(No Model.)

J. S. SELLON.

MANUFACTURE OF CARBONS FOR INCANDESCENT ELECTRIC LAMPS.

No. 411,474. Patented Sept. 24, 1889.

FIG - 1 -

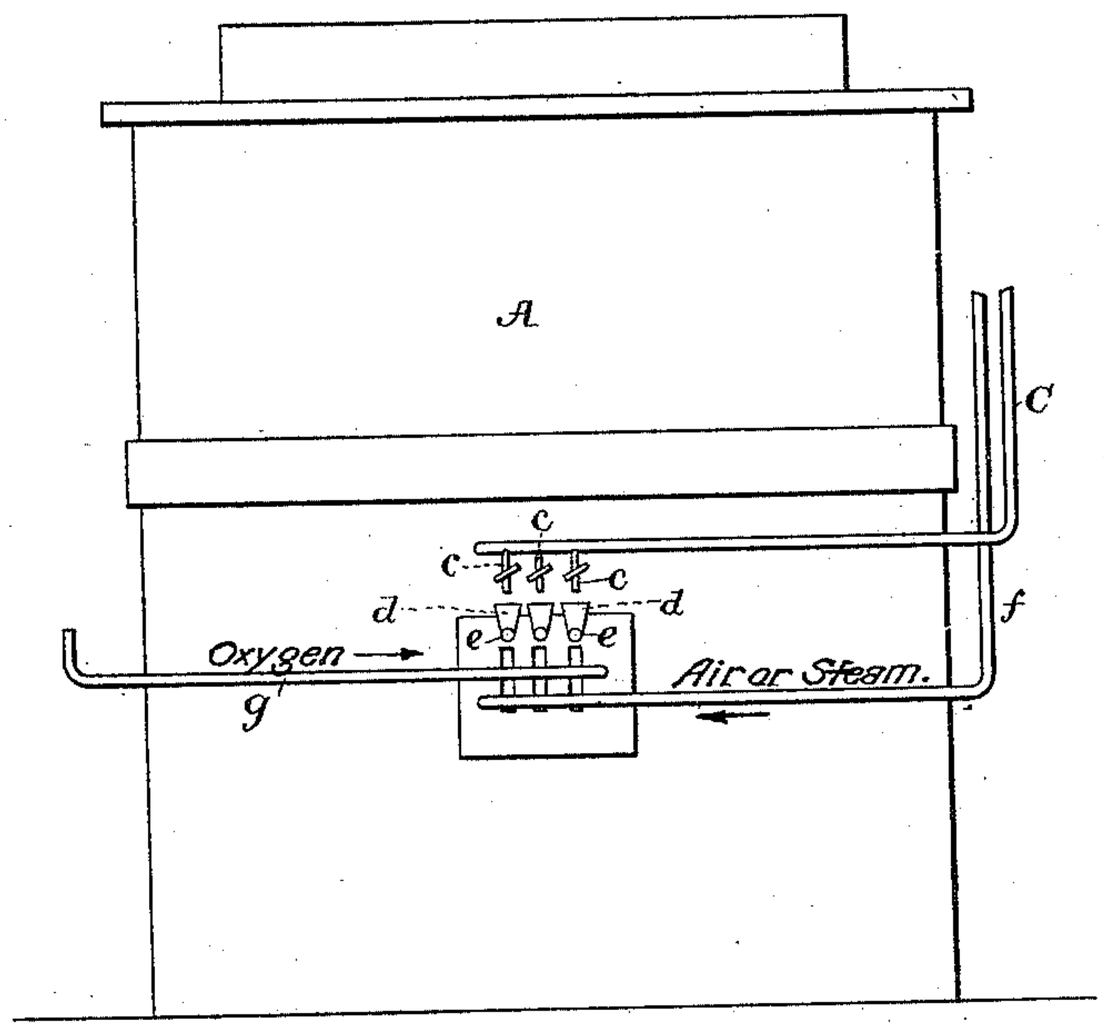
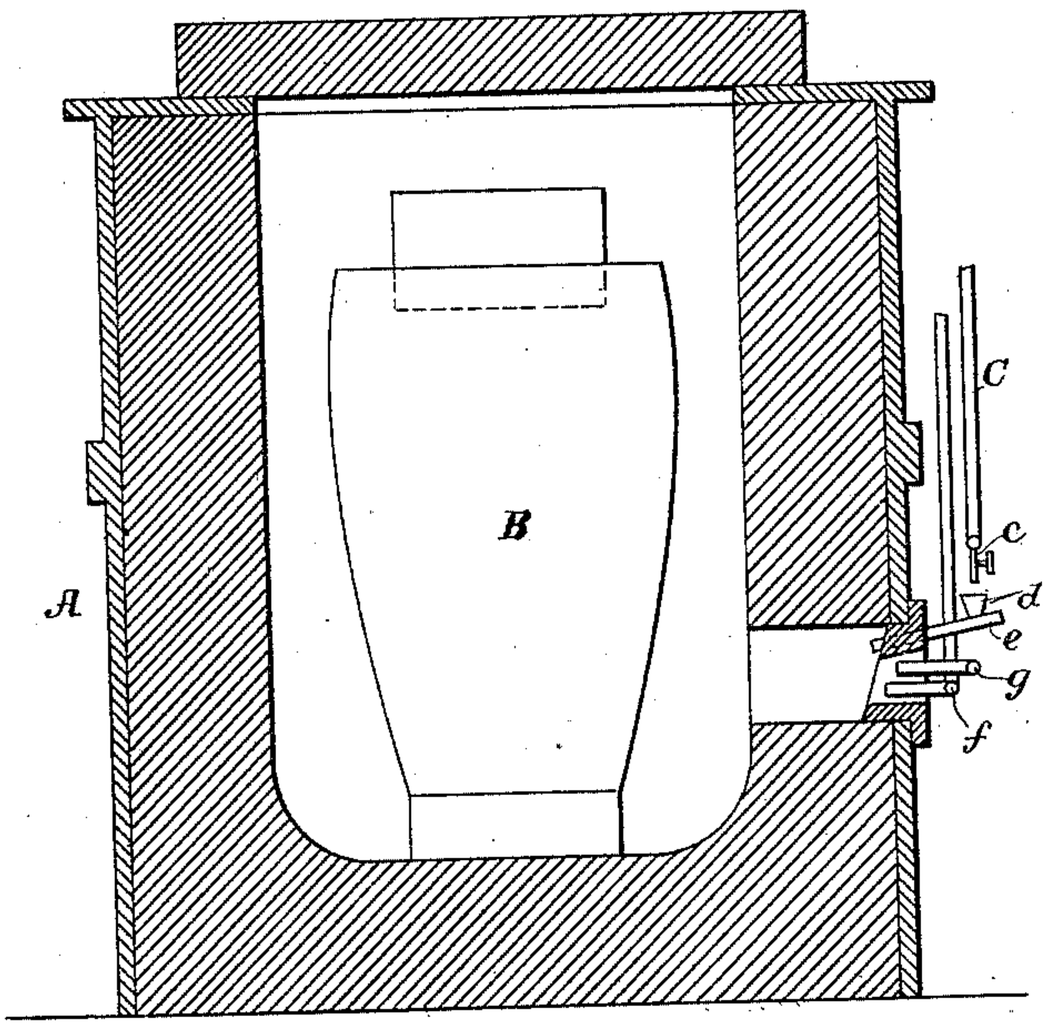


FIG - 2 -



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UNITED STATES PATENT OFFICE.

JOHN S. SELLON, OF HATTON GARDENS, COUNTY OF MIDDLESEX, ENGLAND.

MANUFACTURE OF CARBONS FOR INCANDESCENT ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 411,474, dated September 24, 1889.

Application filed January 23, 1889. Serial No. 297,330. (No model.) Patented in England August 15, 1888, No. 11,749.

To all whom it may concern:

Be it known that I, JOHN SCUDAMORE SELLON, gentleman, a subject of the Queen of Great Britain, residing at Hatton Gardens, in the county of Middlesex, England, have invented certain Improvements in the Manufacture of Carbons for Incandescent Electric Lamps, (for which I have applied for a patent in Great Britain, No. 11,749, dated August 15, 1888,) of which the following is a specification.

My invention has for its object the obtaining a dense and homogeneous carbon for use in incandescent electric lamps.

Heretofore the carbonizing process has been carried on by heating the packed carbons or filaments in coal or coke fires, the carbons being usually inclosed in crucibles of plumbago or other refractory material and heated by surrounding such crucible with coal or coke, sometimes employing an air-blast to increase the heat. When heated in such a manner, however, the heat cannot be raised to the high degree of intensity which is necessary to produce the compactness of texture and the homogeneity desirable to insure the uniformity, durability, and full efficiency of the carbons or filaments, and to prevent the blackening of the globes of the lamps by disintegration of the carbon by the electric current, and it has been a usual practice to deposit upon filaments so prepared, especially when made of parchmentized thread in which irregularities unavoidably occur, a coating of carbon by passing an electric current through them while they are surrounded by a hydrocarbon gas. Filaments or carbons so prepared have the defect of not being homogeneous throughout, the core being comparatively soft, porous, non-durable, and inefficient, while the outside coating or jacket is inelastic and hard and of a character entirely different from that of the core. Consequently there is unequal expansion and contraction between the core and the coating, and therefore great liability to break or crack when in use and to deteriorate rapidly at the points of inequality.

By heating carbons or filaments (especially those of a non-structural character, such as are manufactured from properly-prepared gelatinous cellulose,) as hereinafter described, to a very high degree of heat over and beyond that obtainable by heating by means of coal or coke, as aforesaid, filaments are obtained of extreme compactness, hardness, and evenness, and of a quality as to efficiency, durability, and non-blackening of the globes superior to that of the carbons or filaments produced as aforesaid; but the necessary degree of heat cannot be attained in the presence of coke or coal, as such fuel at so high a temperature (even if attainable) as is required clinkers upon and attacks any crucible which can be used, ultimately fluxing or fusing it down and destroying its contents. I therefore according to my invention employ for the purpose a suitably-constructed furnace, in which I burn, preferably, what is generally known as "heavy oil," or I may use petroleum or any suitable oil or oily compound with the addition of a blast of air or steam and with or without the further application of oxygen; or I may employ a mixture of oxygen and other suitable gas—such as coal-gas—by the use of which heating agents the crucibles and their contents are practically preserved from injury, and can be raised to a degree of heat which is otherwise unattainable without bringing about their destruction. I prefer to use two crucibles—one inside the other—with a layer of graphite or carbon powder between them, the inner crucible containing the filaments carefully packed in the usual manner.

It has not been found possible with coal or coke to obtain in the crucible a temperature as high as 3,000° Fahrenheit, and it is necessary, in order to produce the result attained by the present invention, to subject the filaments to a temperature above that specified, which may be regarded as the minimum limit. In practice I usually employ a temperature of 3,300° Fahrenheit, and increase it considerably above that point toward the close of the operation by the use of oxygen.

The accompanying drawings show in front elevation, in Figure 1, and in vertical section, in Fig. 2, a furnace arranged for the purposes of my invention as applied to burning oil in conjunction with a blast of air or steam with or without the additional application of oxygen.

A is the furnace, in which is placed the

packed crucible B, with a cover luted on in the usual manner, or preferably with an inner crucible packed with filaments and embedded in carbon in the outer crucible.

C is a pipe, through which oil flows from an overhead tank through the valves *c* drop by drop, or in a thin continuous stream into the funnels *d*, by which it is led into the pipes *e*, at the nozzles of which it is ignited and burns inside the furnace. A blast of air or steam is supplied by a pipe *f*, and issues with the oil at the points of ignition. The oxygen is generally used for a short period only toward the end of the operation, in order to finish up with the most intense heat possible, and is applied by means of a tube *g*, (attached to a cylinder of compressed oxygen or from a gasometer of oxygen,) through one of the openings of the feeding-grid. It is necessary that the heating up should be very gradual, the operation if properly carried out taking several hours.

I claim—

1. In the art of manufacturing carbons or filaments for incandescent electric lamps, the improvement consisting in subjecting such filaments, by consumption of fluid fuel such as specified, to a high degree of heat, as set forth, over and beyond that obtainable by the use of coke or coal surrounding the crucible, substantially as described.

2. In the art of manufacturing carbons or filaments for incandescent electric lamps, the improvement consisting in heating the same to a high temperature, as indicated, by burning fluid fuel such as specified in a suitable furnace, and at the conclusion of the operation raising the temperature to a still higher degree for a short period by the introduction of a blast of oxygen, substantially as described.

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

JOHN S. SELLON.

Witnesses:

WM. JOHN WEEKS,

C. F. WATERMAN,

Both of 9 *Birchin Lane, London, E. C.*