

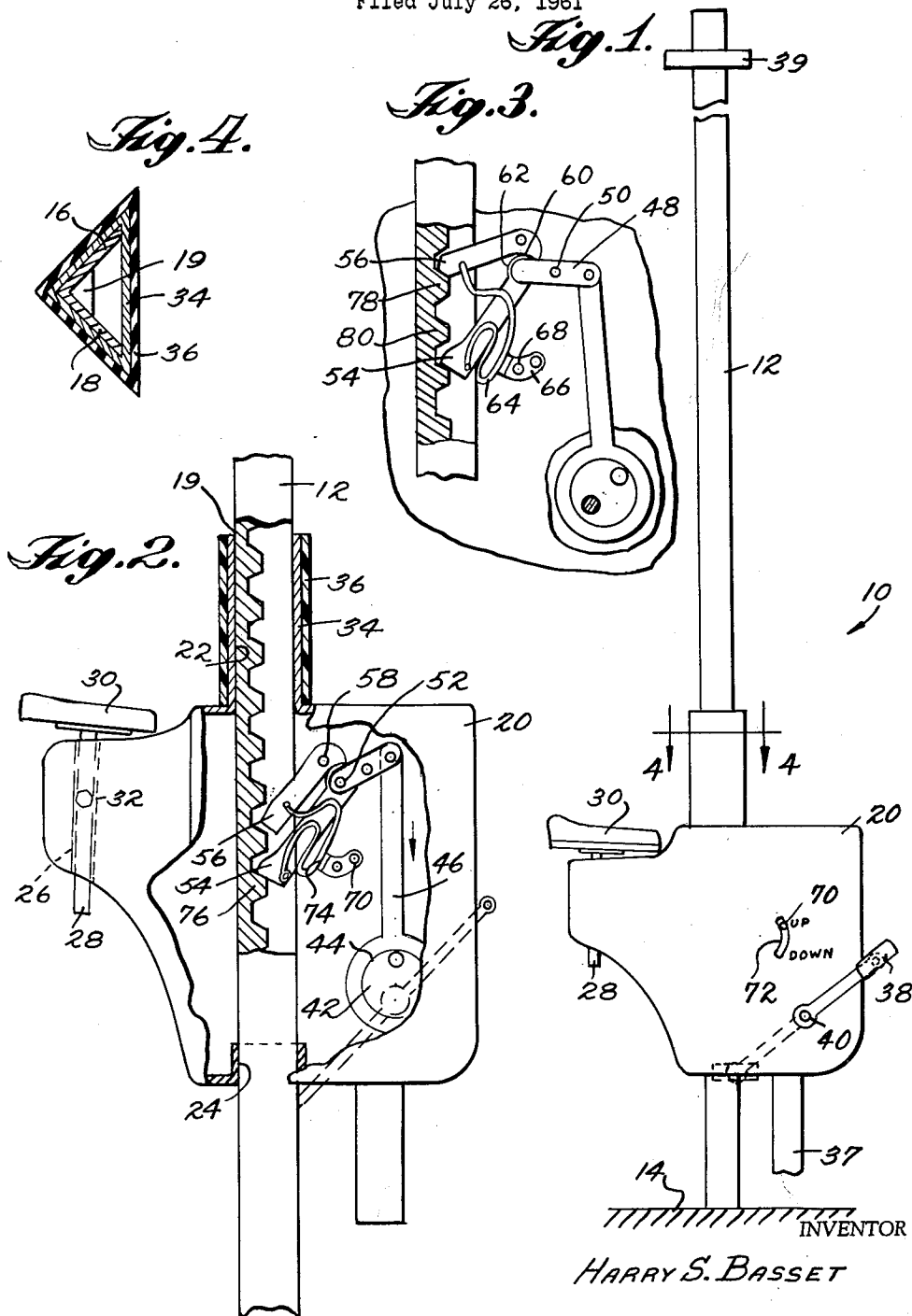
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MONOPOLE ELEVATOR

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MONOPOLE ELEVATOR

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This invention relates generally to a monopole elevator device, and more particularly to a monopole elevator for use by children.

An object of this invention is the provision of an amusement device for children which is safe, easy to use, and easily maintained.

Another object of this invention is the provision of a monopole elevator which is operated by means of a pawl mechanism.

A still further object of this invention is to provide a monopole elevator having a housing and pedals mounted in the housing for rotation, which pedals operate a pawl mechanism for successively engaging and disengaging a series of notches in a pole whereby the housing is translated along the length of a substantially vertically disposed pole.

Yet another object of this invention is the provision of a monopole elevator having pedal means for moving the elevator first in one direction on the pole, and having means to reverse its movement, for translating the elevator in a second and opposite direction on the pole.

Other objects and advantages of this invention will become apparent in the course of describing this device more thoroughly, in combination with the drawings, in which:

FIGURE 1 is a side elevational view of the monopole elevator which forms the basis of this invention;

FIGURE 2 is a side elevational view of the housing shown in FIGURE 1, partially cut away and in section;

FIGURE 3 shows the cam, pitman, and pawl mechanism in a position somewhat more advanced from that shown in FIGURE 2; and

FIGURE 4 is a sectional view of the handle arrangement taken along lines 4-4 of FIGURE 1.

Referring now more particularly to the drawings, the monopole elevator of this invention is shown generally at 10 in FIGURE 1. The elevator comprises a pole 12 which is secured in the ground 14 by cementing or other suitable means. Alternatively, the pole may be suspended from a tripod or other elevated structure. Pole 12 is generally angular in shape and has a series of teeth 19 formed on its surface between angle portions 16 and 18 at equally spaced intervals along its length. A stop member 39 is secured to the upper end of the pole to prevent housing member 20 from advancing beyond this point. Mounted on pole 12 for translational movement is housing member 20 having suitable sliding surfaces 22 and 24. Mounted within the housing member 20 on one side thereof is a sleeve member 26 disposed in a generally vertical direction. This sleeve 26 is suitably positioned to receive base 28 of seat member 30. The seat may be adjusted by means of set screw 32 which is mounted on the housing and sleeve 26, and which is screwed into engagement or out of engagement with base 28.

An upstanding member 34 which is secured to the housing member by welding or other suitable means, serves a two-fold purpose. First, it provides a sliding surface 22 bearing upon the surface of pole 12; secondly, it serves as a handle means for the child sitting upon the saddle 30. The member 34 may be covered with rubber or other resilient material, as at 36, in order to provide a firm gripping surface. In the alternative, a pair of handle-bars may be mounted on the upstanding portion

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34 having suitable handle grips mounted on their end portions.

Secured to the underside of the housing member 20, as by welding or other suitable means, is a support member 37 which engages the ground when the monopole elevator is not in use or when a child is mounting it or demounting therefrom.

A pair of pedals 38 are mounted on the housing member 20 for rotation on axle 40. Fastened to axle 40, for example, by welding, is a cam 42 placed in eccentric relationship with respect to the axle. Journalled about the cam 42, as at 44, is a pitman 46 which extends upwardly from the cam and axle. The extreme end of the pitman 46 opposite the axle 40 and the cam 42 is pinned to lever 48 for relative movement therewith. This lever 48 is pinned to pin member 50 which is fixedly secured to housing 20. The opposite end of lever 48 is pinned as at 52 to pawl member 54 for relative rotation therewith. A second pawl member 56, is pinned for rotation about a pin member 58 fixedly secured to housing 20. Pawl member 56 is shaped as at 60 so as to mate surface 62 of pawl member 54.

Attached to each of the pawl members and connecting them together is a spring 64. A latch member 66 is mounted for pivotal movement about fixed pin 68. A pin element 70 which is located on one end of latch member 66, and which passes through slot 72 of the housing member 20, may be used to move the surface 74 of the latch member 66 in and out of engagement with the spring 64. When surface 74 engages the spring 64 the pawl members 54 and 56 are biased toward the teeth 19 of pole 12 by a greater force than when surface 74 of latch 66 is not engaged with spring 64.

Operation

In operation, the monopole elevator is used as follows.

The child using the apparatus sits upon the saddle member 30, which can be adjusted by means of set screw 32 to suit his height. The child moves pin element 70 to the uppermost portion of slot 72, the portion marked, "Up." This moves surface 74 of latch member 66 into engagement with the spring 64, assuring that the elevator device is now ready for movement in an upward direction. The child then places his feet on the pedals 38, rotating them in a clockwise direction, as viewed from the right-hand side of the apparatus.

As the pedals 38 are rotated, they in turn rotate axle 40 and the cam 42 secured thereto. The rotation of the cam 42 will cause the pitman 46 to oscillate in an up and down motion. FIGURE 2 shows the pitman 46 resting in a top dead center position on the cam member 42, the pawl member 54 bearing upon tooth member 76. The spring 64 is at all times acting to force both pawl members into engagement with the teeth 19.

As the child continues to pedal, the pitman 46 is moved downwardly from the position shown in FIGURE 2. This rotates lever 48 in a clockwise direction about pin 50. The pawl member 54 remains engaged with the tooth 76, but the pawl 56 ratchets upwardly against the surfaces of teeth 19 until it comes into engagement with tooth 78, as shown in FIGURE 3. Continued rotation of the pedals 38, axle 40 and cam 42 causes the pitman 46 to move even further downwardly. Lever 48 continues to rotate about pin 50. The load of the housing and the child sitting thereon is gradually transferred from pawl 54 to pawl 56, until the point is reached at which the pitman 46 journalled in cam 42 is located in a bottom dead center position therein. After pitman 46 has been moved to this bottom dead center position, the lever 48 rotating in a clockwise direction causes the pawl member 54 to ratchet against the teeth 19 to a position adjacent tooth 80.

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At this point, the entire load rests upon the pawl member 56. Continued pedaling causes the pitman 46 to move in an upward direction, thereby rotating the lever 48 in a counter-clockwise direction about pin member 50. The lever member 48, acting through the pin member 50, forces the pawl member 54 into engagement with the teeth 19, and in this instance, into engagement with the tooth 80. Continued rotation of the pedals will once again place the full burden on pawl member 54; pawl member 56 will ratchet upwardly to the next tooth, and this process will be repeated until the child comes to the top of the pole, at which point the top end of member 34 bears against stop member 39, or until the child wishes to return to earth.

When the child wishes to return to the ground, he pushes the lever 70 to the down position. This moves the surface 74 of the latch member 66 out of engagement with the spring 64. This movement serves to bias the pawls apart a greater extent than previously when surface 66 abutted spring 64. To move in a downward direction, the child continues to pedal in a clockwise direction as viewed from the right hand side. As the pitman 46 moves downwardly, as viewed in FIGURE 2, the pawl member 56 comes into engagement with tooth 80. The load is then transferred gradually from pawl member 54 to pawl member 56 until the pawl member 56 bears the total load. Continued movement of the pitman in a downward direction and the corresponding greater size rotation of lever 48 will move the pawl member 54 out of engagement with the tooth on which it is resting. The tooth is biased outwardly by the spring 64, the total load remaining on pawl member 56.

As the pitman 46 moves past bottom dead center and rotates the lever member 48 in a counterclockwise direction, the pawl member 54 will again come into engagement with a tooth further down the pole 12. Continued movement of the pedals, axle, cam, pitman and lever will cause the load to be transferred from pawl member 56 to pawl member 54. When the total load has been transferred to the pawl 54, the spring 64 will urge pawl 56 out of engagement with tooth 80. Pawl member 56 will then move downwardly and into engagement with the next lower tooth, whereupon the process just described will be repeated. Continued pedaling will cause this process to be repeated again and again until the child once again returns to the ground.

A structure has therefore been described which is proposed as an amusement device for use by children. The monopole elevator can be produced at relatively small cost, is sufficiently safe for use by children, and is easily maintained. It should be noted that the device as herein described might not only be employed for the use of children but may also be used by adults for the purpose of exercise. It might also be used as a substitute for step ladders, industrial units preferably being motorized.

Although the preferred embodiment of the device has been described, it will be understood that within the

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purview of this invention various changes may be made in the forms, details, proportions, and arrangement of parts, the combination thereof, and the mode of operation, which generally stated consist in a device capable of carrying out the objects as set forth, as disclosed and defined in the appended claims.

I claim:

1. An amusement device comprising: a substantially vertical post having a plurality of teeth formed in its surface; a housing mounted for slidable movement on said post; an upstanding member fixedly attached to said housing surrounding said post for a substantial distance thereabove; a seat member secured to said housing; an axle mounted in said housing; eccentric means mounted on said axle; lever means pivotally mounted on said housing; means connecting said eccentric means and one end of said lever means; a first pawl member pivotally mounted at the other end of said lever means; a second pawl member adjacent said first pawl member and mating therewith pivotally mounted on said housing; spring means to normally engage the free ends of said pawl members with said teeth; and means to rotate said axle, whereby said connecting means is reciprocated substantially vertically to pivot said lever means thereby alternately engaging and disengaging each of said pawl members with successive teeth to move said housing in a given direction along said post.

2. A device according to claim 1 including means to reverse the direction of movement of said housing on said post.

3. A device according to claim 1 including means to adjustably mount said seat member on said housing.

4. A device according to claim 1 including a member fixedly attached to said vertical post adjacent the top end thereof to limit upward movement of said housing on said post.

5. A device according to claim 1 wherein said post is supported substantially vertically relative to the ground and wherein said housing includes a depending support member to make contact with the ground to limit downward movement of said housing on said post.

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