(No Model.)

T. PARKER.

ELECTRICAL FURNACE.

No. 482,586. Patented Sept. 13, 1892.

FIG. 1.

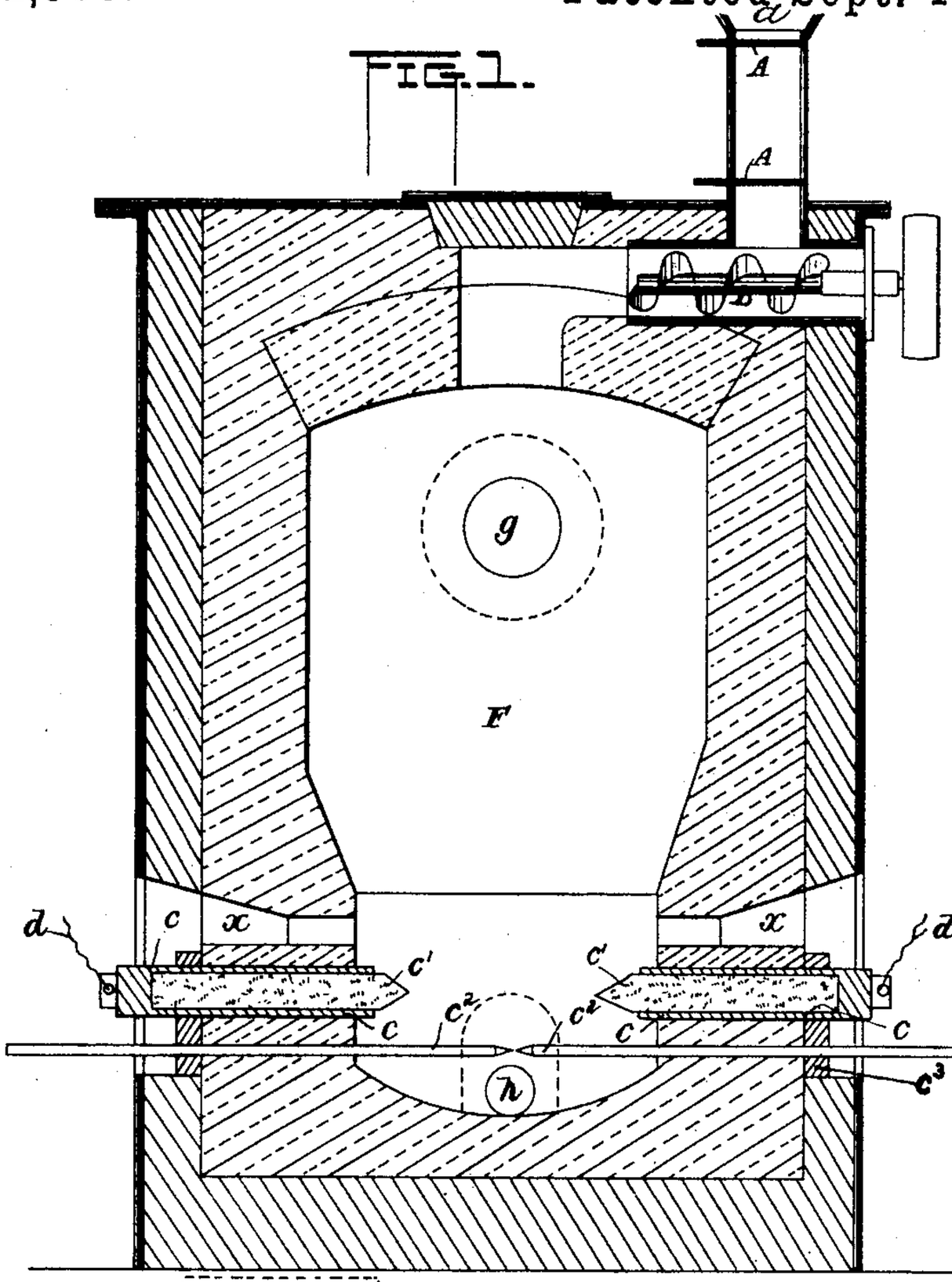
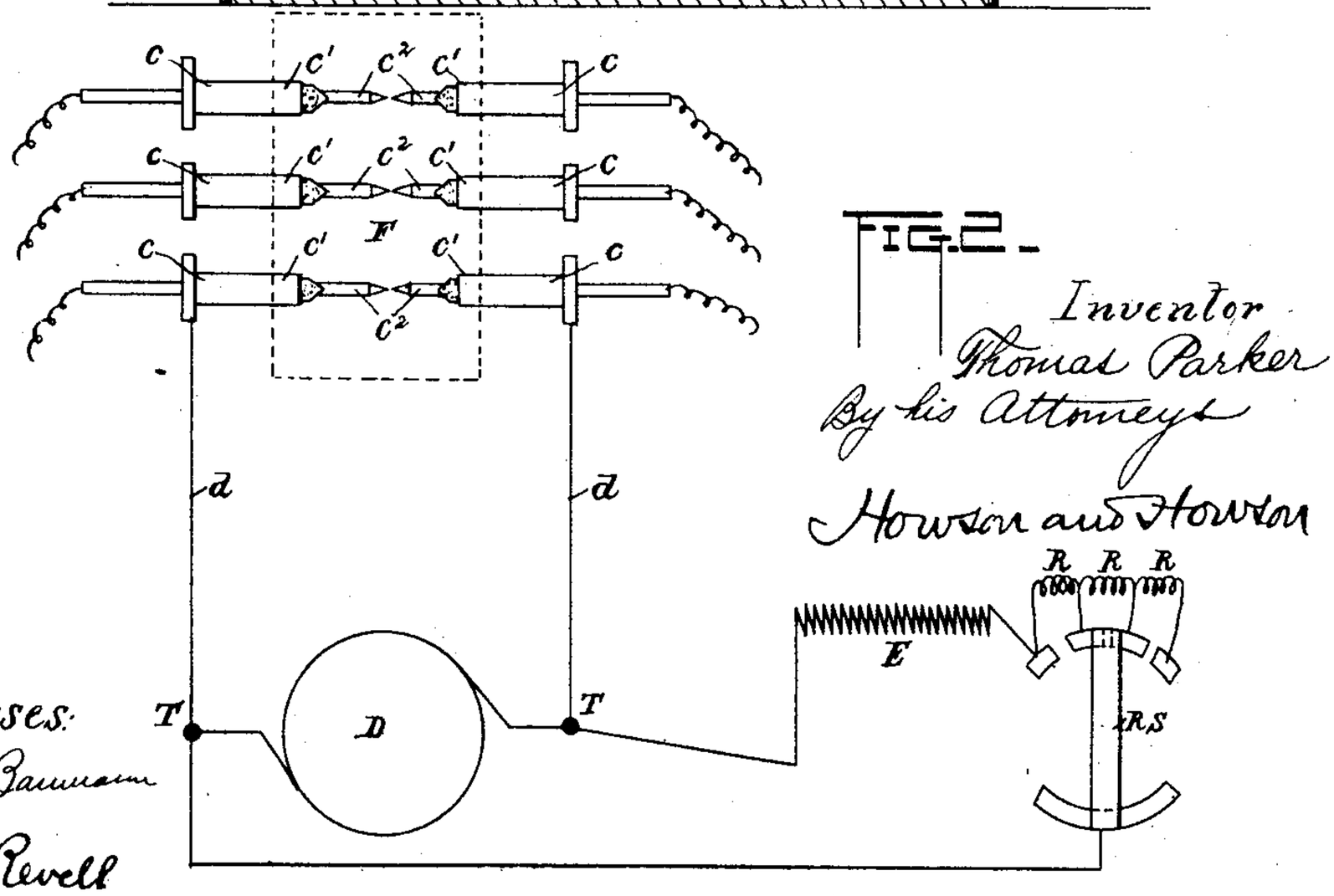


FIG. 2.



Witnesses:
George Baumann
John Revell

Inventor
Thomas Parker
By his Attorneys
Howson and Howson

UNITED STATES PATENT OFFICE.

THOMAS PARKER, OF NEWBRIDGE, ENGLAND, ASSIGNOR TO THE ELECTRIC CONSTRUCTION CORPORATION, LIMITED, OF SAME PLACE.

ELECTRICAL FURNACE.

SPECIFICATION forming part of Letters Patent No. 482,586, dated September 13, 1892.

Application filed July 5, 1890. Serial No. 357,826. (No model.) Patented in England October 29, 1889, No. 17,060; in France June 23, 1890, No. 206,566; in Germany June 27, 1890, No. 55,700, and in Italy October 23, 1890, No. 431.

To all whom it may concern:

Be it known that I, THOMAS PARKER, electrician, a subject of the Queen of Great Britain and Ireland, residing at Newbridge, Wolverhampton, in the county of Stafford, England, have invented certain Improvements in and Connected with Electrical Furnaces and their Manipulation, (for which I have obtained patents in Great Britain, No. 17,060, dated October 29, 1889; in Germany, No. 55,700, dated June 27, 1890; in France, No. 206,566, dated June 23, 1890, and in Italy, No. 431, dated October 23, 1890,) of which the following is a specification.

According to my invention, instead of using movable electrodes of metal or carbon, I use blocks, cylinders, or equivalent pieces of carbon, secured in position in the walls of the furnace opposite to each other and set at suitable distances apart in the interior of the furnace wherein it is intended to treat the materials at the high temperature of the electric arc or incandescence due to the current. These blocks, if they be of carbon, are preferably fixed in metal conductors, which conductors or the electrodes themselves, if they be of metal, may be kept cool by a circulation of water within them. These blocks, cylinders, or the like will be fixed while the furnace is running, only needing to be pushed farther into the furnace to compensate for wear. Rods of metal or of carbon are used to establish the electric circuit through the furnace, and these rods may be passed through holes through the walls of the furnace. In starting the electric furnace, when charged and required to be run, the said rods of carbon or other conductor are pushed from each side to meet in the center of the furnace, and through these rods a current of electricity is passed, which creates a high state of incandescence, and thereby establishes a passage for the current in the mass of material in the furnace. Thereafter the rods so used to establish the circuit may be allowed to remain, or they may be drawn outward without being entirely removed. The varying resistance of the material within the furnace during treatment is met or compensated by varying the electro-motive force across the furnace, which may be done by an automatic arrangement acting upon the magnets of the exciting-machines in case of alternating currents being used or upon the main magnets in case of continuous currents being used. This automatic arrangement may be regulated so that the quantity of current may be controlled at will across the furnace and any increase or decrease of resistance in the charge in the furnace is at once met. An aperture or apertures is or are left in the sides of the furnace, so that the material may be manipulated between the electrodes in the interior of the furnace during the work. Any materials which can be treated in electric furnaces may be treated in this furnace.

The electric current employed in this furnace may be either a continuous or an alternating current, the latter being preferred.

The accompanying drawings will serve to illustrate the manner in which my invention may be carried into effect.

Figure 1 is a vertical section of the furnace, and Fig. 2 is a diagram to illustrate the means for regulating the electro-motive force or quantity of current across the furnace.

F is the furnace containing the charge to be treated. It has an inlet-hopper at *a*, with slides A A, by which the charge can be admitted without opening communication between the interior of the furnace and the outer air.

B is a screw conveyer by which the charge is pushed forward into the furnace.

c' c' are the electrodes, consisting of blocks or cylinders or the like of carbon fixed in metal socket-pieces *c c*, to which the electric-circuit wires *d* from the dynamo D are affixed. The current, as aforesaid, may be either continuous or alternating. c^2 c^2 are rods of metal or carbon, which are used to establish the electric circuit through the furnace, the said rods being inserted into holes in conductors c^3 (in contact with the socket-pieces *c*) and in the furnace, as shown.

g is the outlet for the gas or vapor, *h* the slag-tap hole, and *x* the opening for manipulating the charge, the said openings being closed by clay or otherwise when the furnace is at work.

I use coke or other form of carbon in the charge between the electrodes c', the said coke being in contact with the said electrodes, so that complete incandescence is insured.

A means for varying the electro-motive force or quantity of current across the furnace with the varying resistance of the charge is illustrated by the diagram, Fig. 2. c' c^2 indicate the electrodes in the furnace, as in Fig. 1, and D is the dynamo and T its terminals. E represents the exciting-circuit. R R are resistances, and R S is the resistance-switch, which is operated to put in more or less resistance at R as the resistance of the charge in the furnace lessens or increases. This switch may be automatically operated, and a suitable arrangement for the purpose is a current-regulator such as is described in the specification of English Letters Patent No. 14,504, of September 14, 1889, granted to William Henry Douglas and Thomas Hugh Parker.

The furnace may be worked with a quantity of molten metal or conductive material in the lower part of the furnace to distribute the heat. The carbons or electrodes can be readily removed and replaced when desired. In order to maintain the electrodes in working order when they are of carbon, fine or divided carbon may be introduced by the openings x into the furnace over the exposed ends of the electrodes.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

In an electric furnace, a strip or bar of conducting material on each of two opposite sides of the furnace, each strip or bar having therein two sets or series of holes corresponding to similar holes in the walls of the furnace, one set of holes being above the other set and fitted with metallic sockets holding stationary electrodes, in combination with adjustable rods of metal or carbon fitted in the lower set of holes for the purpose of striking the arc when commencing to work the furnace, substantially as hereinbefore described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS PARKER.

Witnesses:

ALFRED EDWARD ROBINSON,
54 *St. Mark Street, Wolverhampton.*

HENRY DUNN,
Francis Street, Wolverhampton, Clerk.