

Nov. 12, 1935.

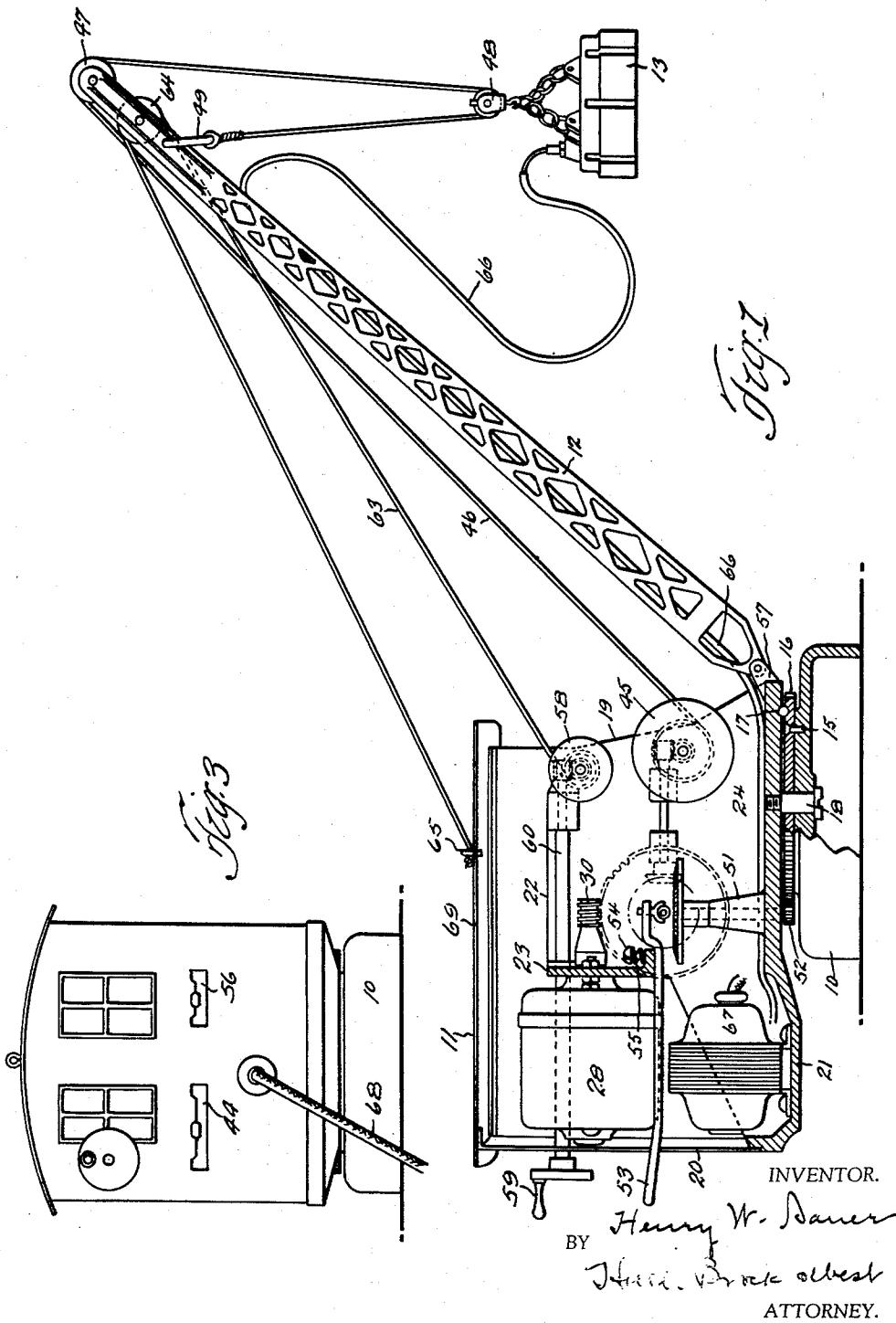
H. W. SAUER

2,020,802

TOY MAGNET CRANE

Filed Jan. 29, 1934

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

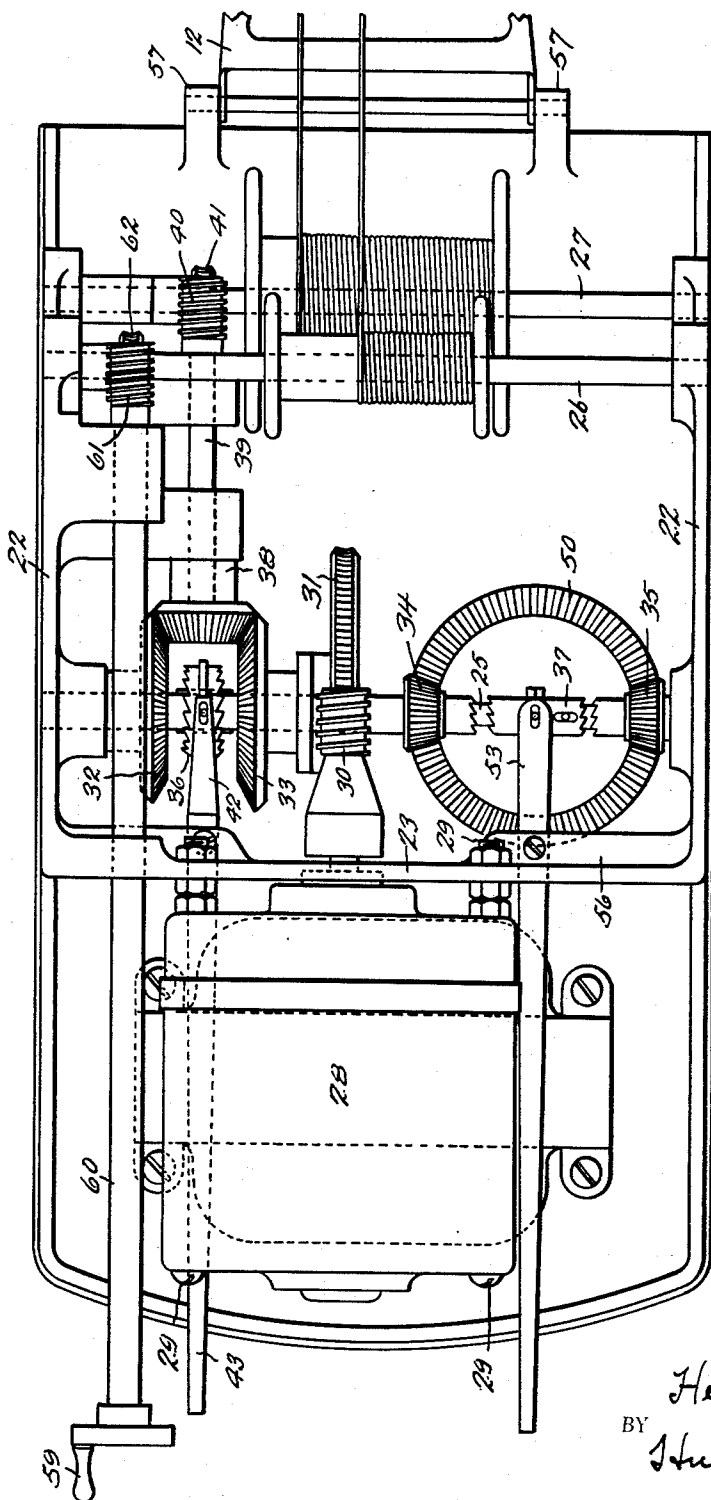


Fig. 2

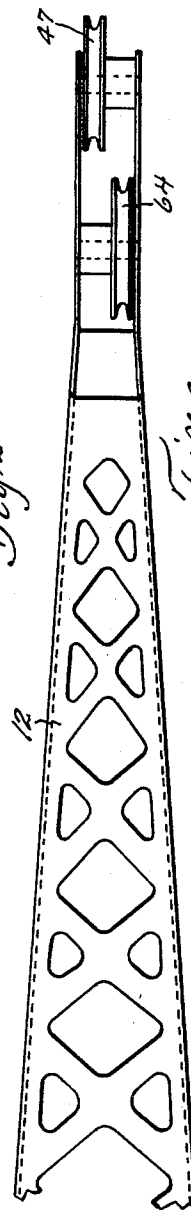


Fig. 4

INVENTOR.

Henry W. Sauer

BY

Shull, Brock & Albert

ATTORNEY.

UNITED STATES PATENT OFFICE

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TOY MAGNET CRANE

Henry W. Sauer, South Euclid, Ohio, assignor to
The Ohio Electric Mfg. Co., Cleveland, Ohio, a
corporation of Ohio

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5 Claims. (Cl. 46—37)

This invention relates to a toy magnet crane, and particularly to one having the general external appearance and many of the mechanical characteristics of larger devices such as might be used for handling scrap iron or the like.

The principal object of the invention is to provide a toy of the type indicated which will be entertaining and instructive and at the same time durable, cheap and accessible as to its operating parts.

Other and more limited objects will become apparent from the following description when taken in connection with the accompanying drawings in which Fig. 1 is a side elevation, partly in section; Fig. 2 is a fragmentary plan view drawn to a larger scale; Fig. 3 is a rear elevation; and Fig. 4 is a detail of the extremity of the crane member.

Referring now to the drawings, the numeral 10 indicates a base upon which is mounted a body indicated generally by the numeral 11 and which carries a crane member 12 from which is suspended an electric lifting magnet 13.

The base 10 is comprised of a hollow stamping having a flat central portion merging into a flange 14. Attached to the upper surface of the base 10, as by screws 15, is a gear member 16 having in its upper surface a ball race adapted to receive ball bearing members 17. Passing through the base 10 and centrally through the gear means 16 is a shouldered screw 18.

The body 11 comprises in this embodiment a casting indicated generally by the numeral 19, together with the various mechanisms mounted thereon including a top or casing 20. The casting 19 consists of a floor 21, upright side walls 22 and a transverse wall or web 23 joining the side walls 22 and positioned forwardly of the rear end of the floor 21. The floor 21 is provided with a threaded opening adapted to receive the threaded end 24 of the screw 18, the shoulder of the screw 18 being adapted to abut the bottom of the floor 21 to limit the upward travel thereof so as not to bind or clamp the floor tightly against the gear means 16. The floor 21 is provided with a complementary ball race for the ball bearing members 17. Journaled in the side walls 22 are a power shaft 25, a crane operating drum shaft 26 and a magnet operating drum shaft 27. The power shaft 25 is driven from an electric motor 28 mounted on the transverse wall 23 by bolts 29 extending through said motor and said wall and operatively connected with said shaft through the medium of a worm 30 carried by the end of the motor armature shaft and a

worm gear 31 with which said worm meshes and which is fixedly connected to said power shaft. Rotatably mounted loosely on the power shaft 25 are two pairs of opposed gears indicated by numerals 32 and 33 and numerals 34 and 35, respectively. Each of these gears carries a clutch element. Between the gears of each pair are clutch elements 36 and 37, respectively, which are slidably but non-rotatably connected to the power shaft 25. Constantly meshing with both the gears 32 and 33 is a pinion 38 connected to a shaft 39 which is journaled in suitable bearings and which drives the magnet controlling winding drum shaft 27 through the medium of a worm 40 and worm gear 41. The clutch element 36 is controlled by a lever 42 pivotally mounted on the bottom of the transverse wall 23 and having a terminal portion 43 extending to the outside of the body member 11 through a suitable opening 44 provided with positioning notches at neutral position and at the two operating positions. From this it will be obvious that a mechanism has been provided whereby the magnet may be raised and lowered by reversing the direction of rotation of the drum 45 carried by the shaft 27 and upon which is wound the cable 46 which passes over the pulley 47 on the crane member 12 and through the pulley block 48 and is connected to the crane member 12 by the ring 49. Meshing with the gears 34 and 35 is a large gear 50 connected to a shaft which is journaled in a boss 51 on the floor 21 and carries a pinion 52 positioned below the floor 21 and meshing with the gear 16. The clutch element 37 is operated by a lever 53 similar to that 42 and pivotally connected to the bottom of the transverse wall 23 by a pin 54 passing through a spring 55 and the flange 56 at the bottom of said wall. This lever has its extremity extending to the outside of the housing 20 through a suitable opening 56 similar to that 44. From the foregoing, it will be seen that by manipulation of the lever 53, the body and crane member may be swung about the screw 18 in either direction. For the purpose of raising and lowering the crane member 12 that is causing it to pivot about the point 50, I provide a winding drum 58 carried by the shaft 26 and operated by a hand crank 59 through the medium of a shaft 60, a worm 61 and a worm gear 62. Wound upon the drum 58 is a cable 63 which passes over the pulley 64 carried by the upper end of the crane member 12 and connected to the body at the point 65. Suspended from the pulley block 48 is the electric lifting magnet 13 supplied with

electric current through the cable 66 which drives its current from a transformer 67 mounted upon the floor 21. It should be noted that substantially all the mechanism, especially the motor 28 and transformer 67, is mounted at the rear of the body for counterbalancing effect. By reference to Fig. 4, it will be seen that the pulleys 47 and 64 are staggered to avoid interference of the cables with one another. The motor and transformer are supplied with house current by a suitable extension cord 68. A sight opening 69 may be provided in the top of the housing 20 for enabling a child to view the mechanism; or a transparent insert or complete transparent top may be provided for this purpose.

The lifting magnet employed is preferably of the construction shown in my copending application Serial No. 600,939, filed March 24, 1932, of which this is a division.

In view of the foregoing, it will be clear that I have provided a device which is well adapted for its intended purposes and while I have shown and described a preferred embodiment, I wish it understood that I am limited only in accordance with the appended claims and the prior art.

Having thus described my invention, what I claim is:

1. In a magnetic toy, a base, a body rotatable thereon, a crane member pivoted to said body, and an electro-magnet supported by said crane member, said body including a floor, upstanding side walls, a transverse wall located between the front and rear extremities of said floor, a power shaft journaled in said side walls, a motor mounted on said transverse wall, extending rearwardly therefrom overhanging said base and having a portion of its armature shaft extending forwardly, gear means connecting said motor in driving relation to said power shaft, means operated by said power shaft for raising and lowering said magnet, means also operated by said power shaft for rotating said body and crane with respect to said base and controls for said magnet raising and lowering means and said body and crane rotating means extending to the outside of said body.

2. In a magnetic toy, a base, a gear means fixed with respect to said base, a body mounted for rotation about an axis passing through the center of said gear means, a pinion rotatably carried by said body and meshing with said gear means, an electric motor supported by said body portion in overhanging relation to said base, and means including a clutch for transmitting power from

said motor to said pinion for rotating said body with respect to said base and means including a lever extending to the outside of said body for operating said clutch.

3. In a magnetic toy, a base, gear means fixed with respect to said base, a body mounted for rotation about an axis passing through the center of said gear means, a pinion rotatably carried by said body and meshing with said gear means, an electric motor supported by said body portion, means including a reversible driving connection for transmitting power from said motor to said pinion and means for controlling said connection including a lever extending to the outside of said body.

4. In a magnetic toy, a base, gear means fixed with respect to said base, a body mounted for rotation about an axis passing through the center of said gear means, a pinion rotatably carried by said body and meshing with said gear means, an electric motor supported by said body and overhanging said base, means including a clutch for transmitting power from said motor to said pinion for rotating said body with respect to said base, a crane member pivotally connected to said body means and carrying a pulley spaced from said body, a crane operating winding drum carried by said body opposite said motor, means for operating said drum, and a cable connected to said body, passing over said pulley and to said drum whereby said crane member may be raised and lowered.

5. In a magnetic toy, a base, gear means fixed with respect to said base, a body, having side and end walls, mounted for rotation about an axis passing through the center of said gear means, a pinion rotatably carried by said body and meshing with said gear means, a transverse wall extending between said side walls, an electric motor supported by said transverse wall and overhanging said base, means including a clutch for transmitting power from said motor to said pinion for rotating said body with respect to said base, a crane member pivotally connected to said body means and carrying a pulley spaced from said body, an electrically operated crane winding drum carried by said body, electrical means for operating said drum and a cable connected to said body, passing over said pulley and to said drum whereby said crane member may be raised and lowered, and controls for said electrically operated means including levers beneath said transverse wall and to the outside of said body.

HENRY W. SAUER.