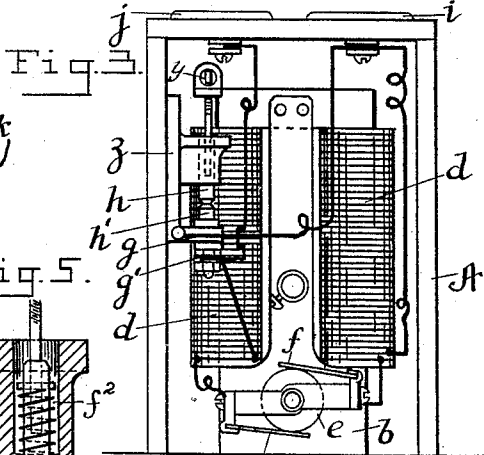
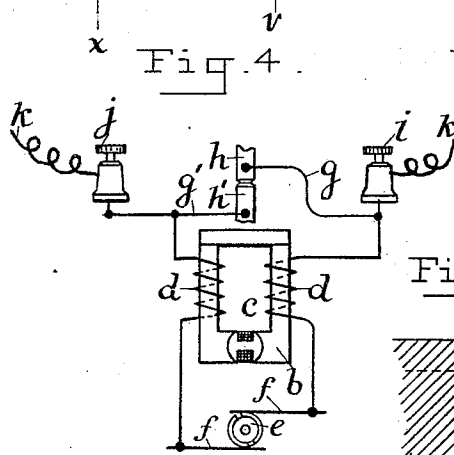
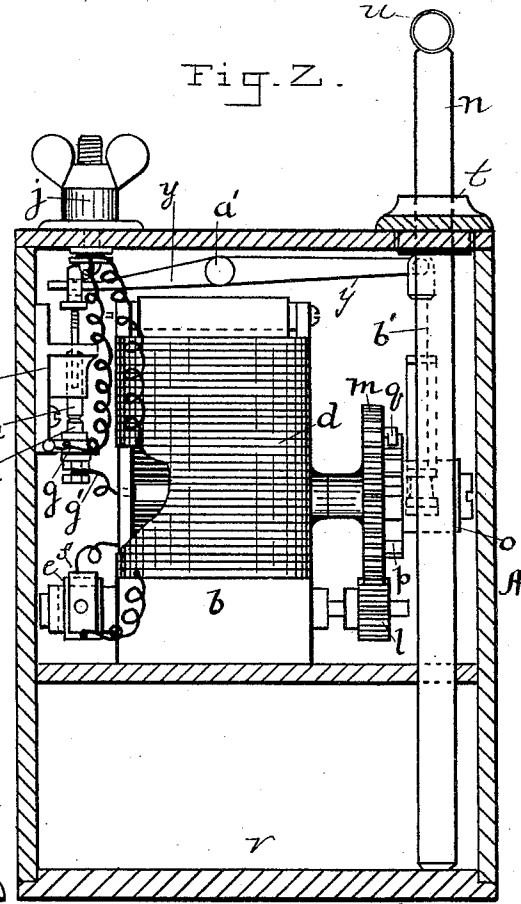
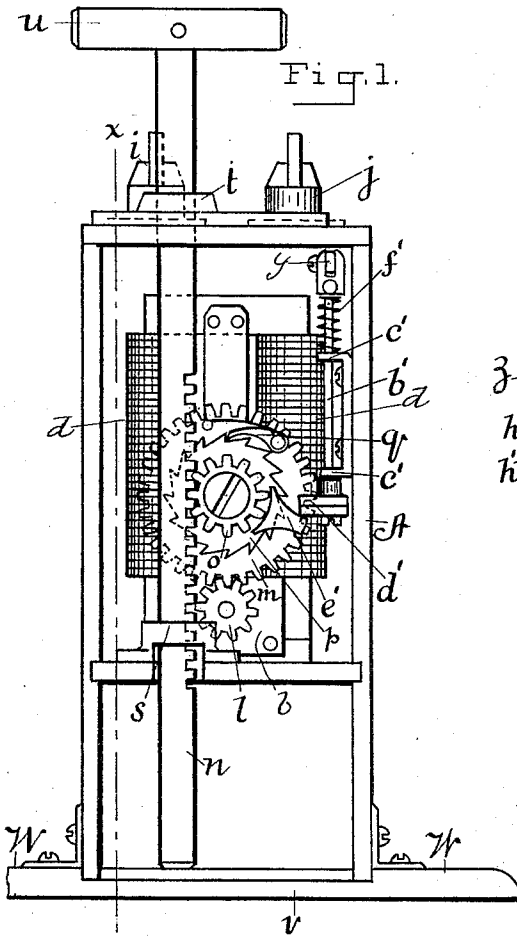


(No Model.)

J. N. McLEOD.
MAGNETO ELECTRIC MACHINE.

No. 530,235.

Patented Dec. 4, 1894.



WITNESSES.
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UNITED STATES PATENT OFFICE.

JOSEPH N. MCLEOD, OF BROOKLYN, NEW YORK.

MAGNETO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 530,235, dated December 4, 1894.

Application filed April 2, 1894. Serial No. 506,107. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH N. MCLEOD, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Magneto-Electric Machines, of which the following is a specification.

My invention relates to magneto-electric machines such as are used for exploding electric fuses in blasting and the like, and it consists of improved means of operating the armature and an improved construction of the circuit breaker, as hereinafter fully described, reference being made to the accompanying drawings, in which—

Figure 1, is an end elevation of my improved machine with the plate of the inclosing case removed. Fig. 2, is a sectional elevation of the case on line $x-x$, Fig. 1, showing the machine in side elevation with a part of the field magnet broken out. Fig. 3, is an end elevation of the upper portion of the machine in reverse of the view of Fig. 1, with the plate of the inclosing case removed, and Fig. 4, is a diagrammatic elevation showing the circuit connections. Fig. 5, is a detail of the contact device in section and enlarged.

a represents the inclosing case and b , the field magnet of the magneto machine mounted thereon, which is of the construction usually adopted in magneto blasting machines, c , being an ordinary shuttle wound Siemens armature, and d the exciting coils.

e , represents the commutator, whereof the brushes f , are connected in a short or local circuit $g g'$ which is normally closed through a circuit breaker $h h'$ while on opposite sides of this circuit breaker the wires are connected to the binding posts i and j , to which the line wires k extending to the fuses are connected.

It will be seen that the field coils are in series with the armature, and the field magnet being an electro-magnet, the first rotation of the armature serves by induction from the residual magnetism in the field magnet to generate a current which by being maintained on a short circuit, is caused to traverse only the low resistance of the coils d , and of the armature coil, so that by its inductive effect upon the field magnet, it quickly builds up

the magnetism thereof, and thereby in turn increases the electro-motive force generated in the armature, so that by the time the rotation of the latter has been continued sufficiently long to bring it to full speed, the electro-motive force has been increased sufficiently to enable it to force a current of sufficient volume over the resistance of the line to explode the fuses.

The circuit breaker $h h'$ is adapted to break the local circuit toward the end of the operating stroke, so that the electro motive force so accumulated is thus discharged over the line.

For improved means of operating the armature it is geared by the pinion l , on its shaft with the master wheel m , with which the pull-up toothed rack bar n gears by the pinion o , ratchet wheel p and the pawl q , so that when the rack bar is pulled up the armature will be rotated rapidly, and the bar will descend without effect on the armature, the ratchet wheel being free to turn independently of wheel m , when the bar descends, but engaging it by the pawl q when the bar is pulled up. The bar n is arranged in the guide ways s and t , and has a handle u , at the top for use in pulling it up, and the base plate v of the case has extensions w , by which the operator may hold it down on the ground with his feet while pulling the bar up. It is manifest that the apparatus may be adapted for effecting the operation of the armature by a push down movement of the rack bar if desired.

The circuit breaker consists of the before mentioned two parts h and h' , the said part h being a sliding rod connected to one end of a lever y and being in communication with the binding post i , through wire g of the local circuit and the bracket z , in which it slides, and which forms part of the circuit, and the part h' , being a fixed but insulated rod which is in communication with the binding post j , through wire g' of the said local circuit.

The lever y , to which the movable part h , of the circuit breaker is connected is pivoted at a' and its end opposite the one to which said part h is connected, has a pendent rod b' fixed in suitable guide ways c' and carrying a collar d' at its lower end in front of the face of the ratchet wheel p , from which a tappet arm e' projects suitably to contact

with said collar a little before the operating bar reaches the limit of its upward movement and shift the lever so as to separate the parts of the contact breaker to discharge the accumulated electro-motive force over the line. When the rack bar descends after each operation this tappet arm e' returns to its normal position below the collar d' as represented in Fig. 1 of the drawings and a coiled spring f' on rod b' also a coiled spring f'' , in the bracket z , Fig. 5, and also dotted in Figs. 2 and 3 normally close the contact again.

The pull-up rack bar is for certain reasons much preferable to a crank for working the master wheel to operate the armature in these magneto-electro-blasting machines, but in the arrangement adopted by me for its application in a prior machine patented April 11, 1893, No. 495,138, there was too much complication of the multiplying train owing to the fact that the prime mover of the train could be turned only a quarter of a revolution or thereabout by a full stroke of the rack-bar.

It will be seen that in the improved apparatus of this case a full turn of the master wheel is imparted by the one movement of the rack bar which simplifies the train considerably and the machine works much easier.

I claim as my invention—

1. In a magneto electric machine, the combination with the rotary armature and the toothed rack bar and ratchet wheel for operating said armature, of a circuit breaker consisting of the stationary and movable parts normally in contact and connected in the

local circuit and respectively connected with the line wires, the lever connected with the movable part of said circuit breaker, the collar connected with the lever and the tappet arm of the ratchet wheel adapted to have contact with the collar to break the circuit when the rack bar nearly reaches the end of its movement for operating the armature substantially as described.

2. In a magneto electric machine, the combination with the rotary armature of the vertically sliding toothed rack bar, the pinion geared with the said rack bar, the ratchet wheel connected with said pinion, the master wheel geared with the armature, the pawl connecting the master wheel and ratchet wheel, the tappet arm on the ratchet wheel, and the circuit breaker consisting of the stationary and movable parts normally in contact and connected in the local circuit, and respectively connected with the line wires, the lever connected with the movable part of said circuit breaker and the collar connected with the lever in the relation to the tappet arm for contact of said arm with said collar to break the circuit when the rack bar nearly reaches the end of its movement for operating the armature substantially as described.

Signed at New York city, in the county and State of New York, this 1st day of March, A. D. 1894.

JOSEPH N. McLEOD.

Witnesses:

W. J. MORGAN,
S. H. MORGAN.