

No. 839,983.

PATENTED JAN. 1, 1907.

W. H. BRISTOL.
ELECTRIC FURNACE.
APPLICATION FILED AUG. 6, 1906.

Fig. 1.

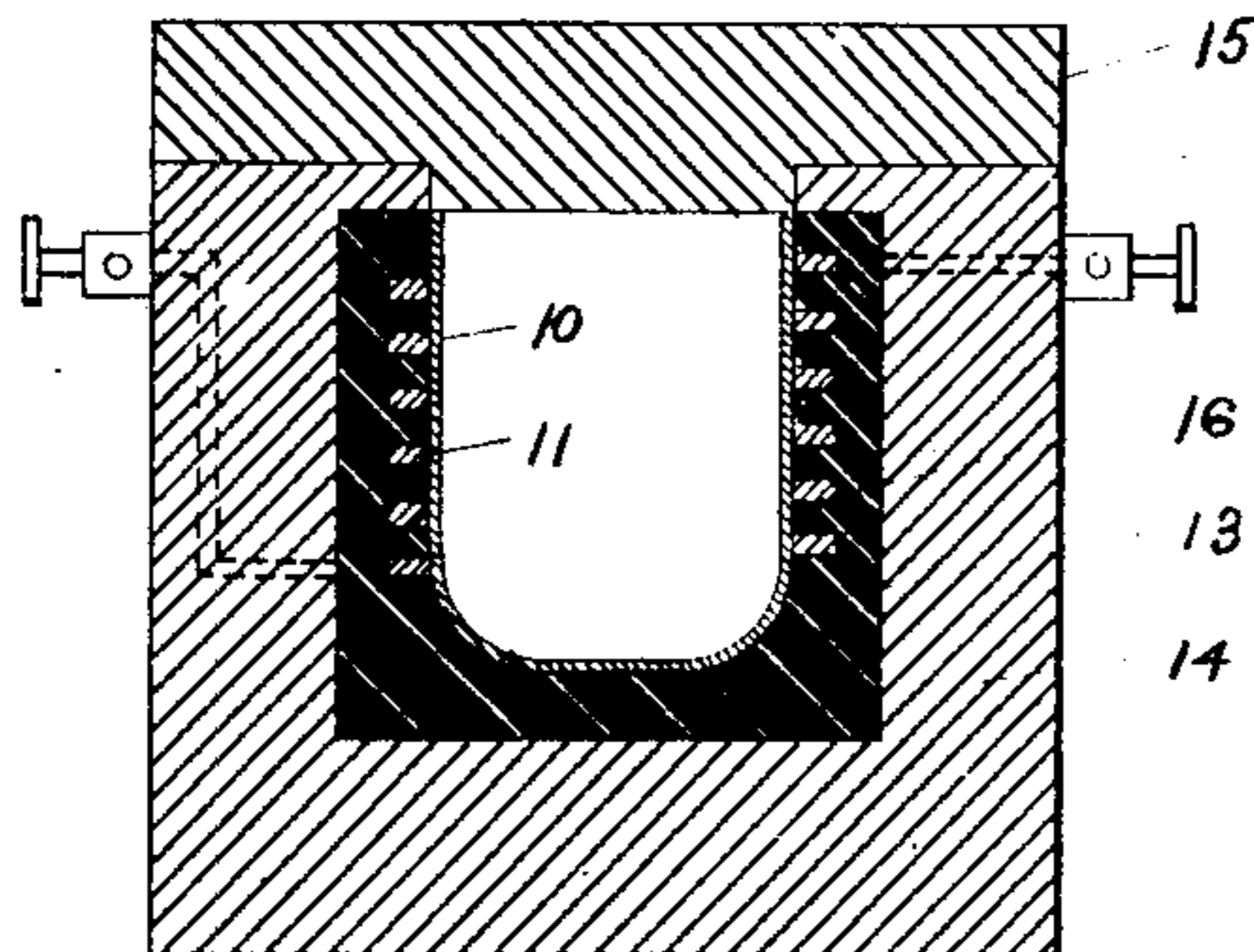
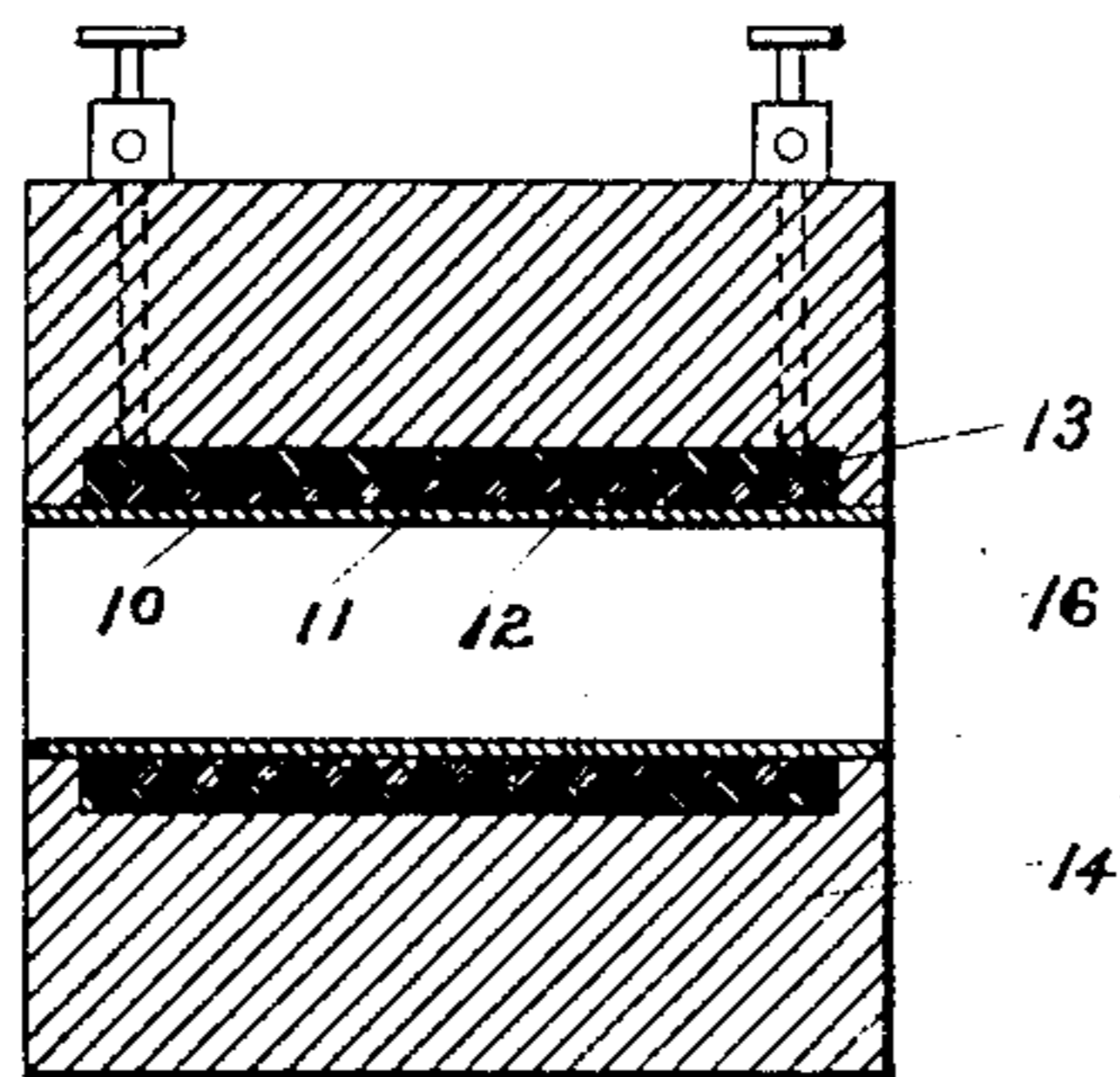


Fig. 2.



Witnesses
G. Wm. Eisenbaum
Sally C. Yudofsky.

William H. Bristol Inventor
By his Attorney Fred P. Schuch

UNITED STATES PATENT OFFICE.

WILLIAM H. BRISTOL, OF NEW YORK, N. Y.

ELECTRIC FURNACE.

No. 839,983.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Application filed August 6, 1906. Serial No. 320,334.

To all whom it may concern:

Be it known that I, WILLIAM H. BRISTOL, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electric Furnaces, of which the following is a specification.

My invention relates to electric furnaces, and particularly to that type of furnace heated by means of the electricity passing through a heating-coil of suitable resistance-wire.

It has for its object a furnace which may be quickly brought to full heat; also, a furnace into which the articles may be placed without danger of short-circuiting or contaminating the heating-coil.

For this purpose my invention consists, essentially, of an electric furnace comprising a fused-quartz (silica) receptacle forming a heating-chamber, an electric heating-coil about said receptacle, and a refractory non-conducting material or materials incasing said coil and chamber.

The nature of my invention will best be understood in connection with the accompanying drawings, in which—

Figure 1 is a vertical section of a crucible form of furnace. Fig. 2 is a transverse section of a tubular form of furnace.

Similar characters of reference designate corresponding parts throughout both views.

The present furnaces of this character utilize some refractory lining or crucible of magnesia or clay as a heating-chamber, into which the articles or materials to be treated are placed. Crucibles or chambers so formed are provided with starting resistances and considerable time (some ten to fifteen minutes) is required to bring the furnace up to a full heat. This is necessary to avoid cracking of crucible or lining. Also, especially with the lined heating-chambers, the articles or materials to be heated frequently permeate said lining or crucible and short-circuit or attack the heating-coil, causing it to break down.

In my improved furnace I provide a heating-chamber formed of fused quartz (silica) in the shape of a crucible 10, Fig. 1, or a tube, Fig. 2, or of any form suited to the use to which the furnace is to be put. About this chamber is a heating-wire 11, preferably of platinum, in the form of a coil and of suitable size to produce the required heat and of such

resistance as to permit of its being directly placed across a predetermined difference of potential. The successive turns of the coil are by preference insulated from each other by an asbestos cord 12, wound on together and parallel with the platinum wire, Fig. 2.

For the purpose of permitting a considerable amount of resistance-wire to be wound upon the quartz receptacle within a contracted space and in order to allow of the passage of sufficient current to produce the quantity of heat demanded I may make the said wire of flattened form and wind it edge-wise with respect to said receptacle, as shown in Fig. 1. By this means I am enabled to wind on wire of sufficient cross-section to carry the required current.

The quartz crucible or tube, with its surrounding coil, is preferably covered with asbestos 13 and the whole then incased in some refractory insulating material 14, as fire-clay, magnesia, &c., to prevent radiation. A suitable refractory cover 15 is provided when required.

The articles or materials to be heated are placed within the heating-chamber 16 and the full current sent through coil 11. The chamber 16 heats very rapidly, coming to a full heat in about one minute and a half. Owing to the peculiar property of the quartz, the crucible or lining does not crack under the sudden changes of temperature, and the heat may be quickly turned on or off without danger of cracking the quartz receptacle. The quartz also acts as a first-class insulator, and there is no danger of the articles or materials short-circuiting the heating-coil 11 or of penetrating the receptacle to contaminate said coil. Of course substances which combine with the silica at the high temperatures employed must not be placed in direct contact with the walls of the heating-chamber.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. An electric furnace comprising: a fused-quartz receptacle forming a heating-chamber; an electric heating-coil surrounding the same; and a refractory, non-conducting material incasing said coil and chamber.

2. An electric furnace comprising: a fused-quartz receptacle forming a heating-chamber; a platinum electric heating-coil surrounding the same; and a refractory, non-conducting covering surrounding said coil and chamber.

3. An electric furnace comprising: a fused-

quartz receptacle forming a heating-chamber; a platinum electric heating-coil wound upon the same having its successive turns separated from each other by an asbestos cord; and a refractory, non-conducting covering surrounding said coil and chamber.

4. An electric furnace comprising: a fused-quartz receptacle forming a heating-chamber; a coil of flattened wire placed edgewise with respect to the quartz receptacle and surrounding the same; and a refractory, non-conducting covering surrounding said coil and chamber.

5. An electric furnace comprising: a fused-quartz receptacle forming a heating-chamber; an electric heating-coil surrounding the same; an asbestos covering about said recep-

tacle and coil; and a refractory, non-conducting material incasing the same.

6. An electric furnace comprising: a fused-quartz receptacle forming a heating-chamber; an electric heating-coil surrounding the same, having its successive turns separated from each other by asbestos; an asbestos covering about said receptacle and coil; and a refractory, non-conducting material incasing the same.

Signed at New York, in the county of New York and State of New York, this 4th day of August, A. D. 1906.

WILLIAM H. BRISTOL.

Witnesses:

FREDK. F. SCHUETZ,
SALLY O. YUDIZKY.