

June 14, 1932.

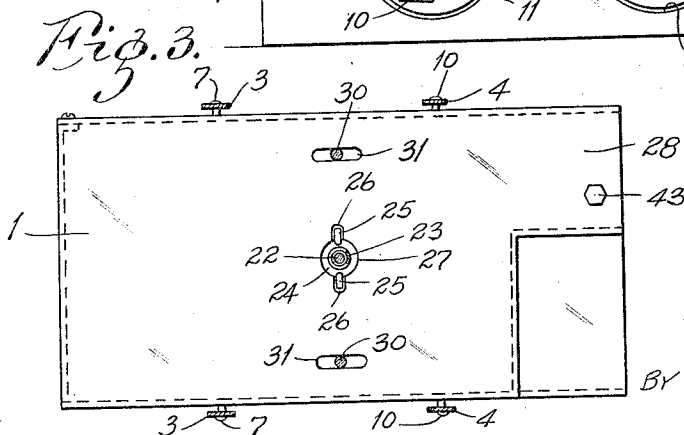
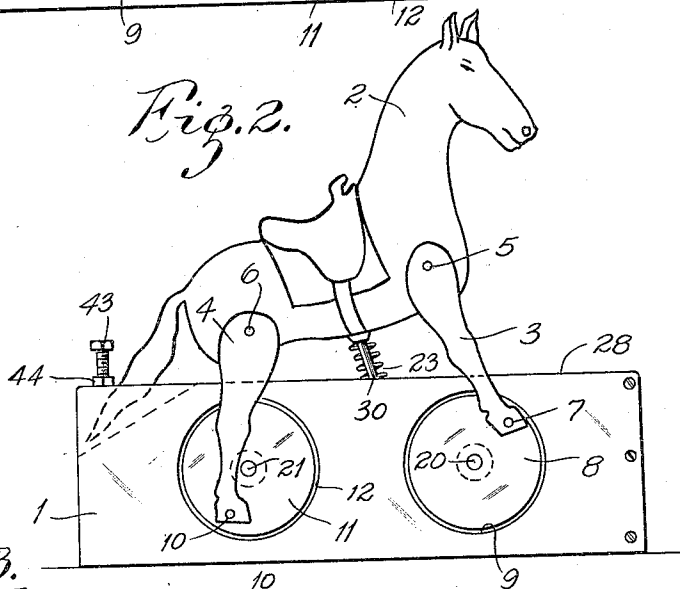
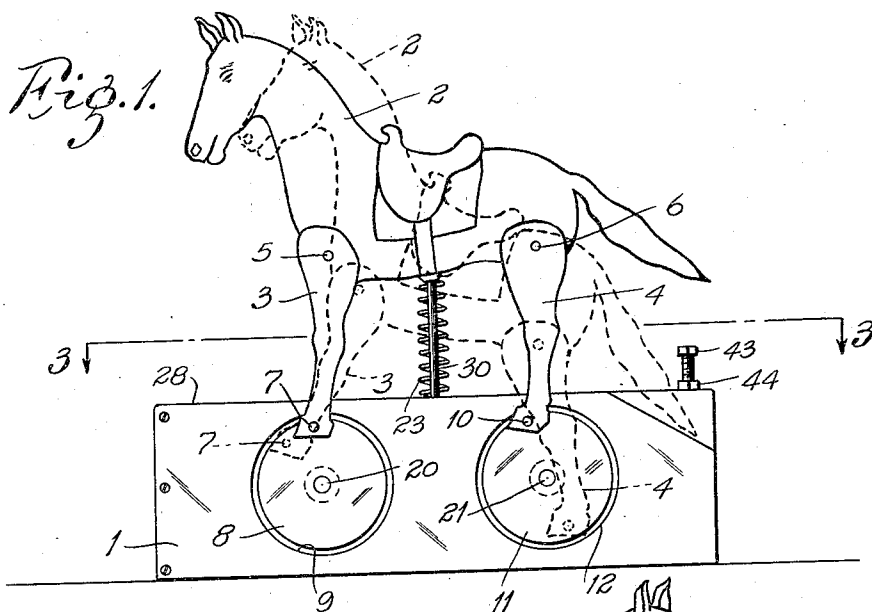
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1,863,012

MECHANICAL HOBBYHORSE

Filed Feb. 21, 1931

2 Sheets-Sheet 1



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Fig. 4.

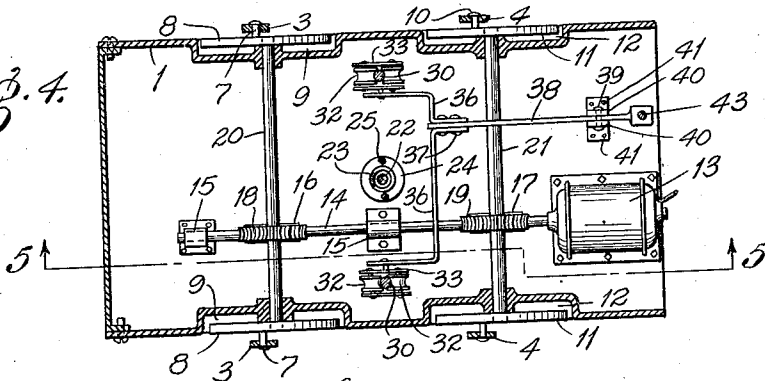


Fig. 5.

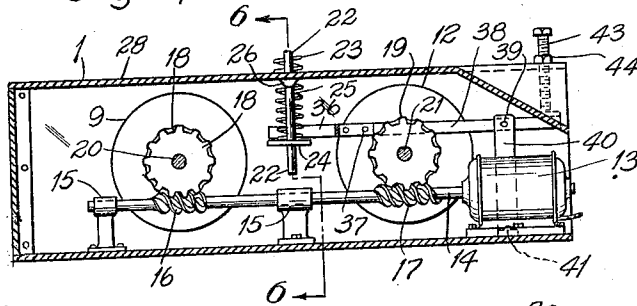


Fig. 6.

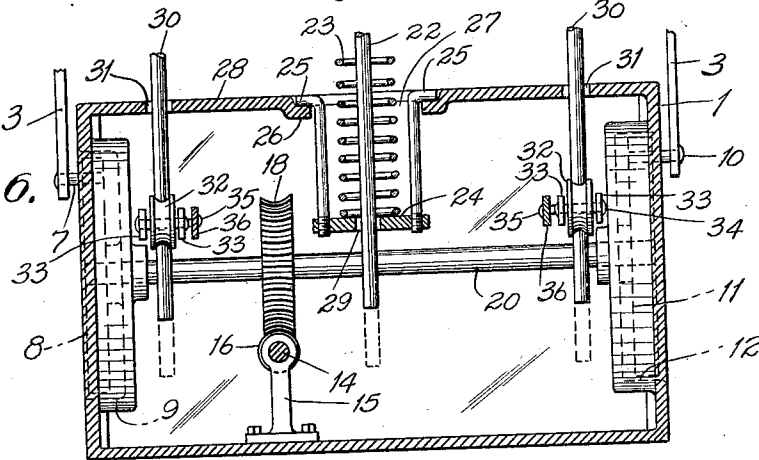
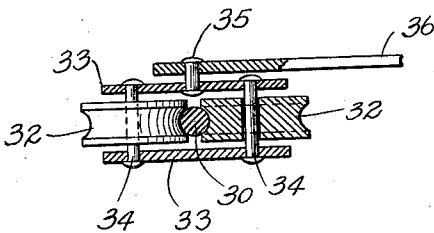


Fig. 7.



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MECHANICAL HOBBYHORSE

Application filed February 21, 1931. Serial No. 517,472.

The general object of this invention is to provide a mechanically operated hobby-horse which, when placed in operation, will in a measure simulate the motions of a horse in going through its various gaits, such as loping, galloping and the like.

With the above object in view, the invention consists, essentially, in pivotally mounting the front and hind legs of the hobby-horse on two sets of crank members, in the form of disks, which are caused to rotate at differential rates of speed, the legs being also pivotally mounted on the body of the horse and means being provided for maintaining the body of the horse in the proper riding position, whereby, as the disks are rotated, the front and rear of the body of the hobby-horse will be alternately raised and lowered, such motions varying in degree and character according as one set of disks, driven at a higher rate of speed, advances the points of pivotal connection of the legs therewith relative to the points of connection of the other legs with the other set of disks, both sets of disks being simultaneously rotated from the same source of power.

When the two points of pivotal connection of the legs with the respective sets of disks are positioned in parallel vertical planes, i. e., when said points are in the extreme upper position, or the extreme lower position, the body of the hobby-horse will have a horizontal position, and momentarily the motion of the body will be in an up and down direction. As the pivots of the faster driven disks advance in position relative to those of the slower driven disks, the body of the hobby-horse will be caused to assume an inclined position, which increases in degree of angularity to the maximum inclination, which is governed, primarily, by the diameters of the disks to which the legs are pivoted; and this inclined position of the body of the hobby-horse may occur either with the head down and the tail up, or vice versa. Any given position of the body of the hobby-horse is maintained only momentarily, as the relative positions of the pivot points of the front and hind legs are constantly changing, which, of course, causes a constant change in

the character of motion of the said body. As the speed of rotation of the drive is fixed, however, and the differential between the speeds of the two sets of driven disks is a known quantity, it follows that the motions of the body of the hobby-horse will occur in recurring cycles; that is to say, from an up and down movement with the body in a horizontal position through the various inclinations of said body, with the head assuming the lower position, back to the horizontal position, and then through the various inclinations of the body with the head in an elevated position back to the horizontal position of the body.

By reason of this constant variation in the motions of the hobby-horse, it affords not only pleasure and amusement to the person riding the hobby-horse, but it also is valuable in exercising the body, for the various motions, or gaits, of the hobby-horse not only require a certain amount of skill and dexterity on the part of the rider to maintain his seat, but such variable movements bring into play a greater number of muscles, and require the expenditure of energy exerted in more different positions than could possibly obtain were the movement of the hobby-horse uniform through the cycles of operation.

It is an object also of the invention to provide means for regulating the intensity of the movements of the hobby-horse by limiting to a desired extent the degree of inclination which the body of the hobby-horse may assume in the various cycles of movement.

With the latter object in view, I provide rods depending from the body of the hobby-horse, which rods extend through swiveled guides, said guides being mounted on an adjustable lever-arm, whereby they may be raised or lowered on said rods to change the pivot points thereof, so that the degree of inclination of the body of the hobby-horse occurring in operation, may be reduced from a maximum, regulated by the size of the driving disks, through varying degrees to a minimum, regulated by the height to which the guides are adjusted on said rods.

Finally, there are various novel features entering into the construction and operation

of my improved hobby-horse, which will be clearly described in the course of the following specification.

In the accompanying drawings—

5 Fig. 1 is a view in side elevation of a mechanical hobby-horse constructed according to my invention, showing in full lines a horizontal position of the body of the horse, and in dotted lines an extreme inclined position;

10 Fig. 2 is a similar view, showing the position of the body of the hobby-horse as shown by dotted lines in Fig. 1, but viewed from the opposite side to that shown in Fig. 1;

15 Fig. 3 is a horizontal sectional view showing in plan the base on which the hobby-horse is mounted, the section being taken on the line of 3—3 of Fig. 1;

Fig. 4 is a horizontal sectional view through the base shown in Fig. 3;

20 Fig. 5 is a longitudinal sectional view taken on the line 5—5 in Fig. 4;

Fig. 6 is a cross sectional view, enlarged, taken on the line 6—6 of Fig. 5; and

25 Fig. 7 is a detail view, showing, in elevation and section, respectively, one of two similar sets of adjustable guide-rollers, between which rods depending from the body of the hobby-horse work.

Referring now to the drawings, the numeral 1 indicates a base supporting the hobby-horse 2 and enclosing the operating mechanism therefor. The hobby-horse comprises a body, of any desirable size, that is to say, of a size adapted for adults or of a smaller size adapted for children, and front 35 legs 3 and hind legs 4 which are pivoted, respectively, at the front and rear and on opposite sides of the body 2, as indicated for the front legs at 5, and for the hind legs at 6. 40 At their lower extremities, the front legs 3 are pivotally connected at 7 to cranks, preferably in the form of disks 8 located, respectively, on opposite sides of the rectangular base 1 and housed in circular recesses 9 in the sides of said base. In a similar manner, 45 the hind legs 4 are pivotally connected at 10 to disks 11 housed in recesses 12. The two pairs of disks 8 and 11 are adapted to be rotated, respectively, at constant but different 50 rates of speed for the purpose of imparting a variety of movements to the body 2 of the horse, and to this end I preferably employ the construction now to be described, although other mechanism for imparting different rates of speed to the pairs of disks 8 55 and 11 could be employed within the spirit of my invention.

Referring more particularly to Figs. 4, 5, and 6, the numeral 13 indicates an electric 60 motor, having a driving shaft 14 supported in bearings 15 mounted on the bottom of the base 1, and on which shaft are provided two spaced worms, 16 and 17. The worm 16 is in mesh with a worm gear 18 having, say, 65 fifteen teeth, and the worm 17 is in mesh

with a worm gear 19 having, say, twelve teeth. The worm gear 18 is fast on a cross-shaft 20, on opposite ends of which the crank disks 8 are rigidly secured. The worm gear 19 is fast on a cross-shaft 21 on opposite ends 70 of which the disks 11 are rigidly secured.

In order to support the body 2 of the hobby-horse in a relatively upright position, I provide the following mechanism:

Secured centrally on the underside of the 75 body 2 is the upper end of a rod 22 which is surrounded by a coil spring 23, the upper end of which bears against the body and the lower end of which rests on the bottom of a cup 24, Fig. 6, which is supported by rocking 80 bearings 25 at its upper end on a circular flange 26 surrounding an enlarged opening 27 formed in the top 28 of the base 1. The bottom of cup 24 is provided with an aperture 29 through which the rod 22 extends. 85

From the above description it will be seen that the body 2 of the hobby-horse is yieldingly supported on and by the coil spring 23, and as the spring exerts constant upward 90 pressure on said body, it tends to prevent, in conjunction with rod 22, the hobby-horse from falling backward or forward on to the base 1, which would otherwise occur, owing to the fact that the legs of the horse are pivotally mounted at both their upper and lower 95 ends. At the same time the cup 24 is free to rock on bearings 25 to permit of the spring 23 and rod 22 assuming angular positions in the rocking movement of the hobby-horse, as indicated in Fig. 2. 100

From the description as thus far given, it will be seen that as the disks 8 and 11 are rotated, the front and rear of the body 2 of the hobby-horse will be alternately raised and 105 lowered from a momentary horizontal position, such as shown in full lines in Fig. 1, when the pivots 7 and 10 are simultaneously in the extreme upper position; or of course, when such pivots are in the extreme lower position. It will further be seen that as the 110 disks 11 are rotated at a higher rate of speed than the disks 8, owing to the fact that the worm gear 19 driving the shaft 21, on which said disks 11 are mounted, has a less number 115 of teeth than the worm gear 16, the body 2 will be gradually changed from any given position it may occupy, from the horizontal position shown in Fig. 1 to the extreme inclined position shown in Fig. 2, in which the 120 head of the hobby-horse occupies the higher elevation; or to an extreme inclined position in which the rear of the hobby-horse will occupy the higher elevation. The result is that the motion of the body 2 is not uniform, 125 but during any cycle of movement of the disks 8 and 11 there will be a gradual change in either the elevation of the head or tail of the horse, so that the resultant movement very closely simulates the various gaits of an actu- 130

al horse in movement, such as in walking, trotting, pacing, galloping, etc.

The invention also includes the provision of adjustable means for modifying the degrees of angularity through which the body 2 may pass in its rocking movement.

With the latter object in view I secure at their upper ends on opposite sides of the body 2, two rods 30, which pass through aperture 31 formed in the top 28 of the base near opposite sides thereof, Fig. 6, and which pass between and in engagement with two-grooved friction rollers 32, Fig. 7, which are rotatably mounted between two parallel plates 33. The plates 33, being united by the axles 34 of the two rollers, form a cage, the construction being the same at each side of the base for each of the rods 30. Each of these cages is swiveled at 35 Fig. 7 to a bent arm 36, which arms are united at their outer ends as indicated at 37, Fig. 4 to the inner end of the lever-arm 38 which is pivotally mounted near its outer end, as indicated at 39 in Figs. 4 and 5, between the upper ends of two bracket arms 40, which are secured at their lower ends on the bottom of the base, as indicated by 41 in Fig. 4. The rods 30 extend upward through slots 42 in the top 28 of the base and are thus free to assume different angular positions occasioned by the movement of the body 2. The numeral 43, Figs. 1, 2, and 5, indicates an adjusting screw passing through the top of the base and at its lower end bearing against the upper outer end of the lever arm 38. With the adjustment such that the body 2 of the hobby-horse will have the widest range of angular movement, by unscrewing the adjusting screw 43 so as to permit the cages carrying rollers 32 to be lowered in position on rods 30, the range of movement of the pivots 5 and 6 will be shortened, and the motion of the hobby-horse will be more or less gentle, according to the extent to which the cages are lowered. On the other hand, by screwing down the adjusting screw 43 to cause the cages to assume a higher position on rods 30, the severity of movement may be increased to any desired extent up to the maximum. A lock nut 44 is used to secure screw 43 in any adjusted position.

The rods 30, in addition to their function of controlling the angular positions of the hobby-horse, also cooperate with spring 23 and rod 22 in maintaining the same in riding position.

While I have illustrated and described the preferred embodiment of my invention, I wish it understood that my invention is susceptible of other embodiments without departing from the spirit thereof.

I claim:

1. A mechanically operated hobby-horse comprising, in combination, a base having on opposite sides thereof two pairs of rotatable crank-members, a horse body having front

and hind legs pivotally connected at their upper ends to the body and at their lower ends to said crank-members, means for yieldingly supporting the body of the horse, and means for simultaneously rotating said crank-members at different rates of speed.

2. A mechanically operated hobby-horse comprising, in combination, a base having a pair of cross shafts rotatably mounted therein, each of which is provided with a crank at each end, a horse body having front and hind legs pivotally secured at their upper ends thereto and at their lower ends to said cranks, means for yieldingly supporting said body and means for rotating said respective sets of cranks continuously at different rates of speed.

3. A mechanically operated hobby-horse comprising, in combination, a base having a pair of cross-shafts rotatably mounted herein, a crank-disk secured at the outer end of each of said cross-shafts, a pair of worm gears having different numbers of teeth fixedly secured on the respective cross-shafts, a motor, a shaft driven by said motor and having two worms engaging the respective worm gears, whereby to simultaneously drive the same at different rates of speed, a horse body having front and hind legs pivotally connected to said body at their upper ends and to said crank-disks at their lower ends, and means for yieldingly supporting said body on said base.

4. A mechanically operated hobby-horse comprising, in combination, a pair of cross-shafts rotatably mounted therein and each of which is provided with a crank-member at each end, a horse body having front and rear legs pivotally connected at their upper ends to said body and at their lower ends to the respective crank-members, a rod secured at its upper end to the underside of said body and passing downward through said base, a coil spring surrounding said rod and interposed between the base and said body, and means for rotating said crank-disks simultaneously at different rates of speed.

5. A mechanically operated hobby-horse comprising, in combination, a base having on opposite sides thereof two pairs of rotatable crank-members, a horse body having front and hind legs pivotally connected at their upper ends to the body and at their lower ends to the respective crank-members, means for yieldingly supporting the body of the horse on said base, means for controlling the degrees of angularity assumed by the horse in operation, and means for simultaneously rotating the respective pairs of crank-members at different rates of speed.

6. A mechanically operated hobby-horse comprising, in combination, a base having on opposite sides thereof two pairs of rotatable crank-members, a horse body having front and hind legs pivotally connected at their

upper ends to the body and at their lower ends to the respective pairs of crank-members, means for yieldingly supporting the body of the horse on the base, means for simultaneously rotating said pairs of crank-members at different rates of speed, and adjustable means for varying the degrees of angularity assumed by said body in the movement thereof occasioned by the rotation of said crank members.

7. A mechanically operated hobby-horse comprising, in combination, a base, a hobby-horse having a rod secured on its underside and projecting through said base, a coil spring surrounding said rod and interposed between the hobby-horse and the base to yieldingly support the former, front and hind legs pivotally mounted at their upper ends on the body of the hobby-horse, crank-members mounted on said base and pivotally connected in pairs to the lower ends of said legs, and means for simultaneously rotating the two pairs of crank-members at different rates of speed.

8. A mechanically operated hobby-horse comprising, in combination, a base, a cup having a rocking support on said base, a hobby-horse having a depending rod secured centrally of its underside and projecting through the bottom of said cup, a coil spring surrounding said rod and bearing at its upper end against the underside of the hobby-horse and having its lower end housed in said cup, whereby, to yieldingly support the hobby-horse, front and hind legs pivotally mounted at their upper ends on the body of the hobby-horse, crank-members mounted on said base and pivotally connected in pairs to the lower ends of said legs, and means for simultaneously rotating the two pairs of crank-members at different rates of speed.

9. A mechanically operated hobby-horse comprising, in combination, a base, a hobby-horse yieldingly mounted thereon, front and hind legs pivotally connected at their upper ends to the body of said horse, rotatable crank-members mounted on said base and pivotally connected, respectively, to the lower ends of the front and rear legs, means for simultaneously rotating the two sets of crank-members at different rates of speed, rods connected to opposite sides of the body of the hobby-horse and slidably mounted in said base, a movable guide for each of said rods, and means for simultaneously raising or lowering said guides to vary the degree of the angular positions assumed by the body of the horse in the movement thereof occasioned by the rotation of said crank-members.

10. A mechanically operated hobby-horse comprising, in combination, a base, a hobby-horse yieldingly supported thereon having front and hind legs and capable of assuming angular positions, and differential mechanism for simultaneously operating upon the front

and hind legs of the hobby-horse to alternately raise and lower the same to cause the body of the hobby-horse to assume various angular positions in recurring cycles.

In testimony whereof, I have hereunto set my hand.

JAMES OTTO HAHS.

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