top where they are secured together by means of a plate or block 19. At an intermediate point the uprights which constitute the mast are braced and held in properly spaced relation by an additional block 20, having a central opening 21.

Pivotally supported near the front end of the platform is a swinging boom which is constructed somewhat like the mast and comprises four rods 22, which converge toward their upper ends. At their lower ends these rods are secured together by a block 23 provided with an opening 24 therethrough to receive a pin 25 which is supported in the side walls 15 of the platform and upon which pin the boom swings. Intermediate their ends the boom rods are braced and held spaced apart by a block 26, and the upper converged ends of the rods 22 are secured together by a block 27.

Bearing in the side walls 15 of the platform is a shaft 28 upon which is mounted a cable drum 29, adjacent thereto a toothed disk or sprocket wheel 30, and adjacent to the latter a winding pulley 31. Carried by the block 19 is a sheave 32 over which is rove a cable 33 one end of which is attached to an eye 34 in the block 27 at the top of the boom, and the other end of which cable is attached to the drum 29. The cable 33 is sufficiently long to be wound about the drum 29 a number of times when the boom is upright.

Suspended from a hook 35 in the block 19 is one end of a coiled retractile spring 36, the other end of which is secured to a rope or cable 37 adapted to be wound on the pulley 31. The rope 37 passes through the opening 21 in the block 20. The cables 33 and 37 are reversely wound on the drum 29 and pulley 31 respectively, that is, when the cable 33 is paid out the cable 37 is wound on the pulley 31, and when the cable 33 is wound on the drum 29 the cable 37 is unwound from the pulley 31. The shaft 28 is extended to form the crank or operating handle 38, and the mast is provided with a stop 39 to prevent impact of the boom against the mast.

I provide a suitable governor mechanism for controlling the ascent of the boom, and as shown in the drawing, this preferably consists of a form of escapement which includes a rectangular horizontal frame 40 mounted to oscillate in the side walls 15 of the platform. The frame 40 is extended to form the substantially vertical arm 41, having a ball 42 at its top, and provided with the weighted sleeve 43 slidable on the arm 41. The upward movement of the governor sleeve 43 is limited by the ball 42 and its downward movement is limited by the arm 41^a which is about one half as long as the arm 41. The frame 40 is so positioned with relation to the toothed disk 30, that as the for-

mer oscillates its sides will alternately engage the teeth of the disk during rotation of the latter.

Pivotally mounted in the side walls of the platform, toward its rear end, is a brake which comprises the yoke 44 adapted to engage the teeth of the disk 30, and a rearwardly extending handle 45 by means of which the brake may be operated. The weight of the handle 45 is greater than that of the yoke 44, so that the latter has a normal tendency to engage the teeth of the disk 30 and lock the latter against rotation.

Suspended by a link 46 from the eye 34 at the top of the boom, is a load hook 47 capable of holding a substantially weight.

The operation of the device above described is as follows:—Assuming the parts to occupy substantially the positions shown in Fig. 1, if it be desired to lower the boom to receive a load on the hook 47 the brake 44 is moved out of engagement with the sprocket 30 by raising the handle 45 and the handle 38 is rotated in an anticlockwise direction. The shaft 28 will then be rotated to wind up the cable 37 on the pulley 31 and pay out the cable 33 from the drum 29. As the cable 37 is wound on the pulley 31 the spring 36 is extended and placed under tension. The escapement 40 oscillates without any appreciable effect on the speed of the sprocket 30. When the boom has been lowered the desired distance the brake 44—45 is allowed to fall back into engaging position with the sprocket and the load is attached to the hook 47. Thereupon the brake 44 is released and the spring 36 will contract, pulling up the cable 37 and causing the shaft 28 to rotate in a direction opposite to that in which it was first rotated. As the shaft 28 thus rotates the cable 33 will be wound up on the drum 29 raising the boom with its load, until either the boom strikes the stop 39, or the brake is engaged with the sprocket to stop rotation of the shaft 28. During this rotation of the sprocket 30 the escapement 40 oscillates and if the sprocket speed increases unduly the sleeve 43 will ride up on the arm 41, reducing the speed of the sprocket, and acting after the manner of the usual ball governor. It will of course be understood that the brake positively controls the operation of the entire device, and if the brake is set the boom can not be moved by the cables.

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

1. In a toy crane or derrick, the combination with a mast, of a swinging boom, a winding drum, a cable extending from the boom to the drum, a winding pulley, a cable having one end attached to said pulley, a tension member attached to the other end of said second cable, and an escapement mechanism for controlling the speed of movement of said boom.

2. In a toy crane or derrick, the combination with a platform, of a mast supported thereby, a boom pivotally mounted on said platform, a shaft rotatably supported by said platform, a winding drum, a winding pulley and a sprocket wheel on said shaft, a cable having one end attached to said boom and its other end attached to said drum, a second cable having one end attached to said pulley, a tension member attached to the other end of said second cable, and an escapement coöperable with said sprocket wheel.

3. In a toy crane or derrick, the combination with a platform, of a mast supported thereby, a boom pivotally mounted on said platform, a shaft rotatably supported by said platform, a winding drum, a winding pulley and a sprocket wheel on said shaft, a cable having one end attached to said boom and its other end attached to said drum, a second cable having one end attached to said pulley, a tension member attached to the other end of said second cable, an escapement coöperable with said sprocket wheel, and a brake adapted to be engaged with and disengaged from the teeth of said sprocket wheel.

4. In a toy crane or derrick, the combination with a shaft, of a winding drum and a winding pulley mounted thereon in axial alinement, a swinging boom, a cable connecting the swinging boom with the winding drum, a second cable having one end attached to said pulley, and a tension member connected to the opposite end of said cable and adapted when, under tension, to rotate the drum and the pulley in unison.

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

THOMAS RAYMOND ARDEN.

Witnesses:

CLARICE FRANCK,

BERTHA MUELLER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."