Aug. 14, 1951 B. SCHROUGHAM 2,564,547

POWER DRIVEN SWING

Filed Nov. 21, 1946

2 Sheets-Sheet 1

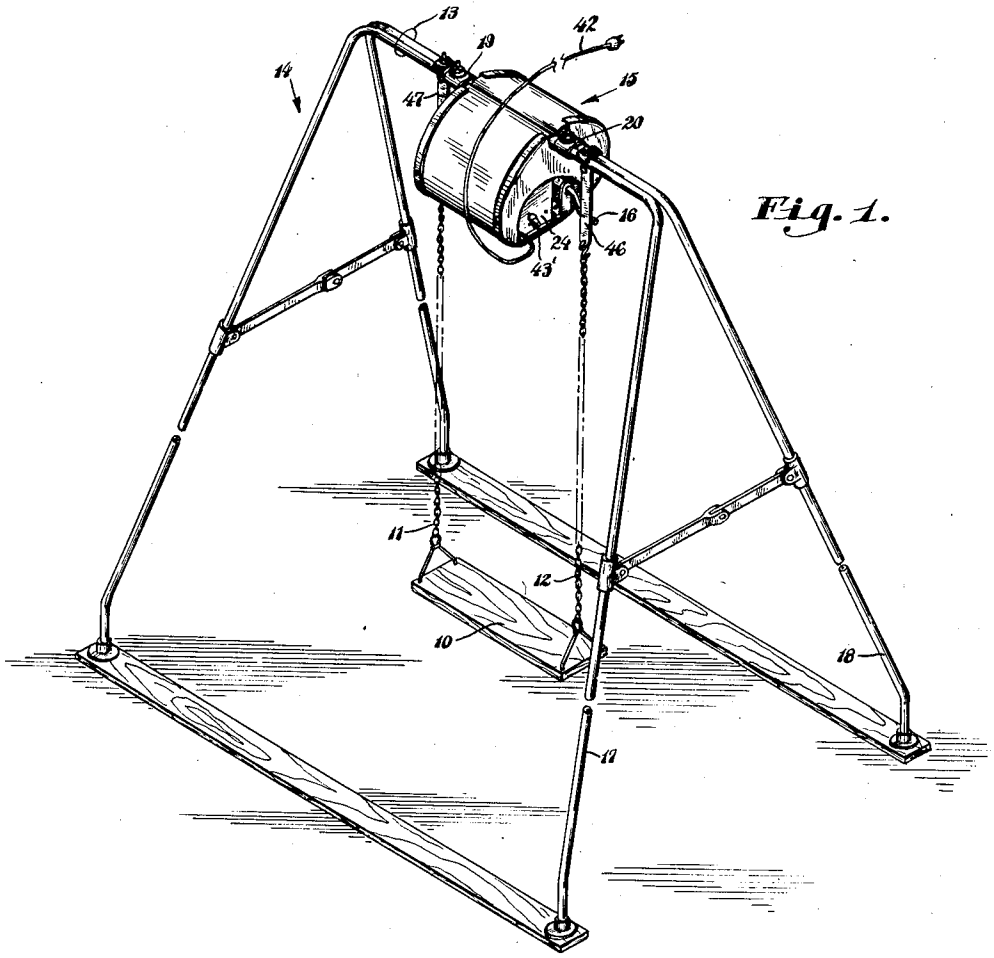


Fig. 1.

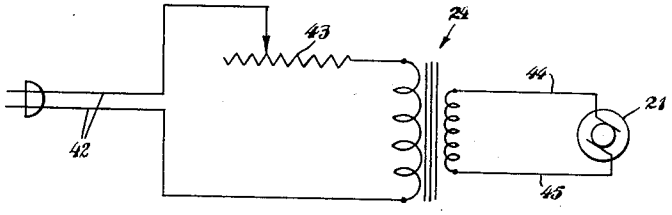


Fig. 3.

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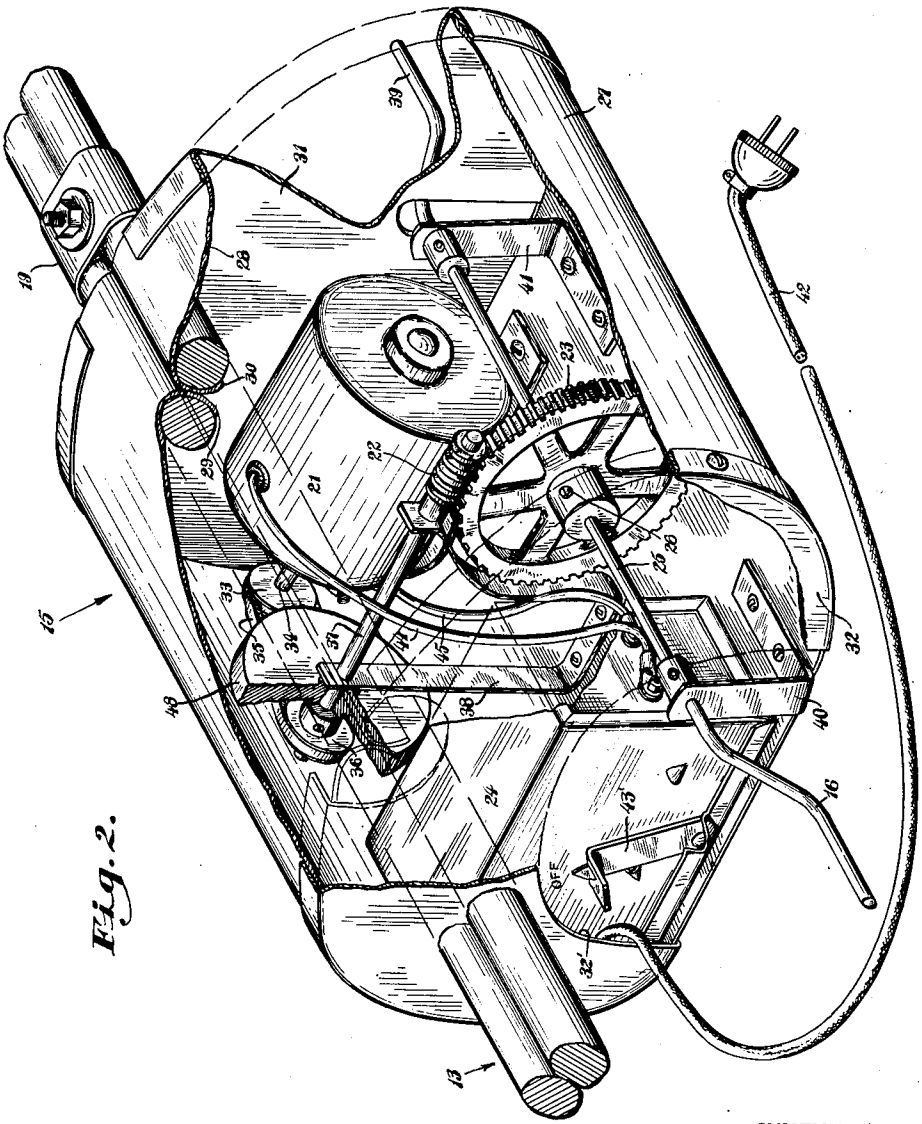


Fig. 2.

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POWER-DRIVEN SWING

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8 Claims. (Cl. 155—59)

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The present invention relates to a device for operating a swing in which a prime mover drives a crankshaft which is so associated with the swing as to apply force to the swing in one direction only.

It is the primary object of the present invention to impart an oscillating motion to a swing by means of a rotary driven shaft having oppositely extending crank arms which engage one side only of the strands supporting the swing.

It is a further object of the present invention to provide for an A-type swing standard comprising two separate standard elements having their cross-bars clamped together by means of clamps and a housing containing the aforementioned swing-actuating device. The swing support strands are connected to the cross-bars adjacent said swing-actuating device in such a manner as to allow for the engagement of the crank arms extending from said device with these strands.

It is a still further object of the present invention to provide an electric motor driven worm and wheel assembly to which is connected a crankshaft; the purpose of this installation being to sufficiently reduce the speed of the electric motor for its effective utilization by said crankshaft. The above-mentioned mechanism is contained in a housing comprising a strip of sheet metal bent to a substantially oval form, the adjacent ends of this strip being hooked to engage over the two bar members which form the cross bar of the swing standard, together with end closure plates for holding said strip in oval form. The crankshaft protrudes through these closure plates with the axis defined by said shaft substantially parallel to the defined axis of said cross-bar.

To the accomplishment of the above and related objects, my invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that change may be made in the specific construction illustrated and described, so long as the scope of the appended claims is not violated.

Fig. 1 is a perspective illustration of an embodiment of my invention;

Fig. 2 is a similar illustration presenting a cutaway view of the prime mover and its associated worm and wheel assembly, and the crankshaft; and

Fig. 3 is a schematic wiring diagram.

Referring more particularly to Fig. 1 of the drawings, it will be seen that I have illustrated a

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swing 10 supported on strands 11 and 12 which are secured to the cross-bar 13 of the standard indicated generally by the reference numeral 14. The swing-actuating unit 15 is shown in its operating position with the crank arm 16 about to engage the strand 12. The standard 14 comprises two frame members, generally of inverted U-shape, 17 and 18 with the cross-bars thereof clamped together by clamps 19 and 20 thus forming the cross-bar 13. The method of securing unit 15 to the cross-bar 13 will be explained more fully later.

The driving assembly, illustrated in Fig. 2, includes an electric motor 21, a gear reduction system preferably including a worm 22 and a wheel 23, a variable transformer 24, and a crankshaft 25 which is secured to wheel 23 by the set screw means indicated by reference numeral 26. These elements are housed in a container 27 comprising a strip of sheet metal 28 bent to a substantially oval form, the adjacent ends of this strip being formed to provide hooks 29 and 30 to engage the cross-bars of the frame members 17 and 18 respectively. Clamps 19 and 20, of which only clamp 19 is shown in this figure, are of conventional design, and serve the joint purpose of holding the frame members 17 and 18 together to form the cross-bar 13 and of firmly securing the container 27 to the swing standard. End closure plates 31 and 32 are provided with perimetral flanges engaging the external surface of strip 28 at its opposite edges and preferably secured thereto by screws or other suitable fastening means, closure plate 32 being cut away, as shown at 32', for a purpose which will later become apparent.

Upon energization of the electric motor 21 through the speed regulating transformer 24, pulley 33, which is secured to shaft 34 of said motor, is caused to rotate. Pulley belt 35 transferring this rotary motion to pulley 36 and shaft 37, which is suitably supported on a bracket 38, causes the shaft 37 and worm 22 to rotate. Another shaft 25 having oppositely extending crank arms 16 and 39, suitably supported on support brackets 40 and 41, will then rotate by virtue of the engagement of worm 22 with the wheel 23. Needless to say, the speed of rotation of these crank arms will depend upon the driving ratio between the worm and wheel as well as the particular adjustment on the speed regulating transformer 24.

A conventional type power cord 42 is the means used to feed electric energy to the primary circuit of the speed regulating transformer 24 through a variable rheostat 43 controlled by

a manually manipulable lever 43' accessible through the cut-away portion 32' of the end plate 32. The secondary circuit of this transformer 24 is wired to the energizing winding of the electric motor 21 by wires 44 and 45. It is thus seen that by adjusting the rheostat 43 the primary exciting current will correspondingly change, thus changing the potential impressed upon the energizing winding of the electric motor 21 to vary the speed of rotation of the motor shaft 34.

Referring again to Fig. 1, it will be seen that when the electric motor 21 is energized, the crank arms 16 and 39 will rotate and thus engage the straps 46 and 47 on one side only, so that the strands need not follow the crank arms through one-half of each revolution.

I prefer to mount on the shaft 37 a flywheel 48, which will tend to smooth out the effect upon the motor 21 of variations in the resistance to rotation of the cranked shaft 25 produced by the swing-supporting straps.

I claim as my invention:

1. In an apparatus of the character described, a swing standard, a swing suspended thereon, an electric motor driven means supported on said standard for imparting impulses of force to said swing in one direction only, a variable resistance connected in the energizing circuit for said motor, a crank arm, and a worm-and-wheel assembly operatively connecting said motor to drive said crank arm.

2. A swing-actuating device comprising an electric motor, a variable resistance connected in the energizing circuit of said motor, a worm-and-wheel assembly, a crank arm, a shaft carrying said crank arm, said assembly connecting said motor to said shaft to drive said shaft, and a metal housing comprising a strip of sheet metal bent to a substantially oval form, the adjacent ends of said strip being hooked to engage over horizontal frame members of a swing standard, end enclosure plates secured to said housing for holding said housing in its oval form, said shaft protruding through said plates in such a manner that said crank arm will be located outside of said housing, said housing containing the swing-actuating mechanism.

3. In an apparatus of the character described, a swing standard, a swing including two flexible depending elements suspended thereon, an electric motor driven means supported on said standard for imparting impulses of force to said swing in one direction only, said means comprising an electric motor, a worm-and-wheel assembly, two cranks arms respectively arranged for operative engagement with said depending elements, a shaft carrying said crank arms, said motor causing said crank arms to rotate by means of said assembly which is operatively connected to said shaft, and a speed regulating rheostat connected in the energizing circuit of said motor.

4. In an apparatus of the character described, a swing standard comprising two U-shaped frame members, said members being joined together at their upper horizontal cross bars with the axes defined by said bars being substantially parallel to form a single cross bar for said standard, a housing, a swing-actuating mechanism, said housing comprising a strip of sheet metal bent to a substantially oval form with its adjacent ends being formed to provide hooks, said hooks engaging over said members respectively and thus being secured to said single cross bar, and a swing, said swing-actuating mechanism being contained within said housing and operatively engaging said swing on one side only.

5. Apparatus of the character described, comprising a flexible strip bent to bring its opposite ends substantially into juxtaposition, an electric motor supported on said strip intermediate the ends thereof, means supported on said strip providing bearings adjacent opposite edges of said strip, a horizontal shaft journalled in said bearings and projecting beyond said strip edges, crank means carried at the projecting ends of said shaft, a worm wheel fixed to said shaft, means mounted on said strip adjacent said motor and said first-named means and providing a bearing support, a second shaft journalled in said bearing support, a worm carried on said second shaft and operatively engaging said worm wheel, means connecting said motor and said second shaft to drive said second shaft, closure plates engaging the opposite edges of said strip to hold the ends of said strip in substantial juxtaposition, and means for controlling the speed of operation of said motor.

6. A housing for a swing actuating device comprising a strip of sheet metal bent to a substantially oval form, the adjacent ends of said strip being hooked to engage over frame members of a swing standard, end enclosure plates secured to said housing for holding said housing in its oval form, and means supported on said strip providing axially aligned bearings adjacent opposite edges of said strip to support a shaft journalled in said bearings.

7. A swing-actuating device comprising motor means, means for varying the speed of said motor means, a crank shaft, rotary motion transfer means connecting said motor means with said crank shaft, and a housing for containing said motor means and its associated mechanism comprising a strip of sheet material bent to a substantially oval form, means connecting the adjacent ends of said strip to horizontal frame members of a swing standard, and means secured to said strip for holding said housing in its oval form, said shaft projecting beyond the edges of said strip.

8. A swing-actuating device comprising a crank shaft, a housing, bearing means mounted within said housing to support said shaft, a worm wheel carried on said shaft, a second shaft, a worm carried on said second shaft engaging said wheel, and means carried on said second shaft adapted to receive motive power, said housing comprising a strip of sheet material bent to a substantially oval form, the adjacent ends of said strip being hooked to engage over horizontal frame members of a swing standard.

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