Apr. 24, 1923. 1,452,608

J. P. KIRST

TOY ELEVATOR

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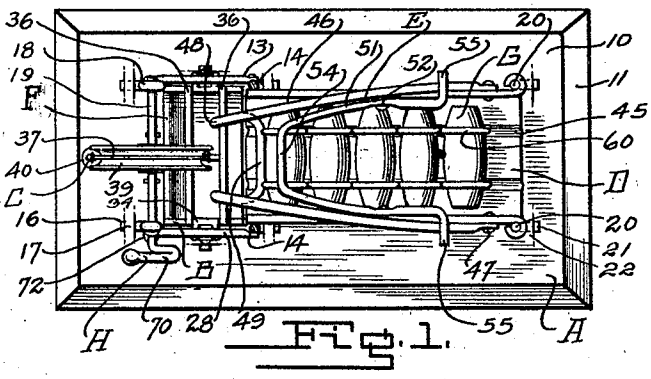


Fig. 1.

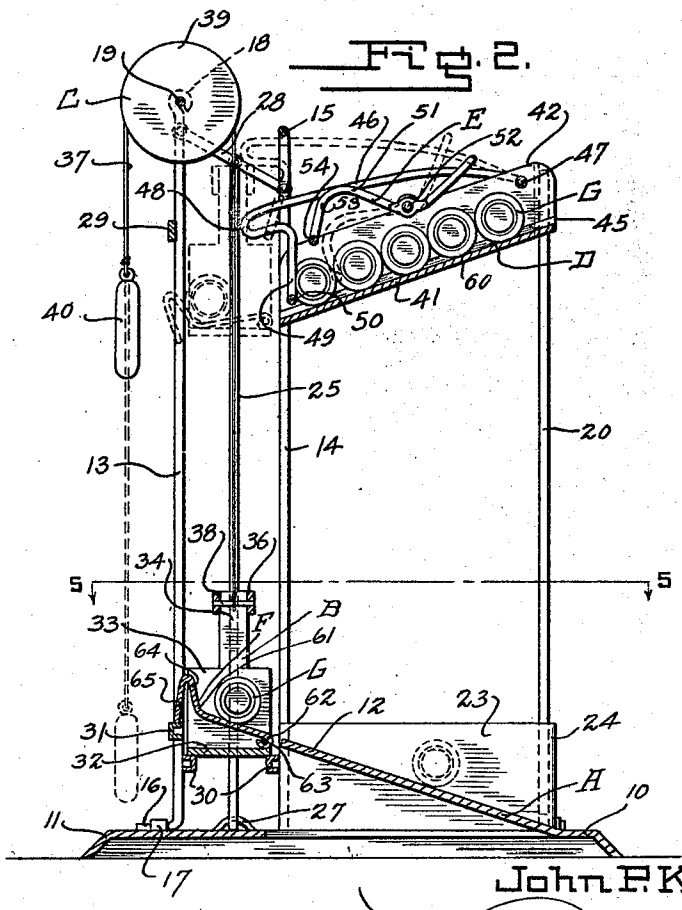


Fig. 2.

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Fig. 3.

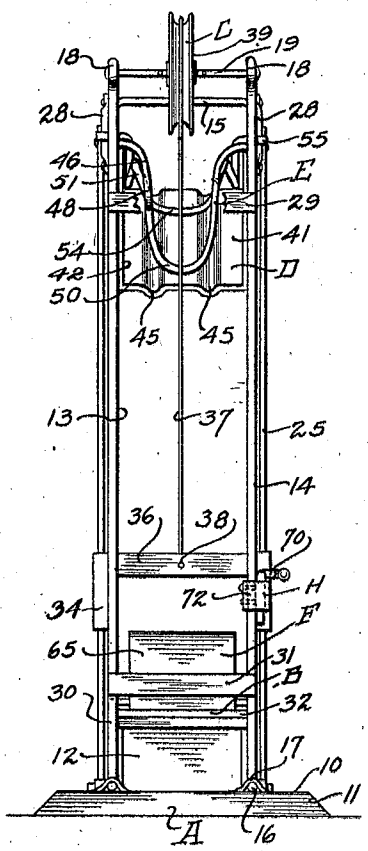


Fig. 4.

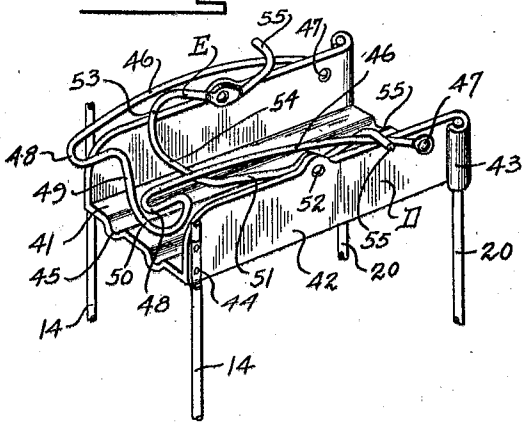


Fig. 5.

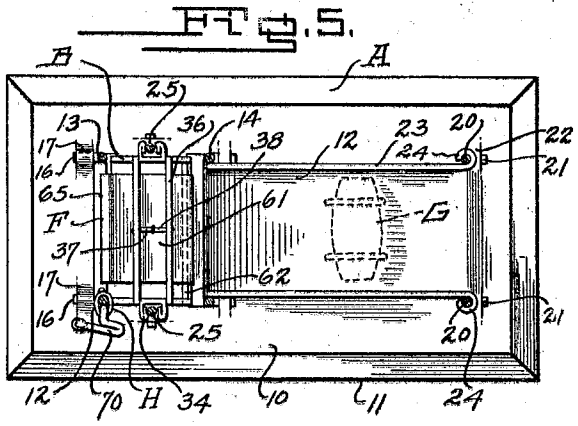
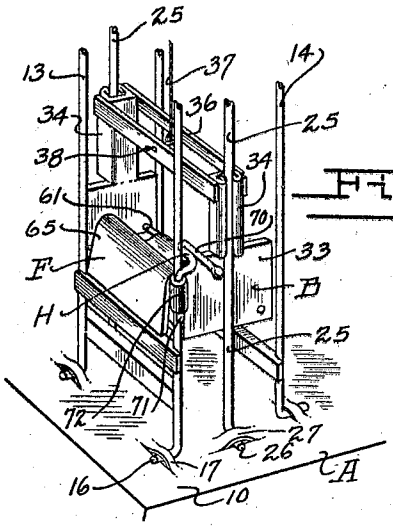


Fig. 6.



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Patented Apr. 24, 1923. 1,452,608

UNITED STATES PATENT OFFICE.

JOHN P. KIRST, OF OHIO, ILLINOIS.

TOY ELEVATOR.

Application filed February 20, 1922. Serial No. 537,957.

To all whom it may concern:

Be it known that I, JOHN P. KIRST, a citizen of the United States, residing at Ohio, in the county of Bureau and State of Illinois, have invented certain new and useful Improvements in Toy Elevators, of which the following is a specification.

This invention relates to toys of the gravity operated type, and the primary object of the present invention is the provision of an improved mechanical toy simulating an elevator embodying novel means operated by the elevator car for periodically feeding weights thereto, for causing the car to automatically lower, means for releasing the weights from the car when the same reaches its lowermost position, and means for automatically returning the car to its uppermost position for releasing another weight from the weight releasing means.

Another object of the invention is the provision of a novel toy embodying a supporting structure, an elevator car slidably mounted in the structure with means for normally sliding and maintaining the car in a raised position, and novel means actuated by the car for releasing a weight when the car is in its uppermost position to cause the car to automatically lower and to overcome the active weight which normally tends to maintain the car in its raised position.

A further object of the invention is the provision of novel means for releasing the weights, the releasing means being so constructed that only one weight at a time is released, thereby insuring the effective operation of the car, the weight releasing means being also so constructed as to move one weight into a releasing position when another weight has just been released.

A further object of the invention is to provide a novel tipping platform carried by the elevator car, which is adapted to be actuated when the car reaches its lowermost position for permitting the weight to roll off of the elevator car.

A further object of the invention is to provide a novel means for forming the weights whereby the same will simulate barrels and whereby the same will be provided with annular guide flanges which are adapted to engage in longitudinal guide tracks formed in the weight feeding means, whereby the weights will always be held in correct position in the weight feeding means thereby preventing the choking of said weight feeding means.

A still further object of the invention is to provide an improved toy elevator of the above character, which is durable in use, one that is simple and easy to manufacture, one which can be placed upon the market at a reasonable cost, and one in which the basic principles thereof can be used in merchandise handling apparatus.

With these and other objects in view, the invention consists in the novel construction, arrangement and formation of parts, as will be hereinafter more specifically described, claimed and illustrated in the accompanying drawings, forming a part of this specification, in which drawings:

Figure 1 is a plan view of the improved toy elevator.

Figure 2 is a vertical longitudinal section through the same.

Figure 3 is a rear edge elevation of the same.

Figure 4 is a detail perspective view of the weight releasing and feeding means.

Figure 5 is a horizontal section through the improved toy elevator taken on the line 5—5 of Figure 2.

Figure 6 is a fragmentary perspective view of the lower portion of the improved elevator illustrating the tipping platform carried by the elevator and the lock carried by the frame for permitting the elevator to be held in a lower non-operative position.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter A indicates the frame of the improved apparatus; B, the elevator car supported by the frame A for vertical reciprocatory movement; C, the means for normally causing the raising of the car; D, the weight feeding means; E, the weight releasing and checking means; and F, the novel means for releasing the weights from the elevator car B when the elevator car is in its lowermost position.

The frame of the improved toy elevator can be constructed in any preferred manner, and in the drawings, the same has been shown as constructed of sheet metal and wire of the desired gauge, but it is to be understood that the same can be constructed of wood or in fact of any material that may be desired or applicable.

The improved frame A, as shown includes a supporting base plate 10, having its marginal edges provided with down struck flanges 11, which cause the base plate 10 to be normally held in a slightly raised position off of the floor or other support upon which the toy may be placed. The base plate 10 at the longitudinal center thereof is provided with an upstruck platform 12, down which the weights are adapted to roll when the same are released from the elevator car B. At one end of the base plate 10 and forwardly of the inclined unloading platform 12 is disposed the elevator shaft 13, which as shown consists of upstanding corner posts 14. As shown, there are four of these corner posts 14 and the same are arranged in pairs, and the innermost pair may be connected at their upper ends by a U-shaped connecting bight portion 15. The lower ends of all of the corner posts 14 are provided with right angularly extending feet 16, which are adapted to be inserted in struck up eyes 17. These eyes 17 can be formed by slitting the base plate 10 and then striking up the metal lying between the slit portions. The outer pair of corner posts 14 can extend beyond the upper ends of the innermost pair of posts 14 and can have their terminals bent to provide eyes 18, which form bearings for the shaft 19, which forms a part of the elevator car raising means C which will be hereinafter more fully described.

The forward end of the base plate 10 in alignment with the front end of the inclined unloading platform 12 can be provided with a pair of posts or standards 20 which can be formed of wire, if so desired, and the lower ends of these posts are also provided with right angularly extending feet 21 which can be inserted through eyes 22 that can be struck up from the base plate 10. The standards 20 and the inner pair of corner posts 14 of the elevator shaft 13 can form a support for the lower unloading platform 12 and for the upper loading platform D which will also be hereinafter more fully described. It can be seen that guide plates 23 are provided for the sides of the unloading lower platform 12 and these side or guard plates can be formed of sheet metal and have their terminals rolled as at 24 around the posts 20 and the innermost pair of posts or standards 14 of the elevator shaft 13. These plates 23 not only act as guards for the unloading lower platform 12, but also as bracing means for the frame A.

Disposed intermediate the front and inner pairs of standards 14 are the guide rails 25 and these guide rails can also be formed of wire of the desired gauge and have their lower terminals bent outwardly at right angles to provide attaching feet 26 which can be inserted in eyes 27 struck out from the base plate 10. The upper ends of the guide rails 25 can be connected with the front and rear posts or standards 14 by means of side pieces 28 as clearly shown in Figure 2 of the drawings. The standards 14 can be braced or linked together at intervals if desired, by cross pieces 29 in order to add rigidity thereto and the standards are connected together at their lower ends by cross bars 30 which form a seat for the elevator car B when the same is in its lowermost position and form means for limiting the downward movement of the car and holds the same in such a position that the weight carried thereby will be released onto the unloading inclined lower platform 12. Directly above the bars 30 is disposed the transversely extending stop 31 which forms means for operating the releasing platform or means F for the weights carried by the elevator car B.

The elevator car B may also be formed of sheet metal if so desired and consists of the lower wall 32 and upstanding side walls 33. The upper ends of the side walls 33 can have guide arms 34 formed thereon for engaging the guide rails 25. It is preferred that the guide arms 34 have their side edges bent back upon themselves to provide bearing faces 35 for engaging the opposite sides of the guide rails or tracks 25, whereby lateral shifting movement of the elevator car B will be prevented. If desired, the upper ends of the arms 34 can be connected by transverse cross bars 36, as clearly shown in Figures 2 and 5 of the drawings.

The automatic raising means C for the elevator car B comprises a cable 37, which may be in the nature of a cord or the like, and the inner end of this cord can be secured to a pin 38, which can be attached to the central portion of the bracing bars 36. The intermediate portion of the cable 37 can be trained about a guide pulley 39 which can be mounted upon the shaft 19 heretobefore mentioned. The outer end of the cable 37 has secured thereto a weight 40, which is of such a size and mass to overcome the weight of the elevator car B. It is obvious that the weight 40 will normally tend to move and hold the elevator car B in a raised position, but that when additional weight is placed upon the car which is heavier than the weight 40, that the car will be automatically lowered due to the force of gravity acting upon the other weight.

The weight feeding means D consists of an inclined platform 41, which may be formed of sheet metal and the side edges of this platform may be bent upwardly to provide side guard flanges 42. This platform, as stated, is secured to the standards 20 and to the innermost pair of corner standards

14 forming a part of the elevator shaft 13. The standards 20 may be secured to the platform 31 in any preferred manner, and if desired, the outer terminals of the side flanges 42 can be coiled to provide eyes 43 for receiving the said standards 20. The innermost pair of standards 14 can be riveted or otherwise secured to the flanges or side walls 42 as at 44. The platform 41 has formed therein intermediate its edges longitudinally extending guide tracks 45, which can be formed therein by bending or corrugating the metal. These guide tracks 45 form an important part of the invention, as the same form means for guiding the weights down the inclined platform into engagement with the elevator car B.

The weight releasing and checking means E includes a pair of arcuate side arms 46, which have their outer ends pivoted as at 47 to the side flanges 42 adjacent to their outer ends. These side arms 46 gradually converge toward their forward ends and are bent inwardly back upon themselves as at 48 to provide ears, which normally lie in the path of the cross bars 36, and it can be seen that upon upward movement of the elevator, the same are adapted to engage the ears and move the arms 46 upwardly. After the arms 46 have been bent to provide the ears 48, the same are continued downwardly to provide a weight engaging portion 49, and this portion can be connected by a cross bar 50 if so desired, and it can be seen that the entire releasing portion can be formed of a single length of wire if so desired. It is obvious that when the arms 46 are raised by the elevator car, that the portion 49 will be lifted from out of the path of the weights contained in the chute or loading platform 41, and thus permit the weights to be fed into the elevator car B.

In order to insure the feeding of only one weight at a time to the elevator car, the checking means is provided which consists of side levers 51, which are pivoted intermediate their ends to side flanges 42 of the unloading platform 41 by pins 52. These levers 51 extend upwardly from the pivot pins 52 and are bent downwardly as at 53 and connected together by a cross bar 54. The bent portions 53 and the cross bar 54 forms a means for retarding the movement of the weights down the inclined platform or chute 41 and prevents the loading of more than one weight at a time upon the elevator car B, as will be hereinafter more fully described. The rear ends of the levers 51 extend upwardly from the pivot pins 52 and are provided with outwardly extending arms 55, which slidably engage the upper curved portion of the side arms 46 adjacent to the outer ends thereof. It is obvious that when the arms 46 are lifted to release a weight, the levers 51 will be swung on their pivots 52 and the bent portions 53 and the cross bar 54 will be moved into the path of the adjacent weight and thus prevent the feeding of more than one weight at a time into the elevator car B.

When the elevator car B returns to its lowermost position by the force of gravity acting upon the weight fed into the same, the arms 46 and the portions 49 and 50 will be returned to their normal positions by their own weight and raise the forward ends of the levers 51, thus moving the same out of the path of the weights and permitting the same to be moved into engagement with the bent portions 49 and the cross bar 50 of the arms 46, thus bringing a new weight in position for release.

The weights, designated by the reference character G can be of any desired size or type, but it is preferred that the same will be constructed to simulate barrels and the same are provided with annular flanges 60 and these flanges are adapted to ride in the guide tracks 45. The flanges 60 of course simulate the appearance of hoops in the ordinary barrels. By providing the flanges 60 and the tracks 45, it will be seen that the barrels or weights will be guided in a straight path down the inclined platform 41.

The means F for releasing a weight G from the elevator car B when the same reaches its lowermost position consists of a tilting platform 61, which also can be formed of sheet metal if so desired. This platform 61 can have its inner edge rolled, as at 62 to provide a hinge barrel, and a suitable pin 63 can be inserted through the barrel and secured to the side walls 33 of the elevator car B. The rear edge of the tilting platform 61 may be bent upwardly as at 64 to provide a rear wall, and this wall may be bent back upon itself to provide an actuating lug or flange 65. This flange or lug 65 is in the path of the cross stop bar 31, and it is obvious that when the car B reaches its lowermost position, the flange 65 will be raised by the stop 31, thus throwing the platform 61 in a raised tilted position which will cause the weight G in the car to roll off of the elevator car B onto the unloading inclined platform 12. As soon as the weight is released from the car, the same will be automatically raised by the weight 40 and another weight carried by the inclined platform 41 will be released in the manner heretobefore set forth.

From the foregoing description, it can be seen that an improved toy of simple and durable construction has been provided, which will be amusing to both young and old, and in which the operation thereof is entirely automatic.

When it is desired to hold the elevator car B against upward movement and the toy

against operation, the lock member H can be actuated. This lock member H includes a lever 70 disposed in a horizontal plane and which is adapted to be moved into the path of the elevator car B for holding the same against upward movement. The lever 70 is provided with a vertical pintle 71, which can be mounted in a suitable hinged barrel 72 which can be attached in any preferred manner to one of the corner standards 14. The lever 70 can be provided with an operating knob if so desired.

While I have described the improved device as a toy, it is to be understood that the principles thereof can be readily incorporated in a merchandise handling apparatus and it can be seen that by use of the improved device, material can be readily moved from one floor to another in an expeditious and simple manner.

Changes in details may be made without departing from the spirit or scope of this invention; but,

I claim:

1. In an elevator, an elevator shaft, an elevator car slidably mounted in the shaft, a cable connected to the car and trained about the pulley, a weight connected to the cable for normally holding the car in a raised position, a releasing means including a pair of arcuate arms, and a downwardly extending U-shaped member normally disposed in the path of the weights, the forward terminals of the arcuate arms being disposed in the path of the elevator car, means pivotally securing the rear ends of the arms to the loading platform, a weight checking means including a pair of levers pivotally secured intermediate their ends to the loading platform, forwardly and downwardly extending members formed on the forward ends of the lever for engaging one of the weights in rear of the weight engaged by the releasing member, and outwardly extending arms formed on the rear ends of the levers for engaging the arcuate portions of the arms of the releasing member.

2. An elevator comprising a shaft, an elevator car slidably mounted in the shaft, a pulley, a cable trained about the pulley having one end connected to the elevator car, a weight secured to the other end of the cable for normally holding the elevator car in a raised position, an inclined loading platform including a lower wall and side guard flanges, weights of predetermined mass disposed on the loading platform, weight releasing means including a pair of inwardly extending arcuate arms, the forward ends of the arms extending into the elevator shaft, a cross plate carried by the elevator car for engaging the inner ends of the arms, a depending U-shaped portion formed on the arms arranged to normally extend in the path of the weights for preventing movement thereof, means pivotally securing the outer ends of the arms to the side walls of the loading platform, a weight checking member including side levers, means pivotally securing the side levers to the side walls intermediate their ends, a downwardly disposed U-shaped member formed on the inner ends of the levers for movement into the path of a weight carried by the loading platform in rear of the weight engaged by the released member, outwardly extending arms formed on the outer ends of the levers for slidably engaging the arcuate portion of the arms of the releasing member, a tilting platform carried by the elevator car for receiving the weights from the loading platform, said tilting platform including a lower wall, means pivotally securing the inner end of the lower wall to the elevator car, an upwardly and downwardly bent portion formed on the rear edge of the platform, and means carried by the elevator shaft disposed in the path of the downwardly bent portion of the tilting platform, causing the tilting of the platform when the elevator car reaches its lowermost position.

3. An elevator comprising a base plate formed of sheet metal, an elevator shaft formed of wire rods having their lower terminals bent outwardly at right angles, struck out eyes formed in the base plate for receiving the lower ends of the rod, guard and guide rails disposed in the shaft having one of their lower ends bent at right angles, eyes upstruck from the base plate for receiving said bent ends, a forward pair of wire standards connected to the base plate, and a sheet metal unloading platform secured to the last mentioned standards and to the elevator shaft, an inclined unloading platform struck up from the base plate, a sheet metal elevator car mounted in the elevator shaft, guide flanges formed on the elevator car for slidably engaging the guard rails, a shaft carried by the elevator shaft, a cable trained about the shaft, means connecting the cable to the car, a weight connected to the cable for normally raising the car, weights carried by the loading platform, means actuating the elevator car for releasing the weights, means for releasing the weights in the elevator car when the same reaches its lowermost position so that the same will be moved onto the unloading platform.

4. In an elevator, an elevator shaft, an inclined loading platform disposed at the upper end of the elevator shaft, an elevator car slidably mounted in the shaft for vertical movement, means for normally holding the elevator car in a raised position in the shaft, a plurality of weights on said loading platform, a releasing member for the weights pivotally carried by the loading platform, means actuated by the elevator car

for operating said releasing means whereby a weight is permitted to roll into the elevator car, a weight checking means pivotally carried by the loading platform for engaging the weights, and means operatively connecting the weight checking means to the weight releasing means whereby the former is swung on its pivot to check all of the weights but that nearest the shaft when the weight releasing means is swung on its pivot to release the weight nearest the shaft.

5. In an elevator, a frame including an elevator shaft, an inclined loading platform having its delivery end at the upper portion of the shaft, said platform provided with longitudinally extending parallel grooves, weights simulating barrels mounted on the platform for sliding movement, said weights provided with annular ribs formed on their periphery for engaging in said grooves, an elevator car slidably mounted in the elevator shaft, and means actuated by the elevator car for permitting one weight at a time to be released from the unloading platform and to roll into said car.

6. In a toy elevator, the combination of an elevator shaft, a plurality of barrel shaped weights, means for delivering said weights, one at a time into the shaft at the upper end portion thereof, a car guided in its movement up and down in said shaft, said car including a lower wall and upstanding side walls relatively wider than the diameter of said weights, and a weight releasing means for the car when it reaches the lower portion of the shaft, including a platform extending between the said upstanding walls of the car, said platform pivotally connected at one margin to the lower wall of the car, and having its upper surface shaped to receive the weight between said upstanding walls; and a rigid member carried by the elevator shaft adapted to engage the car carried platform when the car approaches its lowermost position to swing the car carried platform about its pivot, causing the weight to roll from between the upstanding walls of the car.

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