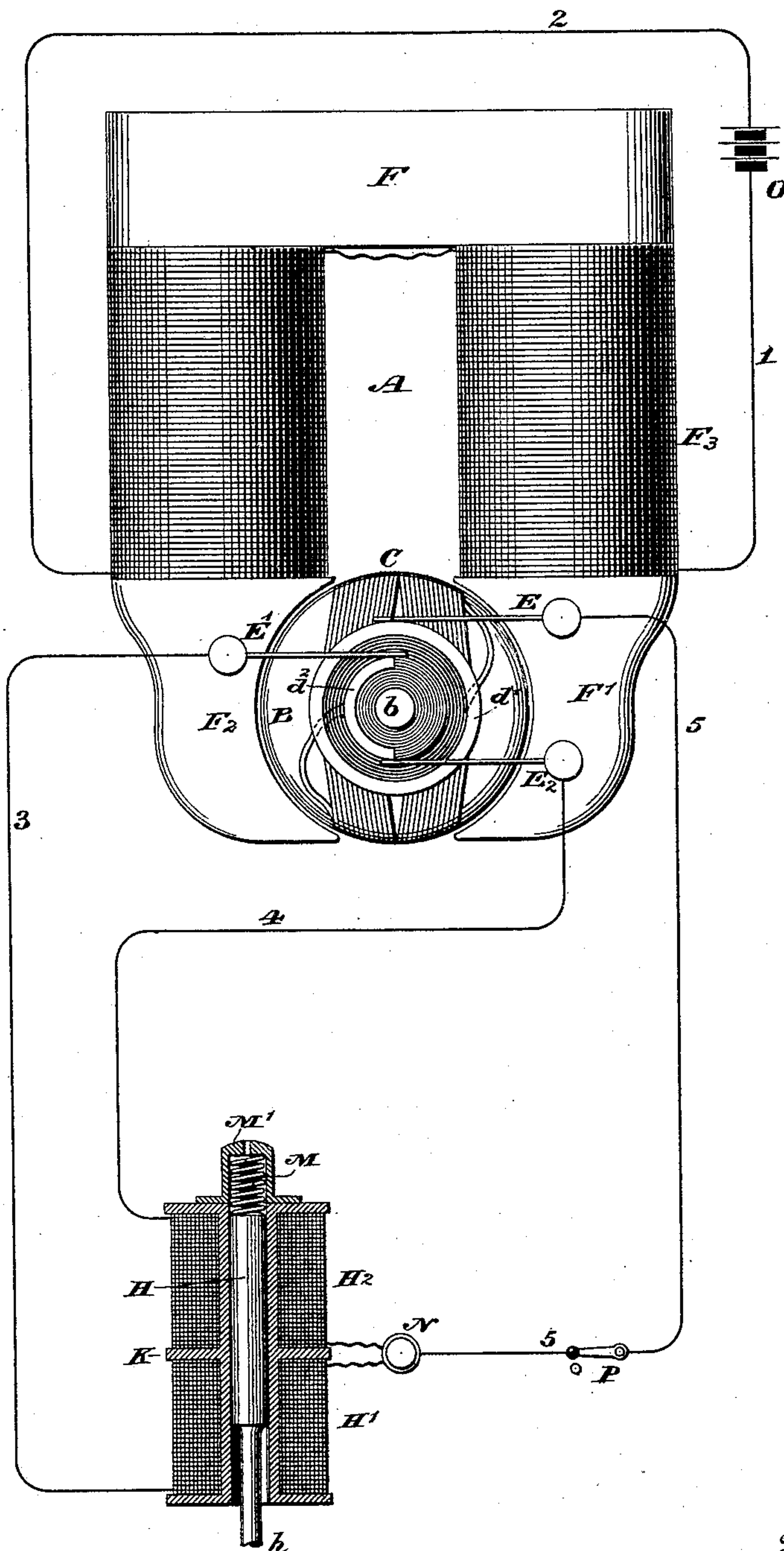


(No Model.)

H. N. MARVIN.
ELECTRIC RECIPROCATING TOOL.

No. 466,541.

Patented Jan. 5, 1892.



Witnesses
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UNITED STATES PATENT OFFICE.

HARRY N. MARVIN, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE MARVIN
ELECTRIC DRILL COMPANY, OF SAME PLACE.

ELECTRIC RECIPROCATING TOOL.

SPECIFICATION forming part of Letters Patent No. 466,541, dated January 5, 1892.

Application filed June 6, 1888. Serial No. 276,184. (No model.)

To all whom it may concern:

Be it known that I, HARRY N. MARVIN, a citizen of the United States, residing in Syracuse, in the county of Onondaga, in the State of New York, have invented certain new and useful Improvements in Electric Reciprocating Tools, of which the following is a specification.

This invention is an improvement in the well-known systems for the operation of electro-magnetic reciprocating tools, the operation of which is effected, first, by the employment of rising and falling currents or pulsations as distinguished from interrupted current impulses of unvarying potential, and, second, by the use of two or more energizing-coils, into which the currents are directed through independent circuits from the generator or source.

The form of tool which I contemplate using is a drilling mechanism for rock, coal, and the like, and as these tools are heavy and large certain mechanical features of construction different from those which appear in such small instruments as dental pluggers and the like are necessary for their practicable and successful operation.

In the special form of generator and drill which I have devised, I have followed the plan described in the Holcombe and Cheever patents, Nos. 235,947 and 235,948, of December 28, 1880, of directing the energizing-currents alternately through the coils of the drill by means of current shifting or commutating devices placed independently of and at a distance from the drill. Furthermore, to avoid the well-known objections to making and breaking a heavy current of unvarying strength and of operating such an instrument as a rock-drill thereby, I have so constructed the generator and commutating devices as to obtain currents of rising and falling potential, securing in this way the advantages incident to the operation of such drills as the well-known Siemens and Halske rock-drill, described in French Patent No. 134,103, December 12, 1879.

Another object of my invention is that by the special construction which I have devised I am enabled to deliver to the drill-coils in

alternation a rising and falling impulse of current.

The invention will be described in detail in connection with the accompanying drawing, which is a diagram showing an end view of the generator and a section of the reciprocating tool.

Referring to the figure, A represents a generator for electric currents. This generator here represented consists of a field-magnet F, provided with two poles F' and F². The field-magnet is energized by means of currents from any suitable source O, connected through the field-magnet coils F³ by means of conductors 1 and 2. This produces opposite polarities in the two poles F' and F². The armature B is carried upon a shaft b and is driven in any suitable well-known manner. It is here shown with one coil only, wound after the manner of a Siemens shuttle-wound armature. Other types of armature may, however, be adopted as found convenient. The respective terminals of the coils C are connected with contact-plates d' and d². The former of these is a continuous ring carried upon the shaft and is provided with a brush E. The latter contact-plate d² occupies a portion only of the periphery of the commutator. In this instance it is shown in the form of a semicircle; but the length may be varied as required in a manner that will hereinafter appear. This plate is provided with two brushes E' and E², and they are at an angle of one hundred and eighty degrees with each other, so that the plate leaves one brush as it comes into connection with the other. It will be evident, therefore, that if the brushes E' and E² be connected with the brush E by different conductors currents will be transmitted through these conductors alternately.

The reciprocating tool consists of a core H, movable to and fro within two solenoids H' and H². These are placed end to end and carried in any suitable frame or support K. The core is provided with an extension h, adapted to carry a rock-drill or a rod connecting therewith, or any suitable instrument according to the purpose to which the invention is to be applied. A buffer or recoil spring M may be applied to the core for the purpose

of receiving the blow upon its reverse movement. As here shown it is carried in a head M' ; but the precise construction is not material. The brush E' is connected by a conductor 3 through the coil H' to a binding-post N. The brush E^2 is connected by a conductor 4 through the coil H^2 to the same binding-post N, and the conductor 5 leads from this binding-post to the brush E. The direction of winding of the coils and the connections with the generator are preferably such that the direction of polarization of the core will always be the same. It will be evident that as the armature of the generator is revolved currents will be transmitted alternately through the solenoids H' and H^2 , and these will drive the core or armature H to and fro with a rapidity dependent upon the rate of movement of the armature. If the plate d^2 occupy one-half the periphery of the commutator, as shown in the drawing, then the reverse movement will commence immediately upon the cessation of the forward movement, and the core will make a complete reciprocation for each revolution of the armature; but by varying the length of this plate the blows may be made more intermittent—that is, separated by any desired interval—and in general the organization of this plate and the brushes applied thereto may be modified, as found convenient for special purposes. A circuit closer or switch P may be included

in the conductor 5 for controlling the circuit connections I.

It is evident that where the invention is applied to a rock-drill, for instance, the instrument may be placed at any desired distance from the generator, as it is necessary only to lead three conductors therefrom, and as the construction of the instrument itself is very simple there is nothing to become out of order, and it does not require skilled labor to control and operate the device.

What I claim is—

A generator for reciprocating tools provided with independent energizing-circuits, consisting in the combination of a field-magnet, a revolving armature, a complete or ring collector forming one terminal of the armature-circuit, a partial ring-collector forming the other terminal, a single brush bearing on the complete ring and two brushes in position to make contact with the collector alternately, and two working circuits, including, respectively, the coils of the drills and leading from the two brushes of one collector to the single brush of the other, as set forth.

In testimony whereof I have hereunto subscribed my name this 4th day of June, A. D. 1888.

HARRY N. MARVIN.

Witnesses:

J. EMMET WELLS,
CAIUS A. WEAVER.