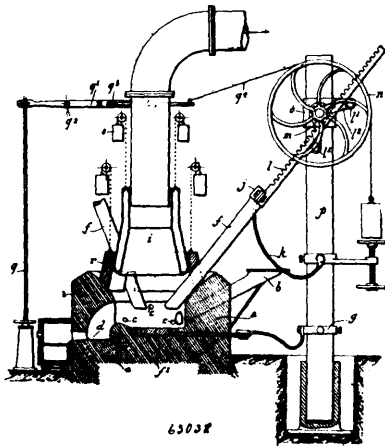


supported on said hand wheel and a nut working on the screw at the upper end of said valve stem and in contact with said washer, as set forth. 3rd. In a valve the combination of a valve body having an upper and a lower part, separated by a diaphragm, said lower part having internal annular projections and said upper part having an internal annulus, also having diametrically opposite channels, said diaphragm having an upwardly projecting lug, a gate screwing into said annulus and seating on the under side thereof, said gate being provided with a socket, a valve stem fitting in said socket and having a packing ring plate provided with a lug, adapted to engage with a lug on the diaphragm, a packing ring, a screw ring connecting said packing ring with the packing ring plate, a union sleeve seating on the annulus in the upper part of the valve body and having a conical recess on said packing ring seats, also having lugs working in channels in the valve body, a hand wheel fitting on the upper end of the valve stem and provided with a plate against which the upper end of the union sleeve abuts, a dished washer on said hand wheel, a nut on the valve stem working against said washer and a nut in the valve body bearing on said union sleeve, as set forth.

No. 63,038. Electric Furnace. (*Fournaise électrique.*)



Charles Bertolus, St. Etienne, Loire, France, 9th May, 1899; 6 years. (Filed 3rd September, 1897.)

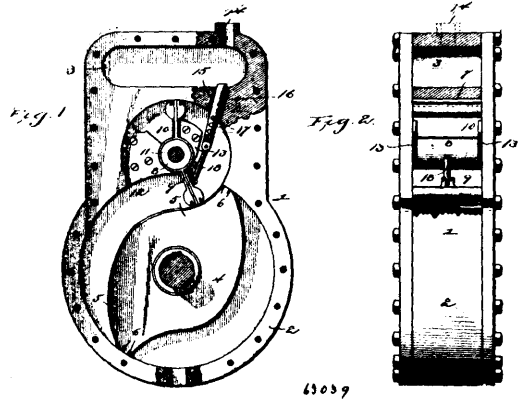
Claim.—1st. The hereinbefore described method of utilizing polyphase currents of any number of phases in electric furnaces, for treating, fusing and decomposing materials by the voltaic arc, said method consisting in supplying any number of phase currents to a corresponding number of electrodes and in striking the arcs either directly between each of the electrodes through the material to be treated or between each of the electrodes and the mass to be treated, this latter being then connected to a point of the polyphase system. 2nd. The electric furnace above described, adapted for the application of polyphase currents to processes of fusion and decomposition of materials by the voltaic arc, and at the same time suitable for using alternating monophase currents, and even continuous currents, the said furnace comprising masonry foundation *a*, shoots *b*, hollow (such as *d*) separated from the hearth proper by a bridge (such as *c*), inclined electrodes dipping into the cavity of the furnace at an angle and capable of individual and simultaneous adjustment by means of suitable controlling gear, dampers (such as *r*) and movable chimney (such as *i*), all arranged and operating, substantially as set forth.

No. 63,039. Rotary Engine. (*Machine rotatoire.*)

Elton Preston Kendall, Fairlee, Henry M. Dufur, Waterbury, George A. Dickey, Bradford, and Charles F. Smith, West Topsham, all in Vermont, U.S.A., 9th May, 1899; 6 years. (Filed 28th December, 1898.)

Claim.—1st. In a rotary engine, the combination of a casing having a cylinder and a communicating abutment seat, a winged piston mounted in the cylinder, an oscillatory balanced abutment mounted in said abutment seat and having a wing arranged in operative relation with the piston, and in the path of the piston wing for displacement thereby, and yielding abutment-operating means for extending the abutment wing after each displacement by a piston wing and controlling cylinder feed ports through which motive agent is admitted to the abutment seat in advance of the operative abutment wing, substantially as specified. 2nd. In a rotary engine, the combination of a cylinder and a communicating abutment seat, a winged piston mounted in the cylinder, an oscillatory abutment having oppositely located operative and balancing rings of approximately equal areas, the operative abutment wing being arranged in the path of the piston wings for displacement thereby, and a reciprocatory abutment operating member exposed to a constant yielding pressure, for extending and maintaining the operative wing in its normal position

and controlling cylinder feed ports, substantially as specified. 3rd. In a rotary engine, the combination with a cylinder and a



communicating abutment seat, of a winged piston arranged in the cylinder, an oscillatory winged abutment arranged in the abutment seat and having approximately co-extensive operative and balancing wings simultaneously exposed to fluid pressure, the operative abutment wing being arranged in the path of the piston wings for displacement thereby, and a slide valve permanently exposed to fluid pressure, connected with the oscillatory abutment for normally maintaining the same in its operative position, and controlling cylinder feed ports, substantially as specified. 4th. In a rotary engine, the combination with a cylinder and a communicating abutment seat, of a winged piston arranged in the cylinder, an oscillatory winged abutment arranged in the abutment seat and having approximately co-extensive operative and balancing wings simultaneously exposed to fluid pressure, the operative abutment wing being arranged in the path of the piston wings for displacement thereby, and a hollow slide valve connected with the abutment and fitted in an inlet port for the communication of motive agent to the abutment seat, said slide valve having a lateral feed port for closure by the axial movement of the valve, substantially as specified. 5th. In a rotary engine, the combination with a cylinder and a communicating abutment seat, of a winged piston arranged in the cylinder, an oscillatory winged abutment arranged in the abutment seat and having approximately co-extensive operative and balancing wings simultaneously exposed to fluid pressure, the operative abutment wing being arranged in the path of the piston wings for displacement thereby, and a hollow slide valve fitted in an inlet port and connected with the abutment, said valve having a head exposed to the constant pressure of motive agent admitted through the inlet port, and provided with a lateral feed port for closure by the walls of the inlet port when the valve is moved axially, substantially as specified. 6th. In a rotary engine, the combination with a cylinder and a communicating abutment seat, of a winged piston arranged in the cylinder, an oscillatory winged abutment arranged in the abutment seat and having approximately co-extensive operative and balance wings simultaneously exposed to fluid pressure, the operative abutment wing being arranged in the path of the piston wings for displacement thereby, and a hollow slide valve fitted in an inlet port in communication with said abutment seat and flexibly connected with the abutment, said slide valve having a head permanently exposed to the constant pressure of motive agent admitted through the inlet port and provided with a longitudinal series of feed ports, for successive closure by the walls of the inlet ports as the valve is moved axially, substantially as specified. 7th. In a rotary engine, the combination of a casing having a cylinder, a communicating abutment seat, and an inlet port in communication with the abutment seat, a winged rotary piston mounted in the cylinder, a winged abutment mounted for oscillation in the abutment seat and having oppositely extending approximately co-extensive wings, of which one is arranged in operative relation with the piston, a hollow slide valve fitted in said inlet port and provided with a plurality of feed ports arranged in longitudinal series, for successive closure and exposure by the opposite reciprocatory movements of the valve, and connections between the abutment and said valve, substantially as specified. 8th. In a rotary engine, the combination with a casing having a cylinder and a communicating abutment seat, a winged piston mounted in the cylinder, a winged abutment mounted in the abutment seat, and a feed valve operatively connected with the abutment and having a plurality of spaced feed ports arranged parallel with the direction of movement of the valve, said feed ports being adapted for successive closure and exposure during movements of the valve in opposite directions, the piston having a gradual cam face for actuating the abutment to impart movement to the feed valve, substantially as specified. 9th. In a rotary engine, the combination of a casing having a cylinder and a communicating abutment seat, and also having an inlet port communicating with the abutment seat, a winged piston mounted in the cylinder, an oscillatory abutment mounted in the abutment