(No Model.)

E. C. NEWTON.

STEAM DYNAMO ELECTRIC MACHINE.

No. 436,148. Patented Sept. 9, 1890.

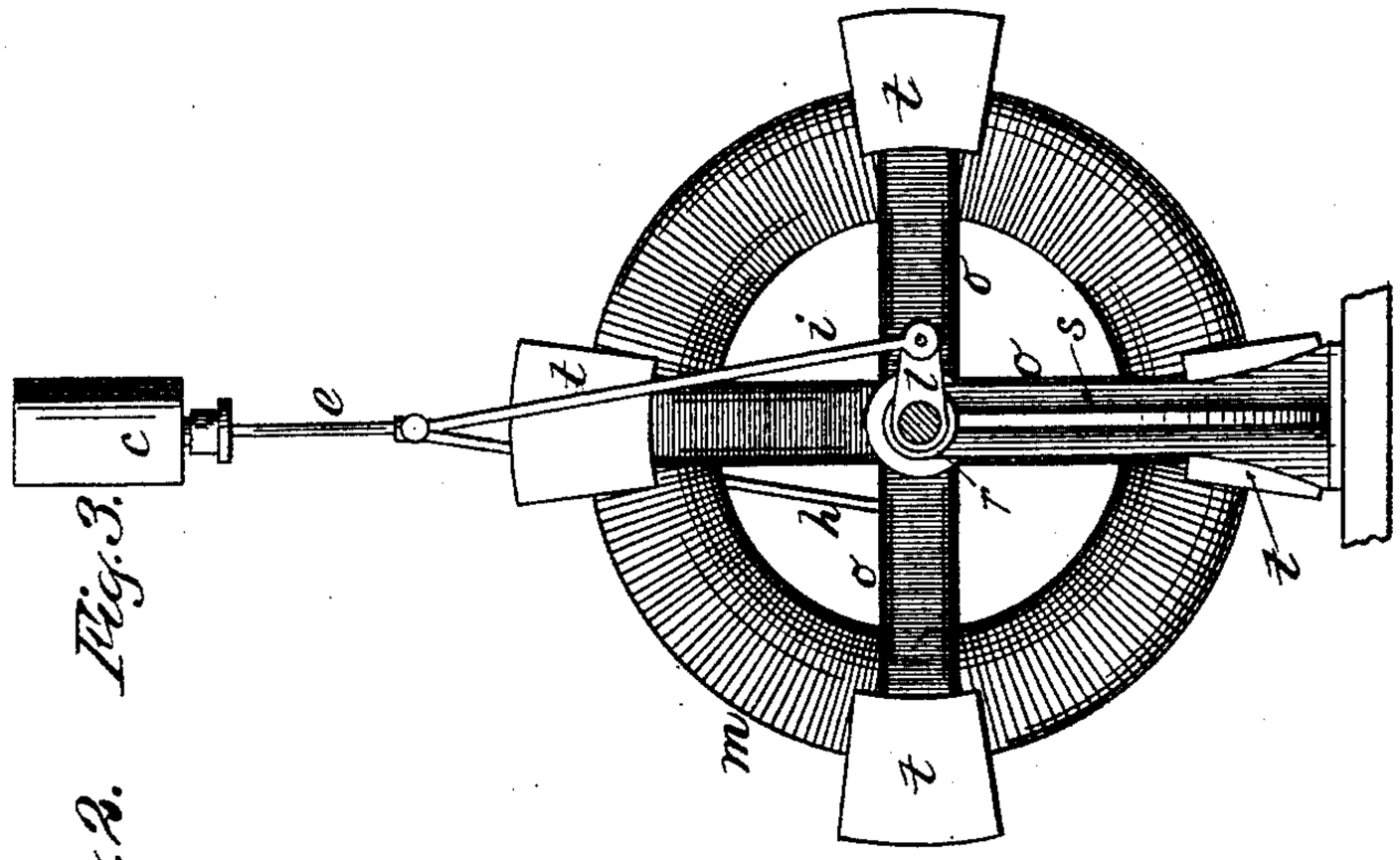

Fig. 3.

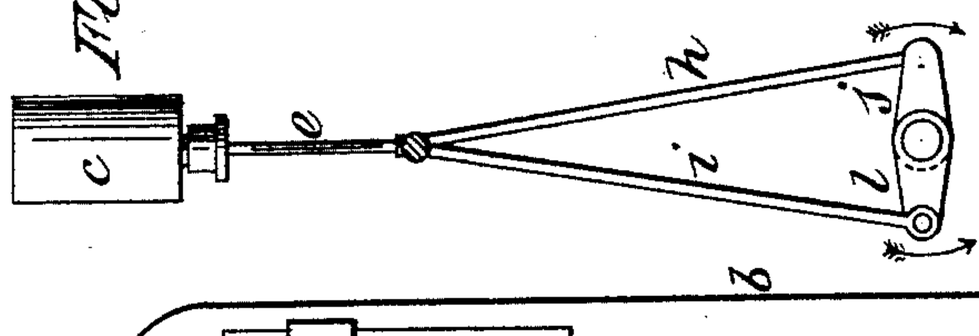

Fig. 2.

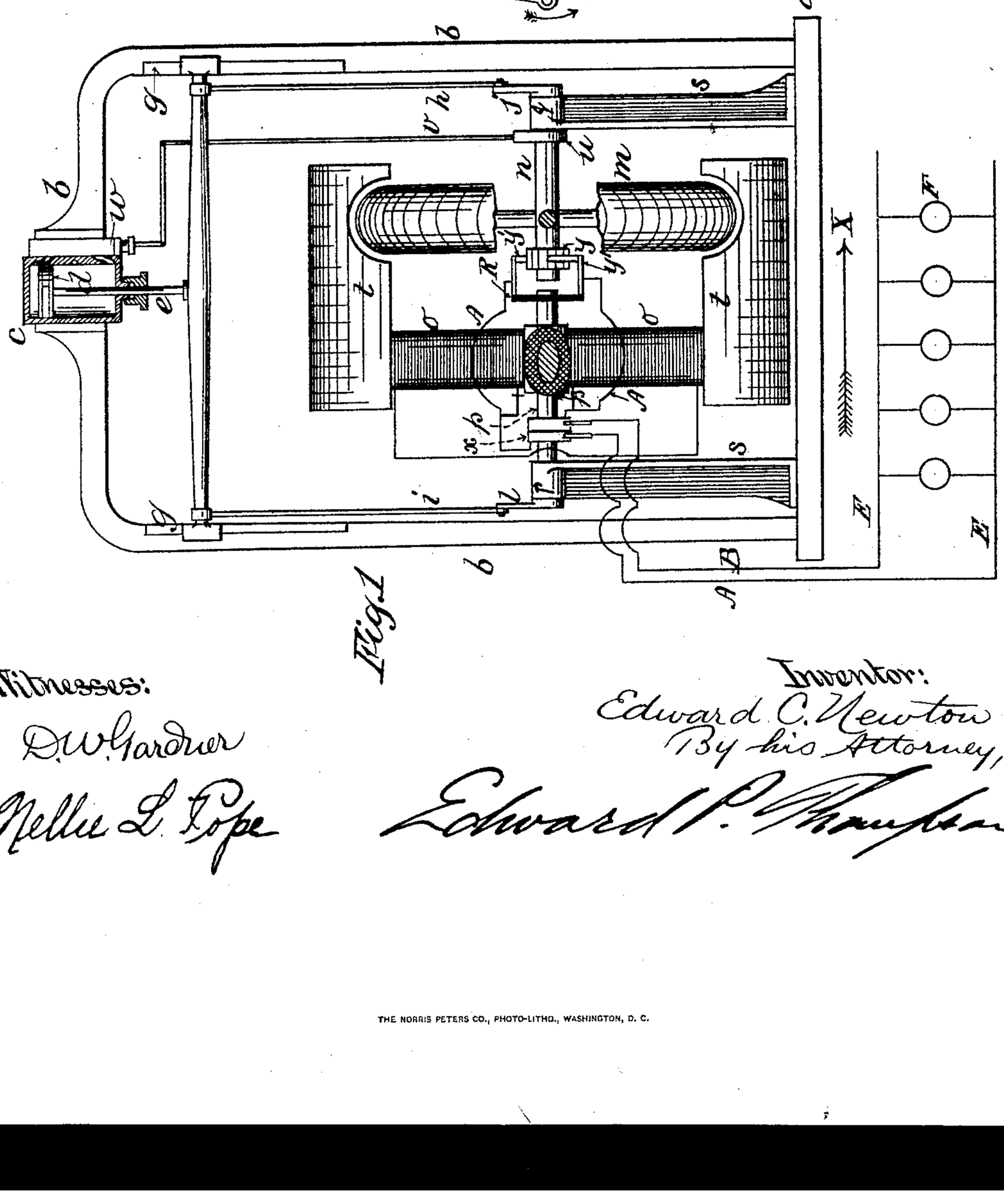

Fig. 1.

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UNITED STATES PATENT OFFICE.

EDWARD C. NEWTON, OF LITTLE ROCK, ARKANSAS.

STEAM DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 436,148, dated September 9, 1890.

Application filed October 30, 1889. Serial No. 328,640. (No model.)

To all whom it may concern:

Be it known that I, EDWARD C. NEWTON, a citizen of the United States, and a resident of Little Rock, county of Pulaski, and State of Arkansas, have invented certain new and useful Improvements in Steam-Dynamos, (Case No. 2,) of which the following is a specification.

My invention relates to a dynamo-electric machine in which the generating or armature cores are set in motion relatively to the field-magnet coils by means of a piston operated by steam, so that the device may be termed conveniently a "steam dynamo."

The object of the invention is to obtain higher efficiency of transformation of mechanical or steam power into electrical energy.

The general object of the invention is to provide a dynamo in which the transformation alluded to may be accomplished by a machine occupying less space than the usual steam-engine and dynamo ordinarily occupy.

The invention is illustrated as to means of carrying out my ideas in the accompanying drawings, in which—

Figure 1 is a vertical end elevation of the preferred type of my invention, showing also a work-circuit and electrical connections from the machine to the work-circuit. Fig. 2 is a detail view of the device shown in Fig. 1, illustrating the relative positions of certain two cranks in the preferred normal position ready for starting the machine. Fig. 3 is a vertical elevation in side view of Fig. 1, the supporting-frame for the steam-cylinder being omitted, and the figure (1) being looked at in the direction of the arrow X.

The device embodying my invention and shown in its preferred form in Figs. 1, 2, and 3, consists of the combination of a base-plate *a*, of metal, wood, or other suitable material; a frame *b*, attached thereto and supporting a steam-cylinder *c*, in which is adapted to operate a piston *d*, whose rod *e* is fastened to the cross-bar *f*; slides *g* on the inner surfaces of the said frame and receiving the said cross-bar, which slides upon the said slides or guides; connecting-rods *h* and *i*, connecting the said cross-bar to the cranks *j* and *l*, respectively; an armature or ring *m*, mounted and fixed upon a shaft *n*, to which the crank *j* is attached; a field-magnet *o*, fixed upon the shaft *p*, to which the crank *l* is attached, the said shafts being mounted, respectively, loosely in the bearings *q* and *r*, which are supported upon the uprights *s*, that stand upon the base-plate *a*, and pole-pieces *t* to the field-magnets enveloping portions of the armature *m*, and a shaft *n*, carrying an eccentric *u*, which operates the eccentric-rod *v*, passing into the steam-chest *w*, which is attached to the cylinder *c*.

It is evident that the field-magnet and the armature form fly or momentum wheels for the piston *d*. When the machine or steam-dynamo is to be operated, the cranks are supposed to be in the position shown in Fig. 2, or in a similar position, as long as the connecting-rods *i* and *h* form an angle to each other. If the piston is now operated by the steam from below or above, the two cranks *j* and *l* will turn in opposite directions, while the eccentric will perform its functions and cause a continuance of rotation of the field-magnet and armature; consequently the field and armature will operate in opposite directions. According to the well-known principles of induction, electric currents will be generated in the armature or ring *m*, as its coils are closed through suitable conductors and if the magnet *o* is energized or magnetized by a continuous current of electricity.

It is unnecessary to go into further explanation of how the currents are generated, except to say that the armature and field-magnet rotating in opposite directions results in a rapid relative motion of the two, so that although the actual motion of either the armature or field-magnet is, or would be at its best, comparatively slow in comparison to the motion generally maintained in the ordinary dynamo, yet this relative motion obtained by the armature and field-magnet moving in opposite directions is double what it would be if only either the field-magnet or armature moved.

The shaft *p* is provided with the usual collector *x*, and the shaft *n* with a commutator *y*. The brushes *y'* of the commutator *y* are in circuit through the conductors A and with the ring *m*. The brushes of the collector *x*

are in circuit through the conductors B with the work-circuit E, including the translating devices F. An alternating current is induced in the armature, and is then commutated into a direct current, a portion of which is shunted through the field-magnet, and the remainder flows through the translating devices F.

In Fig. 1 is shown means whereby the collector-brushes y' of the commutator y are caused to rotate with the field-magnet and thereby be kept on the revolving line of commutation. The shafts p and n all but meet in between the two sets of coils of the machine. Near the ends of the two shafts and on each is located, respectively, the brush-holder R and the commutator y, the brushes y' pressing on the said commutator, and so located that the brushes occupy the desired position relatively to the line of commutation.

I claim as my invention—

The combination of a reciprocating steam-engine provided with two connecting-rods, and a dynamo-electric machine whose field-magnet and armature are adapted to rotate in opposite directions and are connected, respectively, to the two connecting-rods.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 15th day of October, 1889.

EDWARD C. NEWTON.

Witnesses:
C. ANDERSON,
WM. H. CORNWALL.