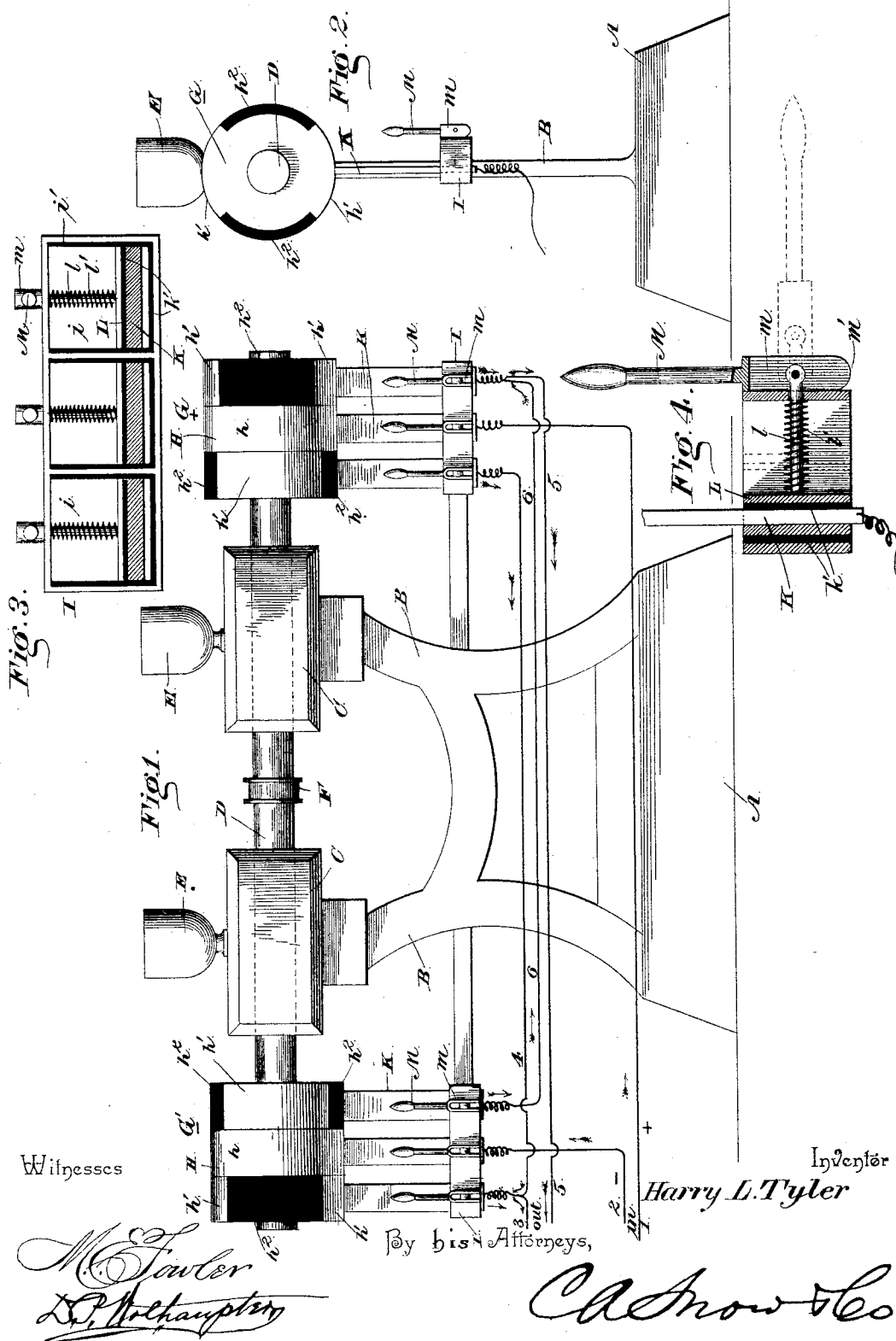


(No Model.)

H. L. TYLER.
CURRENT ALTERNATOR.

No. 476,843.

Patented June 14, 1892.



UNITED STATES PATENT OFFICE.

HARRY L. TYLER, OF CORNING, NEW YORK, ASSIGNOR OF TWO-THIRDS TO
GEORGE W. DRAKE AND CHARLES E. DRAKE, OF SAME PLACE.

CURRENT-ALTERNATOR.

SPECIFICATION forming part of Letters Patent No. 476,843, dated June 14, 1892.

Application filed October 6, 1891. Serial No. 407,957. (No model.)

To all whom it may concern:

Be it known that I, HARRY L. TYLER, a citizen of the United States, residing at Corning, in the county of Steuben and State of New York, have invented a new and useful Current-Alternator, of which the following is a specification.

This invention relates to current-alternators; and it has for its object to provide a translating or alternating machine that is adapted to be operated independently of current-generators, but used in conjunction therewith, the same being designed to be used in connection with any continuous current-generator—such as a battery, dynamo, or other apparatus—and is designed to take the continuous current from such generating source and to produce an alternating current sufficiently powerful for lighting purposes, which alternations are regulated according to the speed of the machine.

A further object of the invention is to do away with the employment of two electrical generators, which are necessary or have been necessarily employed whenever an alternating generator has been successfully used, in such case the current from a continuous generator having been used to excite the fields of said alternator, thus requiring two generators, whereas by the present device an alternation of the current is readily attained when used in connection with any single continuous-current generator.

With these and other objects in view, which will be readily apparent as the nature of the invention is better understood, the invention consists in the novel double and alternately-arranged commutators independently operated and constructed in the novel manner hereinafter more fully described, illustrated in the accompanying drawings, and specifically pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a front elevation of a current-alternator constructed in accordance with my invention. Fig. 2 is an end view of the same. Fig. 3 is a detail view of one of the brush-holder boxes. Fig. 4 is a detail sectional view through one of the compartments of said boxes.

Referring to the accompanying drawings, A represents a suitable base, from which arises

the standard B, provided at its upper opposite ends with the bearings C, which are designed to accommodate the horizontal shaft D, supported and working therein and lubricated by means of the oil-cups E, supported upon the top of said bearings and communicating with the interior thereof. The horizontal shaft D intermediate of the boxes or bearings C is provided with a band-pulley F, by means of which motion is imparted to said shaft from any suitable power, and the shaft carries upon each end thereof the commutator-blocks G and G', respectively. Said commutator-blocks are constructed of any suitable non-conducting material and the requisite sizes adapted for their use and are designed to carry upon their peripheries the contact-plates H. The said contact-plates H upon each of the commutator-blocks G G' comprise the central continuous contact-faces *h* and the segmental contact-faces *h'* upon each side of the continuous central rings and alternately disposed with relation to each other, and those upon one commutator-block being alternately disposed with relation to those of the opposite commutator-block. The ends of the segmental contact-faces on each side of said continuous contact-rings slightly overlap each other, in order that there will be no complete interruption of the current while the same is being alternated, as will be presently apparent, the spaces between the ends of the segmental contact-faces on each side of said ring being separated by segmental strips of insulated contact-face *h*², which provides means for the alternations of the current.

Suitably supported beneath each commutator are the brush-holders I, comprising rectangular boxes having a series of compartments *i*, within which the contact-brushes K are secured and the number of which varies according to the number of segmental contact-faces upon the commutator, which may be varied and placed in the proper circuits to suit the constructor. Each of said compartments is provided with suitable insulation *i'* within the interior thereof and is adapted to receive the followers L, the stems *l* of which extend without the box and are pivotally secured to the lower bifurcated end *m* of the

lever M, which is further provided with the rounded ends m' , which bear upon the top of the holder when the lever draws the plunger out against the tension of the coiled spring l' upon the stem l intermediate of the plunger-head and the side of the box. The said plunger is adapted to normally clamp the contact-brushes K against the rear side of each compartment, and thus hold the same in position, proper insulation k' of course being interposed between the follower and said brushes and the brushes and the rear sides of the boxes, the arrangement of the spring-actuated lever and the followers allowing for the adjustment of said brushes to and from each of the bearing faces or rings of said commutators. The current from the dynamo or other continuous-current generator passes through the positive wire 1 and the central commutator-brush of the farthest commutator G to the continuous central contact ring or face h of said farther commutator, thus distributing the current positively throughout the several contact-faces thereof. Now supposing that the outer contact-brush of the farther commutator G is in contact with one of the outer segmental contact-faces h' while the inner commutator-brush of the same commutator is out of contact with the inner segments or faces h' and upon one of the insulated faces h^2 . The positive current therefore passes through the outer commutator-brush in contact with the segment h' and thence through the wire 5 to the transformer, the tendency of the current to short-circuit over the wire 6, connected with the wire 5 to the inner commutator-brush of the nearer commutator G', being overcome by said inner commutator-brush connected with said wire 6 being in contact with an insulated surface h^2 , and therefore causes the entire positive current to pass over the wire 5 to the transformer. The current returns negatively from the transformer through the wire 3, connected with the outer commutator-brush of the commutator G', which brush is in contact with one of the segmental contact-faces of said commutator, while the inner commutator-brush of the same commutator is in contact with an insulated face, as already described. The negative current will therefore return through the wire 3, the outer commutator-brush of the commutator G' to the central continuous contact-ring h of said commutator, and thence back to the dynamo or generator through the wire 2, connected with the central commutator-brush of the commutator G'. A wire 4 is connected with the wire 3 and the inner commutator-brush of the commutator G; but the tendency of the returning negative current to short-circuit over said wire 4 through the said inner commutator-brush of the commutator G being overcome by said inner commutator-brush traveling over an insulated portion while the outer commutator-brush of the commutator G' is traveling over an uninsulated portion. The position of the commutators just described

causes the current to pass positively to the transformer through the wire 5 and return therefrom through the wire 3. After the commutators have made a quarter-turn, the current is immediately reversed and the same passes positively to the transformer through the wire 3 and returns negatively therefrom through the wire 5, inasmuch as the outer and inner commutator-brushes of each commutator change or reverse the connections to throw the positive and negative current over the opposite wires, as already described. In this position the inner commutator-brush of the commutator G is in contact with one of the inner contact-faces h' , while the outer accumulator-brush of the same commutator is traveling over an insulated portion. The current therefore passes through the wire 4 positively to the wire 3, with which it is connected, thence positively to the transformer, the outer commutator-brush of the commutator G', with which the wire 3 is connected, being out of circuit and upon an insulated face. The current returns negatively through the wire 5, connected with the outer commutator-brush of the farther commutator G; but the said commutator-brush being out of circuit and upon an insulated face the current passes back over the wire 6, connected with the wire 5, to the inner commutator-brush of the commutator G', which is contacting with one of the contact-faces h' of the said commutator. This negative current passes from said inner commutator-brush through the central commutator-brush of the same commutator and back over the wire 2 to the generator. In view of the fact that the ends of each segmental contact-face of each of the commutators slightly overlap each other, it can be readily seen that the inner commutator-brushes have commenced to travel upon the segmental contact-faces after leaving the insulated segments before the outer contact-brushes have left the contact-faces and begun to travel upon said insulated portions, by this means providing means whereby the current will not be for a moment interrupted during the transition of the current from one wire to the other.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a current-alternator, the combination, with a suitable support and bearings, of a shaft journaled horizontally in said bearings and provided with a central pulley, means for operating said shaft, opposite commutators mounted upon each end of said shaft, said commutators being provided with central continuous contact rings or faces, a series of segmental contact-faces joining said central rings and alternately disposed with relation to each other on both sides of the central ring and insulated bearing-faces interposed between the ends of said opposite sets of segmental faces, and of a series of commutator-brushes adjustably supported beneath and in contact

with the several faces of said commutators and connected in circuit with the source of supply and each other to alternately reverse the current over the working wires, substantially as set forth.

2. In a current-alternator, the combination of the opposite commutators mounted upon each end of a shaft independently operated away from the generator, said commutators
10 being provided with central continuous contact-rings, a series of outer and inner segmental contact-faces alternately disposed with relation to each other on both sides of the central ring and joining the same, said faces having
15 their ends projecting beyond the ends of the opposite alternately-disposed face and insulated bearing-faces interposed between the ends of said segmental faces, and a series of commutator-brushes in contact with said central and the inner and outer contact-faces, the
20 central contact-brushes being connected to the generator-wires and said outer contact-brushes being in circuit with the working or distributing wires and with the inner contact-brush
25 of the opposite commutator, so as to reverse

the current over the working wires as the outer and inner brushes are alternately inserted, substantially as set forth.

3. In a current-alternator, the combination, with the commutators, of the brush-holders 30 comprising single rectangular boxes having a series of independent compartments insulated from each other, a spring-actuated follower located within each compartment and provided with an outwardly-extending stem, 35 a bifurcated lever located upon the outside of said holders and pivotally connected with said stems, said lever having rounded bearing ends, and of the contact-brushes adapted to be adjustably clamped between said fol- 40 lowers and the rear insulated sides of said compartments, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HARRY L. TYLER.

Witnesses:

HARRIE J. MILLSPAUGH,
FRED L. PEEK.