

(No Model.)

2 Sheets—Sheet 1.

G. D. BURTON & E. E. ANGELL.
ELECTRIC CONVERTER.

No. 522,506.

Patented July 3, 1894.

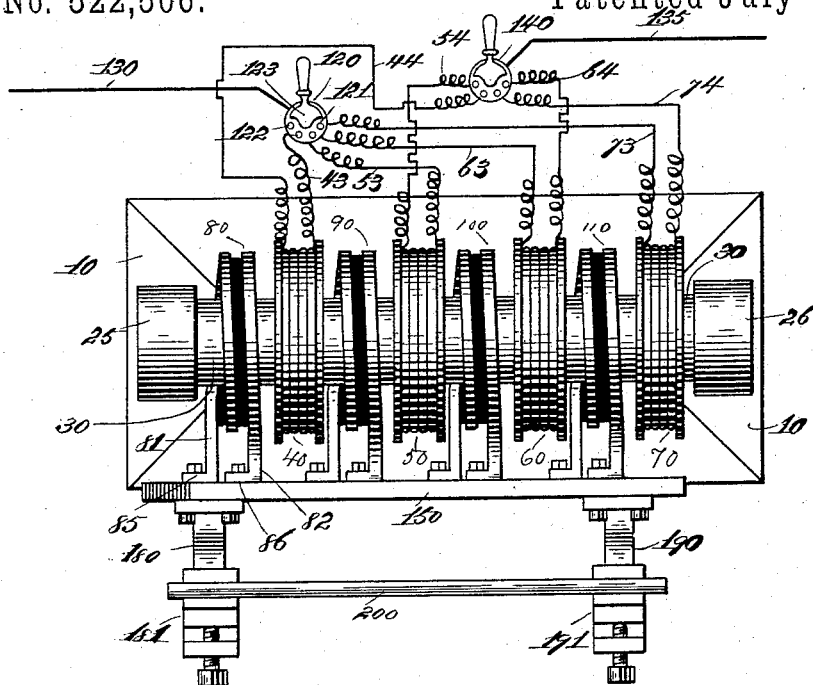


Fig. 1.

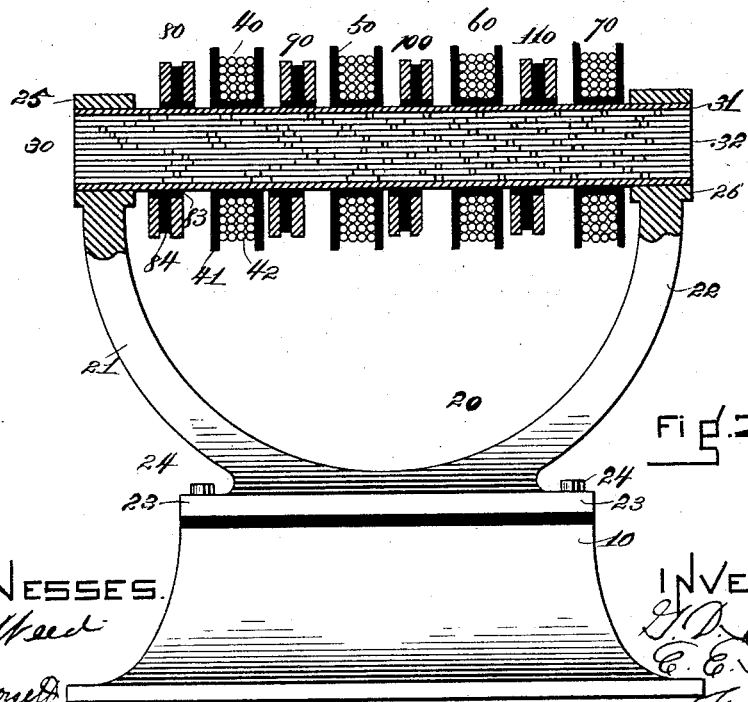


Fig. 2.

WITNESSES.

C. C. Keck
S. M. Gould

INVENTORS.

G. D. Burton
E. E. Angell

J. C. Jones
Attorney.

G. D. BURTON & E. E. ANGELL.
ELECTRIC CONVERTER.

No. 522,506.

Patented July 3, 1894.

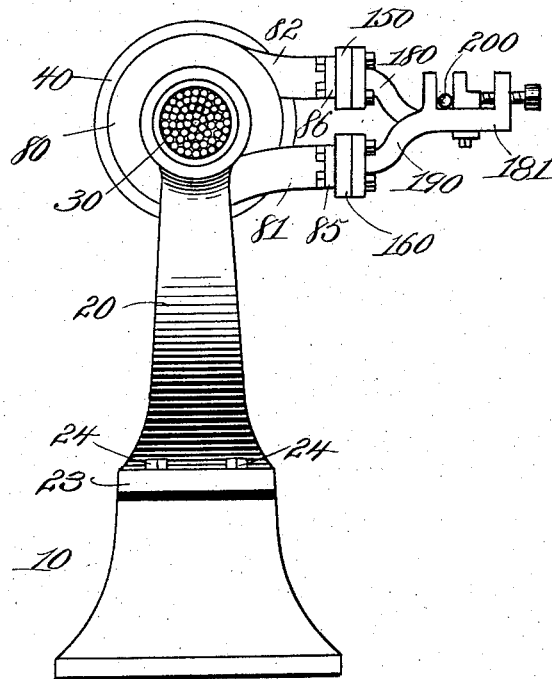


Fig. 3.

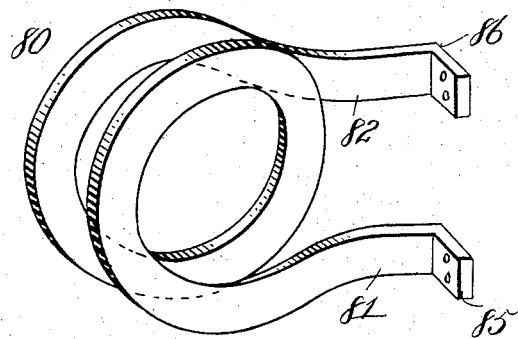


Fig. 4.

WITNESSES.
C. G. Mead
S. M. Howells

INVENTORS
G. D. Burton
E. E. Angell
J. B. Jones
Attorney

UNITED STATES PATENT OFFICE.

GEORGE D. BURTON, OF BOSTON, AND EDWIN E. ANGELL, OF SOMERVILLE,
MASSACHUSETTS, ASSIGNORS TO THE ELECTRICAL FORGING COMPANY,
OF MAINE.

ELECTRIC CONVERTER.

SPECIFICATION forming part of Letters Patent No. 522,506, dated July 3, 1894.

Application filed November 14, 1892. Serial No. 451,947. (No model.)

To all whom it may concern:

Be it known that we, GEORGE DEXTER BURTON, residing at Boston, in the county of Suffolk, and EDWIN ELLIOTT ANGELL, residing at Somerville, in the county of Middlesex, in the State of Massachusetts, citizens of the United States of America, have invented certain new and useful Improvements in Electric Converters, of which the following is a specification.

This invention relates to a converter especially designed for transforming electric currents of small volume and high pressure into currents of low pressure and large volume for metal heating purposes.

The objects of the invention are to secure simplicity of construction and facility in varying the secondary current.

Figure 1 of the accompanying drawings represents a plan of this improved current converter. Fig. 2 represents a side elevation thereof partly in longitudinal section. Fig. 3 represents an end elevation thereof. Fig. 4 represents in perspective one of the secondary coils thereof.

The same reference numbers indicate corresponding parts in the different figures.

A base 10, preferably constructed of wood or other suitable insulating material, may constitute a part of the apparatus.

A frame 20 which supports the core of the converter comprises two standards 21 and 22 which are preferably connected at their lower ends. This frame when constructed in the form shown in the drawings is arc-shaped and semi-circular. It is provided with a flange 23 and is attached to the base by means of bolts 24 passing through said flange. The standard 21 is provided at its upper end with an eye or socket 25 and the standard 22 is provided at its upper end with an eye or socket 26. These eyes are preferably disposed in the same plane opposite each other in alignment.

The core 30 of the converter is supported at its opposite ends in the eyes 25 and 26. This core is preferably composed of a metallic shell 31 and a mass 32 of soft iron wires inclosed in said shell said wires being of dif-

ferent lengths and having their ends overlapped.

The arc-shaped frame 20 is preferably composed of copper or other conductive material and serves as a conductor connecting the opposite ends of the core.

A number of primary coils, as 40, 50, 60 and 70 are disposed on the core 30, and a number of secondary coils as 80, 90, 100 and 110 are also disposed in said case in alternation with the primary coils. Each of the primary coils comprises a spool as 41 of insulating material fitting over the core 30 and an ordinary winding 42 of covered copper wire disposed on said spools. All the positive terminals 43, 53, 63 and 73 of the several primary coils are connected to a switch as 120 which is connected by a conductor or cable 130 to one terminal of the alternating dynamo or other source of primary current, and all the negative terminals 44, 54, 64 and 74 of said primary coils are connected to a switch as 140 which is connected with the opposite terminal of said alternating dynamo or other electric source by a wire or conductor 135.

The switch 120 may be of any suitable construction. In the construction shown it comprises a disk or plate 121 having a series of studs 122 to which the several positive terminals of the primary coils are connected, and a lever 123 pivoted to said plate and adapted to establish electric connection between any one or more of said studs and the conductor 130. The switch 140 is of similar or any suitable construction and the negative terminals of the primary coils are severally connected to the studs thereof and are adapted to be thrown singly or in conjunction into the primary circuit.

Each of the secondary coils consists of a spirally coiled plate of copper or other suitable metal comprising one or more turns on the core and two arms as 81 and 82 extending horizontally therefrom and constituting the terminals of the coil. Each of the coils is insulated from the core by a layer of insulating material 83 composed of paper or any suitable substance and the turns of each coil are insulated from each other by similar insulating

material 84. The arm 81 extends from the lower side of the core and the arm 82 from the upper side thereof. The lower arm has a flange 85 at its outer end and the upper arm has a flange 86 at its outer end. A bar 150, preferably composed of copper, is bolted or otherwise fastened to the several upper arms of the secondary coils and constitutes one pole of the converter, and a similar bar 160 also composed of copper or other suitable conductive material is bolted or otherwise fastened to the outer end of the lower arms of the several secondary coils, and constitutes the opposite terminal of the converter.

A bracket 190 is attached to the upper bar 150 constituting one terminal of the converter and a bracket 180 is attached to the lower bar 160 and extends upward therefrom terminating in the same horizontal plane as the bracket 190. These brackets are disposed near opposite ends of said arms and they are provided at their outer ends with metallic clamps 181 and 191 when used for heating bars of metal. Any other translating device may be placed in connection with the converter.

In the use of this electric converter, an alternating intermittent or pulsatory current is passed through the conductors 130 and 135 in either direction and through the switches 120 and 140. The switches are so adjusted as to include all the primary coils in circuit or to exclude any one, two or more thereof. By adjusting the switches the primary current passing through the converter may be readily controlled and determined and the secondary current thereby regulated. Either of the primary current switches may be turned entirely on to allow the full force of the current to flow through the primary coils from the source of electrical supply, and then the second switch may be used to regulate and vary the voltage and ampèreage in the coils; or where a light current is desired one switch may be turned half way on and the regulation of the current below such standard may be effected by the other switch. The two switches facilitate the regulation of the current. The bar as 200 to be heated is placed in the metal holders or clamps 181 and 191 spanning the space between them and serves as a conductor to close

the circuit and being of greater resistance than the conductors heat is developed in a few seconds sufficiently to soften the bar and adapt it for the forging operation.

We claim as our invention—

1. In an electric converter the combination of two standards provided with eyes at their upper ends, a tubular sheath disposed at its opposite ends in said eyes, iron rods disposed in said sheath, primary and secondary coils disposed on said sheath, the secondary coils having rigid terminal arms and plates connecting said arms of the same polarity.

2. In an electric transformer, the combination of two standards provided with eyes, a core supported at its opposite ends in said eyes, primary coils on said core, and secondary coils on said core having rigid arms constituting opposite poles.

3. In an electric transformer, the combination of two connected standards composed of magnetic material and provided with eyes at their upper ends, a core supported at its opposite ends in said eyes, and primary and secondary coils on said core.

4. The combination of primary circuit conductors, two switches connected with said conductors, a core, primary and secondary coils on said core, all the positive terminals of the primary coils being connected to one of said switches and all of the negative terminals of said primary coils being connected to the other switch, substantially as described.

5. The combination of primary circuit conductors, two switches connected with said conductors, a core, primary and secondary coils on said core, all the positive terminals of the primary coils being connected to one of said switches and all of the negative terminals of said primary coils being connected to the other switch, said secondary coils having horizontal arms constituting terminals, and a positive pole plate attached to one set of said arms and a negative pole plate attached to the other set of said arms, substantially as set forth.

GEO. D. BURTON.
EDWIN E. ANGELL.

Witnesses:

F. R. TIBBITTS,
HORTON RIDEOUT.