June 20, 1950 F. D. MERRILL 2,512,166

TOY POWER SHOVEL

Filed June 10, 1946 4 Sheets-Sheet 1

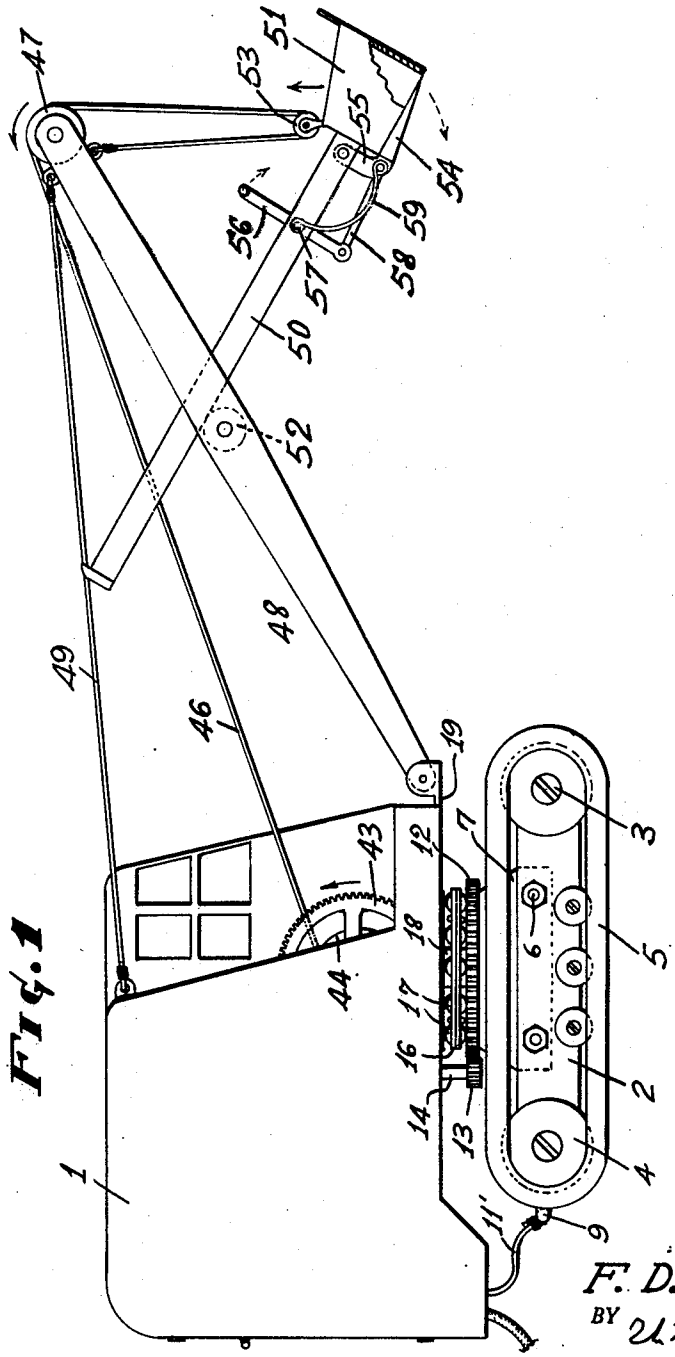


FIG. 1

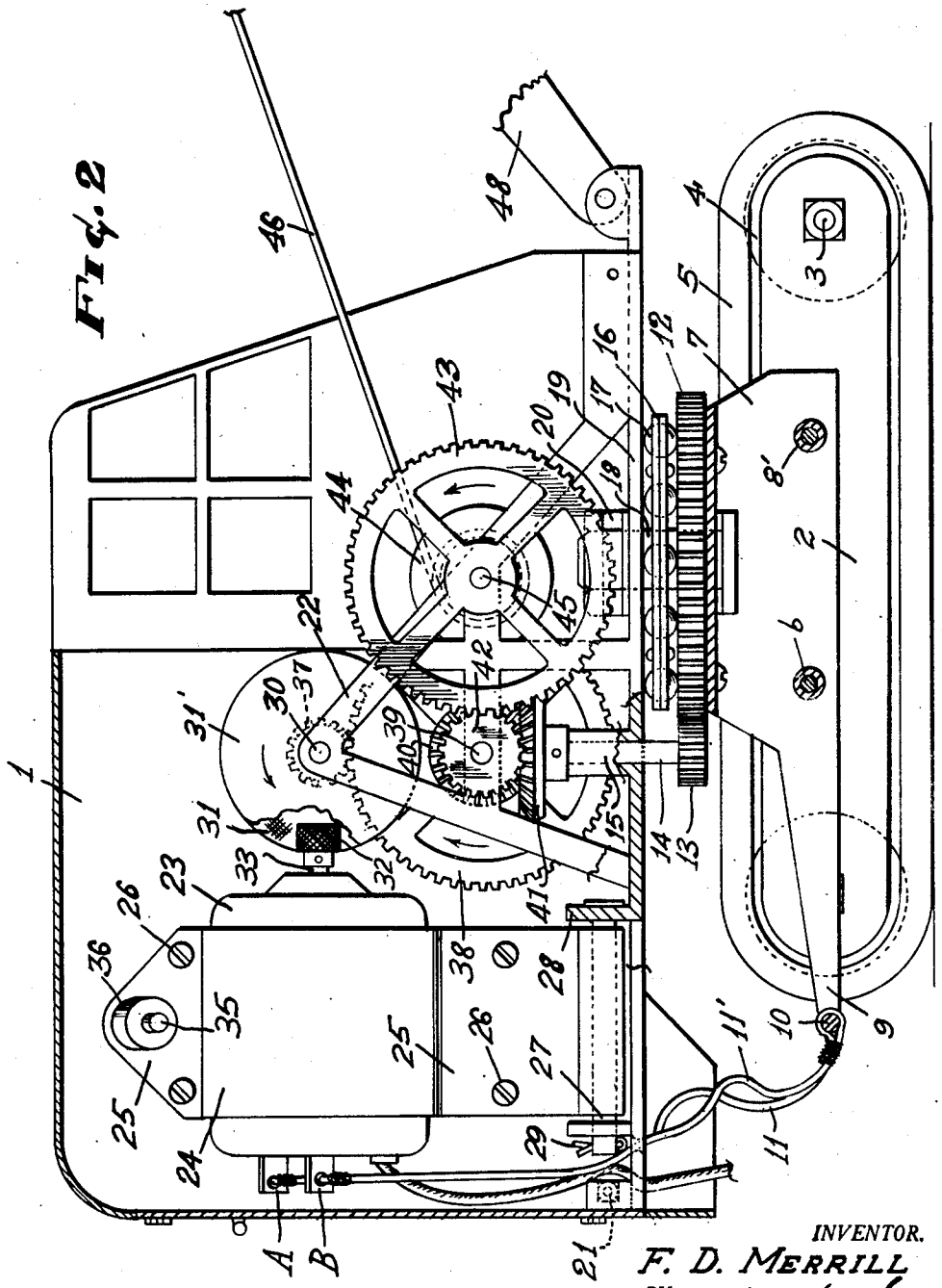
INVENTOR.
F. D. MERRILL
BY W. G. Charles
Atty

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Filed June 10, 1946 4 Sheets-Sheet 2

Fig. 2



INVENTOR.
F. D. MERRILL
BY U. G. Charles
atty.

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Filed June 10, 1946 4 Sheets-Sheet 3

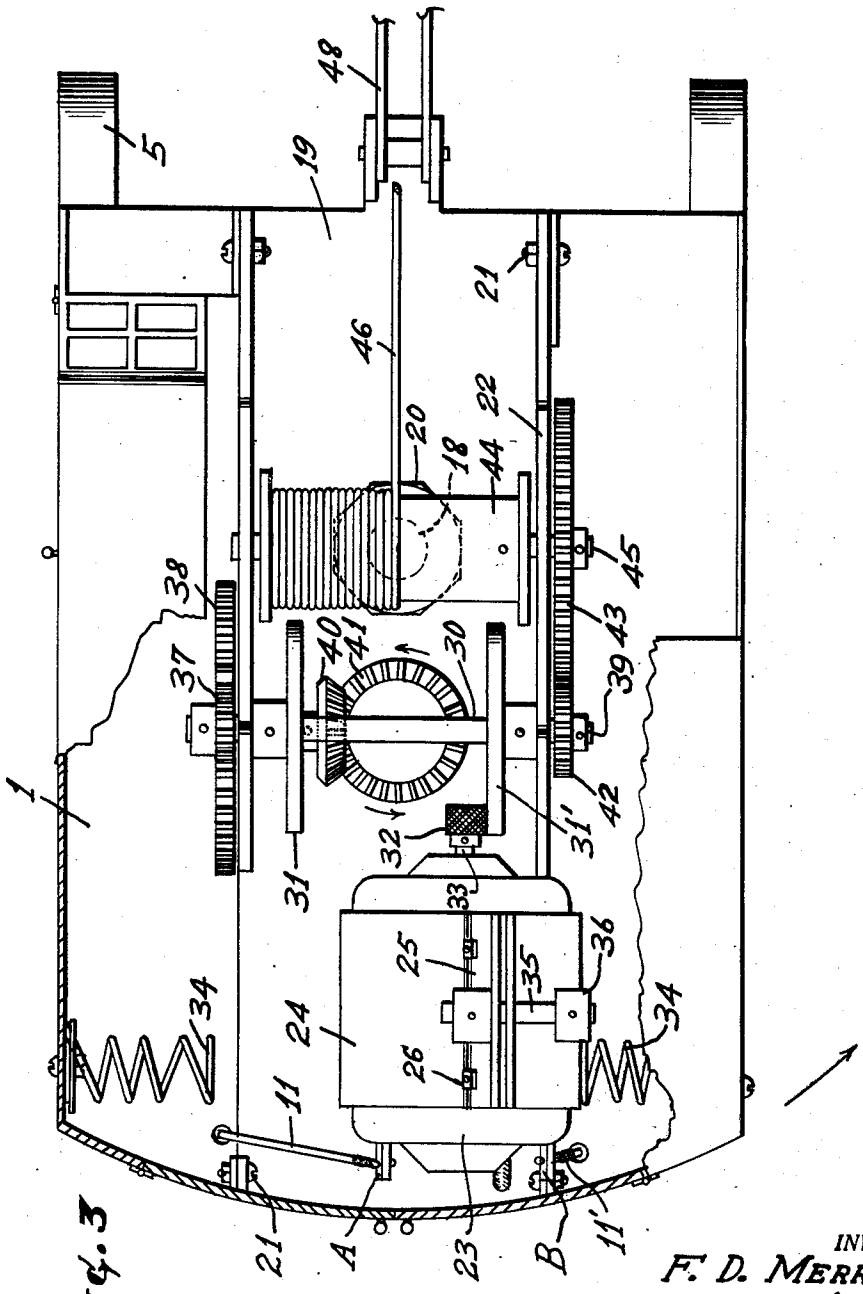


Fig. 3

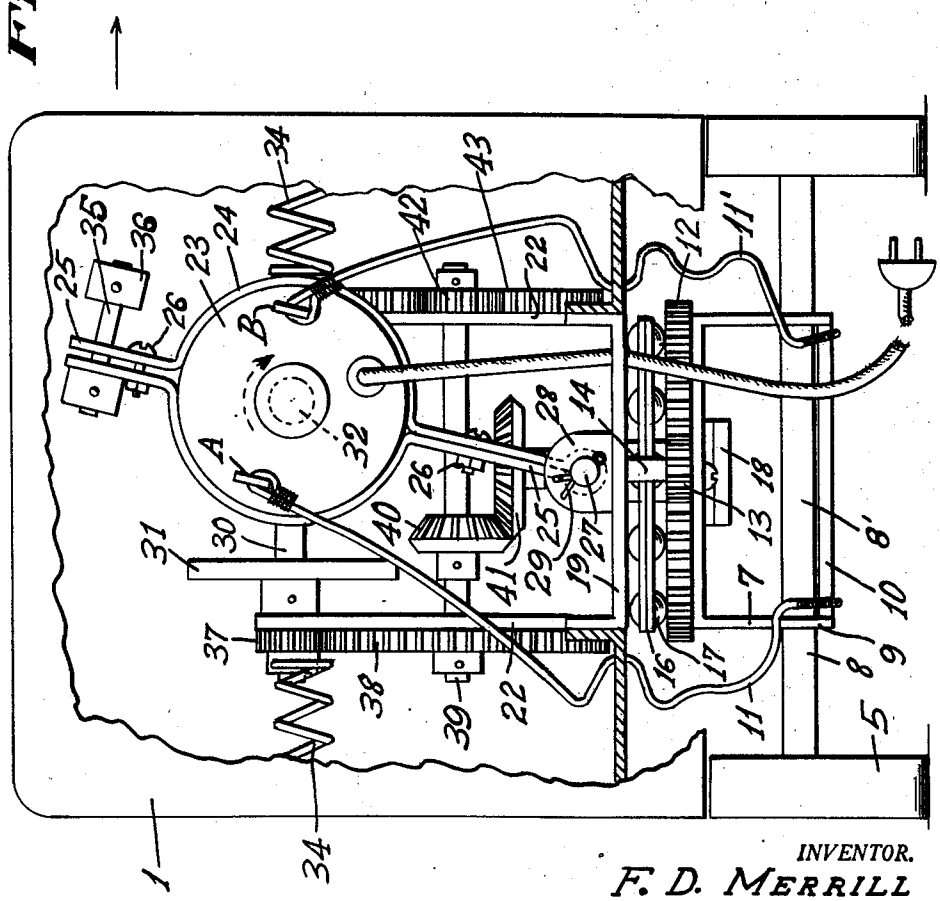
INVENTOR.
F. D. MERRILL
BY U. G. Charles
atty.

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Filed June 10, 1946 4 Sheets-Sheet 4

FIG. 4



INVENTOR.
F. D. MERRILL
BY W. G. Charles
Atty.

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TOY POWER SHOVEL

Frank D. Merrill, Russell, Kans.

Application June 10, 1946, Serial No. 675,583

2 Claims. (Cl. 46—40)

1

My invention herein disclosed relates to a toy power-shovel whose general appearance and movements are intended to simulate a conventional power-shovel machine, but not from a practical standpoint of actual service such as shoveling, dredging, excavating, or the like.

A further object of my invention is to place within a casing an electrically operated motor with automatic means to reverse its action, the ability of which is to simulate motions typical to those of a power-shovel machine during its practical service of scooping, raising and lowering the shovel through the medium of a boom rigidly carried by the casing that is adapted to turn to and fro on a horizontal plane to load and dump the shovel.

A still further object of my invention is to provide, as traction means for the toy, an imitation of a caterpillar tractor, but having wheels rotating in flexible belts to avoid marring a well-finished floor as the toy is being moved thereover from place to place by a cord, or the like, preparatory to plugging in its motor electric cord for further amusement.

These and other objects will hereinafter be more fully explained, reference being had to the accompanying drawings, forming a part of this specification, and in which like characters will apply to like parts in the different views.

Referring to the drawings:

Fig. 1 is a side elevation of the toy power-shovel.

Fig. 2 is an enlarged side view of the toy, parts removed for convenience of illustration.

Fig. 3 is a top view of the toy, parts removed to illustrate the motive power arrangement.

Fig. 4 is a rear view of the toy, parts removed to illustrate the rock of the motor.

As a more concise description of the drawings, it will be seen in Fig. 1, that a casing 1 is superimposed upon a portable carrier, said carrier comprising a pair of plates 2, spaced apart and rounded at their ends, at which points, spindles 3 are secured to their respective ends of the plates and on which wheels 4 are journalled, said wheels having an internally grooved belt 5 extending from wheel to wheel with respect to the front and rear wheels, said belts preferably being made from flexible material to simulate the chain of a caterpillar tractor. Said plates 2 are secured in spaced relation by a pair of rods 6, spaced apart, centrally disposed to the plates, and extending therethrough as carrying means for a channel member 7, centrally disposed to the first said plates, the legs of said channel member ex-

2

tending downward and being bored to receive the rods 6 extending therethrough, said channel member being centrally disposed between said plates 2 and secured by sleeves 8 functioning as spacers, the ends of which abut the legs of said channel member and plates, respectively, while sleeve 8' functions as means to avoid inward deflection of the legs of said channel. It will be seen that a portion of the channel member legs extend rearward as at 9 and are secured together by a rod 10, the ends of which abut their respective inner sides of the legs to function as an anchor for a pair of cables 11 and 11' secured thereto and extending upward for the purpose later described. The web of said channel member 7 has a gear 12 lying thereon and rigidly secured thereto, and having in mesh therewith a pinion 13, the shaft 14 of said pinion being vertically extending upward and being journalled in a suitable bearing 15 that is carried by the super-imposed structure, and having means, later described, to rotate the pinion, by which means the casing or superstructure is turned on the frame as mounted on the portable carrier.

Positioned on gear 12 is a ball bearing comprised of a pair of plates 16, the plates being bored in spaced relation therearound and in which balls 17 are retained, the bores of the plates being funnelled from their abutting sides to form a cavity in which the greater diameter of the balls will seat and be retained thereby. The bearing being arranged as above described will avoid the necessity of races as the plates and gear are axially bored and likewise the web of the channel member on which they seat, and having engaging upward therethrough a king pin 18, the head of which is beneath the web of said channel member, while the upper end of the king pin extends through the floor 19 of a gear frame structure that turns thereon and being secured by lock nuts 20. Said gear frame structure is centrally disposed in the casing with respect to the width and rigidly secured thereto by bolts 21 as shown in Figs. 2 and 3. It will be seen in Fig. 2 that the gear frame structure has an upwardly extending frame 22 on each side to function as end bearings for shafts extending therethrough as later described.

Positioned on the floor of the gearing frame structure is an electric motor 23, rockably carried in working relation to the frames and being centrally aligned therebetween and toward the rear end of the floor. The electric motor is rockably mounted on the floor through the medium of a clamp structure comprising arcuate jaws 24

and ears 25 oppositely extending from the jaws and being clamped together by bolts 26, the lower ears of said clamp extending downward and around a pin 27, said pin being journalled in a pair of ears 28 extending from the floor and secured by a cotter key 29, whereby the turning axis of the motor is rocked longitudinally of a shaft 30 to engage with a pair of discs 31 and 31' that are secured to the shaft 30 adjacent its ends as turning means therefor by a friction roller 32 secured to the motor shaft 33, and being so arranged, the motor will alternately engage the discs as reversing means for their rotation, while the motor turns in one continuous direction. It will be seen in Fig. 4, that the maximum rocking movement of the motor is restricted by the discs, and in co-action therewith are springs 34 secured to their respective sides of the casing and being substantially on a horizontal plane with the turning axis of the motor to function as a cushion against which the motor will strike but yield sufficiently for the engagement of the discs and friction roller. Furthermore carried by the upper ears of the clamp structure is a floating element consisting of a stud 35 of suitable length and having a separate weight 36 secured to each end, the weights being in spaced relation so that the stud will slide freely through the aperture at the longitudinal center of the ears, the sliding movement being stopped by the weights, at which instance, the rocking movement of the motor is intensified while on its movement from a vertical plane to its sides alternately, whereby contact between the friction roller and discs is increased to avoid sliding engagement.

It will be seen in Fig. 3 that the motor is rocked to the right side of the toy, in which position its roller is frictionally engaging with the right hand disc 31' to turn shaft 30 that is journalled in the frame 22 at its upper extremity. Secured to the shaft 30 is a pinion 37, said pinion being in mesh with gear 38 that is secured to shaft 39, said shaft extending from side to side of the frame 22 and being journalled therein, said shaft 39 having secured thereon a bevel gear 40 as power transmitting means to another bevel gear 41 mounted on its shaft 14, said shaft 14 on its lower end having secured thereto the pinion 13 that is in mesh with gear 12 that is stationarily secured to the web of the channel member 7, heretofore described, as turning means for the super-imposed structure.

The shaft 39 has a pinion 42 secured hereon that is in mesh with gear 43 as turning means for a cable drum 44, said drum being mounted on a shaft 45 that is journalled between the sides of the gear frames 22. Said drum has wound thereon a cable 46 that extends forward to a pulley 47 that is journalled on the forward end of a boom 48, the boom being connected with the floor of said gear frame structure from where it extends upwardly slanting and anchored by a cable 49 secured adjacent its outer extremity of said boom and to the top of the casing.

It will be seen that the boom consists of a pair of beams spaced apart to provide an opening for the stick 50 of a shovel 51 to slidably engage therebetween and being supported by a roller 52 carried by the beams and on which the stick will engage as the shovel is raised and lowered by the cable 46, the free end of which is secured to the forward end of the boom and extends downward through a pulley 53 that is centrally journalled on the shovel as raising and lowering means therefor as the drum is turned during reciprocal rotation of the casing as turned on the king pin by the train of gears just described.

To simulate a practical shovel and some of its actions, it will be seen that the shovel has a rockably connected bottom 54 that pivotably connects to the lower end of the stick through the medium of an arm 55 that is secured to the back of the bottom 54 and rockably therewith. To open the bottom 54 there is provided a lever 56 rockably connected to the stick as at 57, the lower end of which is rockably connected to the bottom 54 by a link 58, the upper end of the lever being adapted to strike the underside of the boom as the shovel structure is raised by the cable, at which time, the lever is rocked forward as indicated by its arrow, drawing the bottom therewith in the direction of its arrow. The above described action is to indicate dumping of the shovel. Retraction of the shovel is accomplished through the medium of a spring 59, one end of which is secured to the pivot point where the lever rocks on the stick, while the other end is secured to the said arm of the bottom 54 at its lower end, whereby when the shovel is lowered the spring instantly closes the bottom, all of which practically simulates unloading of the shovel and replacement of its bottom of a practical machine. It will be seen that Fig. 1 of the drawing illustrates the shovel pendantly carried intermediate of its upper and lower maximum movements, while in the rocked position of the motor as shown in Fig. 4, the shovel is being raised, and when the motor is engaged with the disc 30 the shovel is lowered; consequently the alternate rock of the casing above the portable carrier, will cause the shovel to be lowered and raised, to its maximum movement, all of which is due to the gear arrangement and the rocking movement of the motor to reverse the gears.

To rock the motor, it will be seen that cables 11 and 11' have their upper corresponding ends oppositely secured to the motor as at A and B while their other ends are oppositely secured to the ends of rod 10 as heretofore described; consequently as shown in Fig. 4, the rear end of the casing is being rocked anti-clockwise, in which case, slack in cable 11 is taken up, and when tensioned, a further movement of the casing occurs, and the motor will be rocked in the other direction by said cable 11, so that the motor roller will engage the other disc to reverse the action of the train of gears and vice versa as the casing is rocked to and fro by pinion 13 in its engagement with gear 12, the latter being stationarily secured, while the pinion is subject to reversing movements as above described.

It will be understood that during disengagement of the motor on its path from disc to disc, the casing continues to move in its established direction under force of momentum to carry the rocking point of the motor across its vertical axis, so that by gravity action, it will continue to approach the discs, selectively, to alternately reverse the gear train movement repeatedly.

Such modifications may be made as lie within the scope of the appended claims.

Having fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. A toy power-shovel comprising a carrier and a casing mounted on the carrier and king pin means securing said casing on said carrier to permit said casing to turn thereon oscillatably, spaced upright frames secured in said casing, a horizontally positioned rotatable shaft journalled

in said frames, a pair of spaced discs secured on said shaft, interengaged gear means mounted on said shaft and said carrier as turning means for the casing, a motor having a unidirectional rotating horizontal shaft and a roller carried on the motor shaft and driven thereby, a clamp loosely rockably mounted in said casing and the motor secured thereto above the pivot point to form an overbalanced pivoted system with the roller positioned between the pair of discs, and held by the weight of the system against one of them, the roller engaging the discs alternately as the motor is rocked from side to side, thereby alternately reversing the direction of rotation of said shaft, and a pair of cables having one set of ends secured to laterally opposed portions of the motor housing, the other corresponding ends being attached to their respective sides of the carrier, whereby the casing is driven about its king pin relative to the carrier by the motor,

thereby tautening the respective cable, which rocks the motor and roller out of engagement with one disc and into engagement with the other disc to reverse the mechanism.

2. A toy power-shovel as recited in claim 1, a spring carried by the casing on each side of the motor against which the motor will slightly engage as shock absorbing means in the motor's extreme rocking movements.

FRANK D. MERRILL.

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