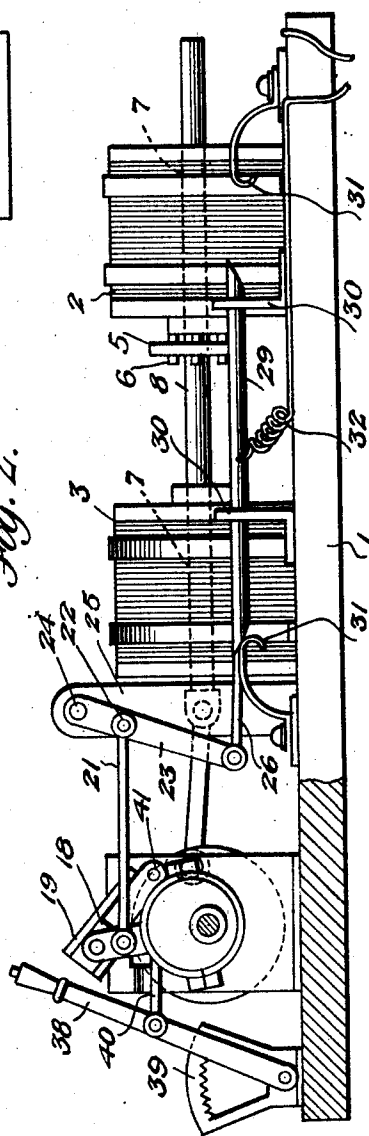
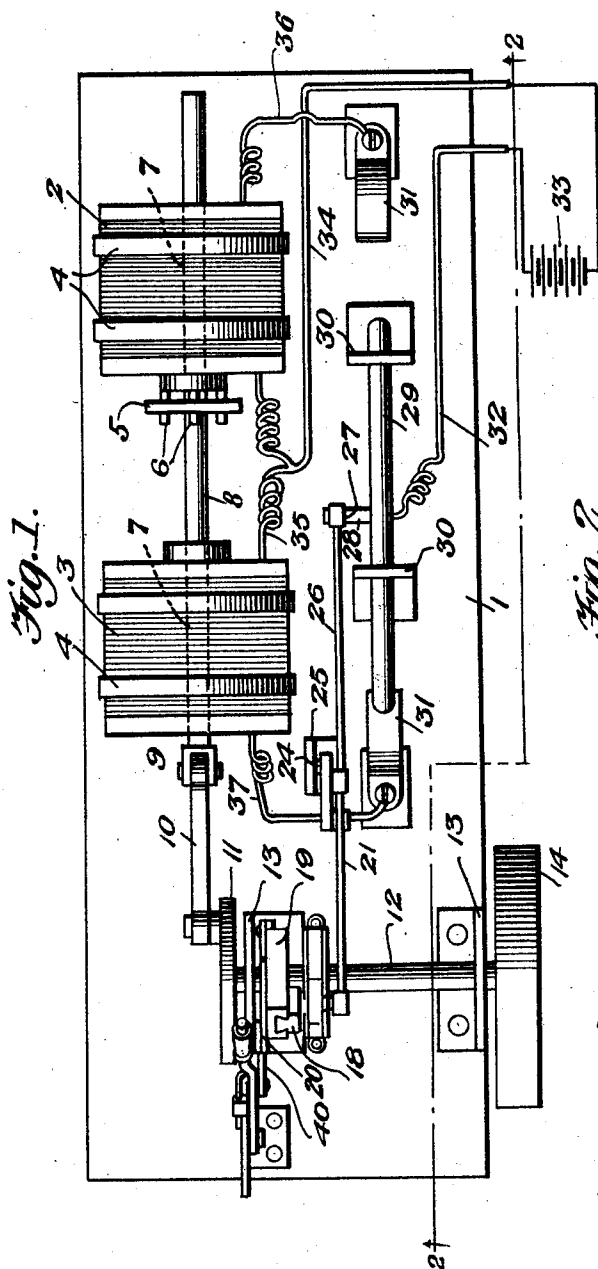


1,428,489.

Patented Sept. 5, 1922.

2 SHEETS—SHEET 1.



E. A. Schman Jr.

WITNESS:

Harrison Mace

INVENTOR

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ATTORNEY

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2 SHEETS—SHEET 2.

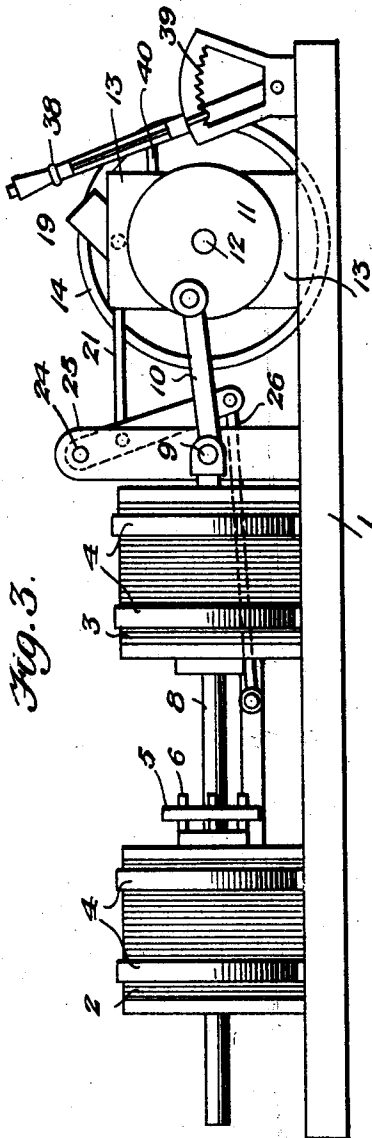


Fig. 3.

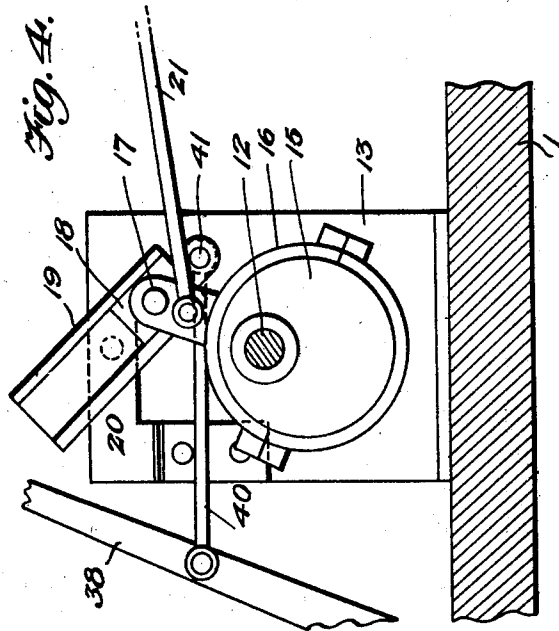


Fig. 4.

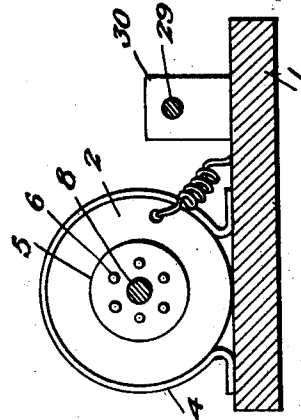


Fig. 5.

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UNITED STATES PATENT OFFICE.

HARRISON MACE, OF SIDEWOOD, SASKATCHEWAN, CANADA.

ELECTRIC ENGINE.

Application filed February 6, 1920. Serial No. 356,723.

To all whom it may concern:

Be it known that I, HARRISON MACE, a citizen of the Dominion of Canada, residing at Sidewood, in the Province of Saskatchewan and Dominion of Canada, have invented new and useful Improvements in Electric Engines, of which the following is a specification.

This invention relates to electric or magnetic engines, the object in view being to produce a simple engine of the class described which will operate in a positive manner and which may be easily started so as to rotate the crank shaft thereof in either direction as may be desired.

A further object of the invention is to provide in connection with an engine of the class above referred to, manually operable means whereby the engine may be started and stopped and reversed as to the direction of rotation of the crank shaft.

With the above and other objects in view, the invention consists in the novel construction, combination and arrangement herein fully described, illustrated and claimed.

In the accompanying drawings:

Figure 1 is a plan view of the engine.

Figure 2 is a side elevation of the same, part taken in section along the line 2—2 of Figure 1.

Figure 3 is also a side elevation of the engine looking toward the opposite side from Figure 1.

Figure 4 is a central vertical longitudinal section through the engine.

Figure 5 is a fragmentary vertical transverse section showing the formation of the armature.

In a simple embodiment of the invention as illustrated in the drawings, 1 designates a supporting base or bed plate upon which the main parts of the engine are mounted.

2 and 3 designate two electromagnets which are fastened to the bed plate 1 by means of clamping straps 4 said electromagnets being therefore immovable. The magnets 2 and 3 are arranged in end to end and spaced relation to each other so as to accommodate the back and forth or reciprocatory movement between the same of an armature 5 shown in the form of a disk of soft iron having a series of pins 6 extending in opposite directions therefrom toward the magnets 2 and 3 so as to be attracted by said magnets. The magnets 2 and 3 are formed with longitudinal bores or guideways 7 in

which is slidably received a guiding member or rod 8 preferably of brass or any other suitable material. The rod 8 extends entirely through the magnets 2 and 3 and has connected thereto by means of a pivot 9 a pitman or connecting rod 10 which extends to the wrist pin of a crank disk 11 mounted fast on one end of a crank shaft 12 which is journaled in bearings 13 secured to and extending upwardly from the bed plate 1, said shaft being provided with a combined fly wheel and band wheel 14 as shown. The armature 5 is rigidly secured upon the rod 8 by any suitable means.

The crank shaft 12 has fast thereon an eccentric 15 around which is an eccentric strap 16 having a holding arm 17 which is pivotally connected to a block 18 adjustable in a guide 19 which is adjustably secured to a support or arm 20 attached to the adjacent bearing 13. The strap 16 is thus pivotally and slidably mounted so as to admit of the rotation of the eccentric 15 within said strap. Extending from the strap 16 is a connecting rod or link 21, the same being connected by a pivot 22 to an upright lever 23 which is pivotally mounted at 24 on a support 25 secured to and extending upwardly from the bed plate 1. Pivotaly connected to the lower end of the lever 23 is another connecting rod or link 26, the latter being connected by a joint 27 to an arm or extension 28 extending laterally from a longitudinally slidable switch bar 29, the latter being slidably through bearings 30 secured to and extending upwardly from the bed plate 1.

Arranged in the path of the slidable switch bar 29 are two brushes 31 secured to and insulated from said plate 1. Flexibly connected to the switch bar 29, is a circuit wire 32 extending to a battery or other source of electrical energy 33, a wire 34 extending from said battery 33 to the magnet 2 and by an extension wire 35 to the magnet 3. From one of the brushes 31, a wire 36 leads to the magnets 2 and from the other brush 31 another wire 37 leads to the magnet 3. Due to such arrangement of wires and circuits as the sliding switch bar 29 reaches the limit of its movement in one direction, one of the magnets is energized and when said switch bar moves in the opposite direction, the other magnet is energized. As a result, the armature 5 is attracted back and forth or in other words a reciprocatory movement is imparted there-

to and due to the mechanical connection described, the rotary motion is imparted to the crank shaft 12, from which by means of the eccentric controlled connection, reciprocatory motion is imparted to the slidable push bar 29 for the purpose above described, of alternately energizing and de-energizing the magnets in the way described.

In connection with the mechanism above described, I employ a hand lever 38 adapted to be held at any point of adjustment by means of a notched rock 39 secured to the bed plate 1. A rod 40 connects the lever 38 with the upwardly extending arm 41 of the eccentric 16 so that by movement of the lever 38, the sliding switch bar 29 may be moved into contact with either one of the brushes 31 for the purpose of starting the engine in a certain direction as decided upon by the operator in advance. By the same means, the engine may be stopped and the direction of rotation of the crank shaft reversed.

The engine hereinabove described is simple in construction, reliable in operation and may of course be made in any size to give any desired power required.

What I claim is:—

An electric engine comprising in combina-

tion a pair of electro-magnets having their cores provided with guide bores, a rod having its end portions slidable through said bores, an armature secured upon said rod and moveable between the magnet cores, a support, a crank shaft journaled through said support and having a crank portion, a link connected with said rod and with said crank portion, a magnet controlling circuit including two contacts, and a reciprocatory switch bar adapted to contact therewith alternately, an eccentric cam on said shaft, a strap encircling said cam and having an arm, a guide pivoted upon said support, a slide movable within said guide and pivotally connected with said arm, a rod connected with said arm and with said reciprocatory switch bar, and means connected with said guide whereby to reverse its position for bringing the switch bar initially in engagement with either of said contacts, said means comprising a pivoted lever, a link connected with said lever and with said arm, and a notched segment moved over by the lever and adapted to hold the latter in selected position.

In testimony whereof I affix my signature.

HARRISON MACE.