(No Model.)

L. DAFT.

ELECTRIC MOTOR.

No. 258,383. Patented May 23, 1882.

Fig. 1

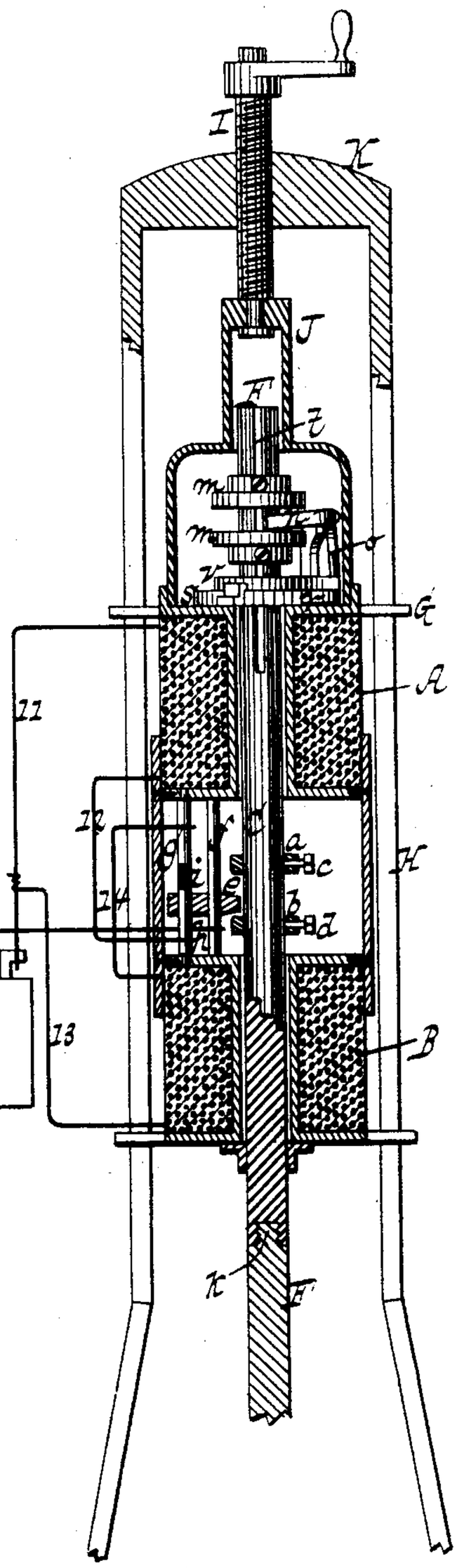


Fig. 2

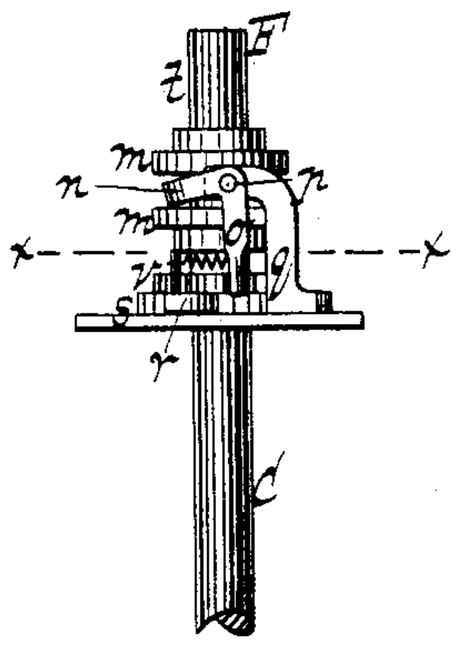
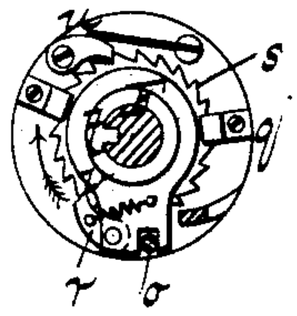


Fig. 3.



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UNITED STATES PATENT OFFICE.

LEO DAFT, OF GREENVILLE, NEW JERSEY.

ELECTRIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 258,383, dated May 23, 1882.

Application filed January 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, LEO DAFT, a subject of the Queen of Great Britain, residing at Greenville, in the county of Hudson and State of New Jersey, have invented new and useful Improvements in Electric Motors, of which the following is a specification.

This invention relates to a device for imparting a reciprocating motion to a metallic rod by the action of electricity; and the invention consists in the combination of two axial magnets, a soft-iron core common to both, and a commutator which is actuated by the core so as to close an electric circuit alternately through the helices of the axial magnets, thereby imparting to the core a rapid reciprocating motion. With the axial magnets is combined a frame which moves on suitable guides and is adjusted by a feed-screw.

This invention is illustrated in the accompanying drawings, in which Figure 1 represents a vertical section of my invention. Fig. 2 is a side view of the mechanism for imparting to the core a revolving motion. Fig. 3 is a horizontal section of the same in the plane *x x*, Fig. 2.

Similar letters indicate corresponding parts.

In the drawings, the letters A B designate two axial magnets, which are placed in line with each other, and which have a common soft-iron core, C. On this core are secured two rings, *a b*, by means of set-screws *c d*, and if the core moves up and down these rings serve to actuate the circuit-changer *e*, which slides on a metallic rod, *f*, and embraces a sectional rod, *g h*, the two sections of which are connected by a hard-rubber section, *i*, or by any other suitable insulating materials. D represents a battery or any other suitable generator of electricity, such as a dynamo-electric machine, and the connections between this generator of electricity and the several parts of my device are as follows: The metallic rod *f* connects by a wire, 10, with one—say the negative—pole of the generator. The other (positive) pole of the generator connects by a wire, 11, with one end of the helix A, and the other end of this helix connects by a wire, 12, with the section *h* of the sectional rod *g h*. The positive pole of the generator also connects by a wire, 13, with one end of the helix B, and the other end of this helix connects by the wire 14 with the section *g* of the rod *g h*.

In the position shown in the drawings the circuit is closed through the helix A by wires 11 and 12, circuit-changer *e*, rod *f*, and wire 10, the core C moves upward, the circuit-changer *e* is carried up so as to embrace the section *g* of rod *g h*, the circuit through helix A is broken and that through helix B is closed, (wires 13 14, circuit-changer *e*, rod *f*, and wire 10,) the core C moves downward, the circuit-changer is carried down to the position shown in the drawings, and so on.

In order to secure the best effects it is desirable that the soft-iron core C should be somewhat shorter than the distance between the two outer flanges of the axial magnets A B. At the same time it is necessary that the core should be properly guided throughout the entire length of its stroke. This purpose I effect by applying to both ends of the core extensions F F, which are made of some non-magnetic metal—such, for instance, as phosphor-bronze—equal in diameter to the core and connected to the same by screw-nipples *k*, as shown in the drawings, or by other suitable means.

The two axial magnets A B are secured in a frame, G, which moves in suitable guides, H, and which can be adjusted by a screw, I. For this purpose the frame G is provided with a yoke, J, to engage with the end of the screw, and the guides H are connected by a cap or cross-bar, K, which is tapped to correspond to the thread of said screw. This arrangement is desirable if my device is used for operating a rock-drill, in which case the drill is secured to the lower extension F of the core, and as the work progresses the frame G is gradually fed downward. At the same time the rock-drill has to be turned after each stroke, and for this purpose I apply a suitable device—such, for instance, as shown in the drawings. This device consists of the flanges *m m*, which are firmly secured to the upper extension F of the core C, and which act on the arm *n* of a bell-crank lever, *n o*, that has its fulcrum on a pivot, *p*, secured in a standard, *q*, which is fixed to the frame G. The arm *o* of said bell-crank lever engages with a ring, *v*, which turns on the extension F and carries a pawl, *r*, which