

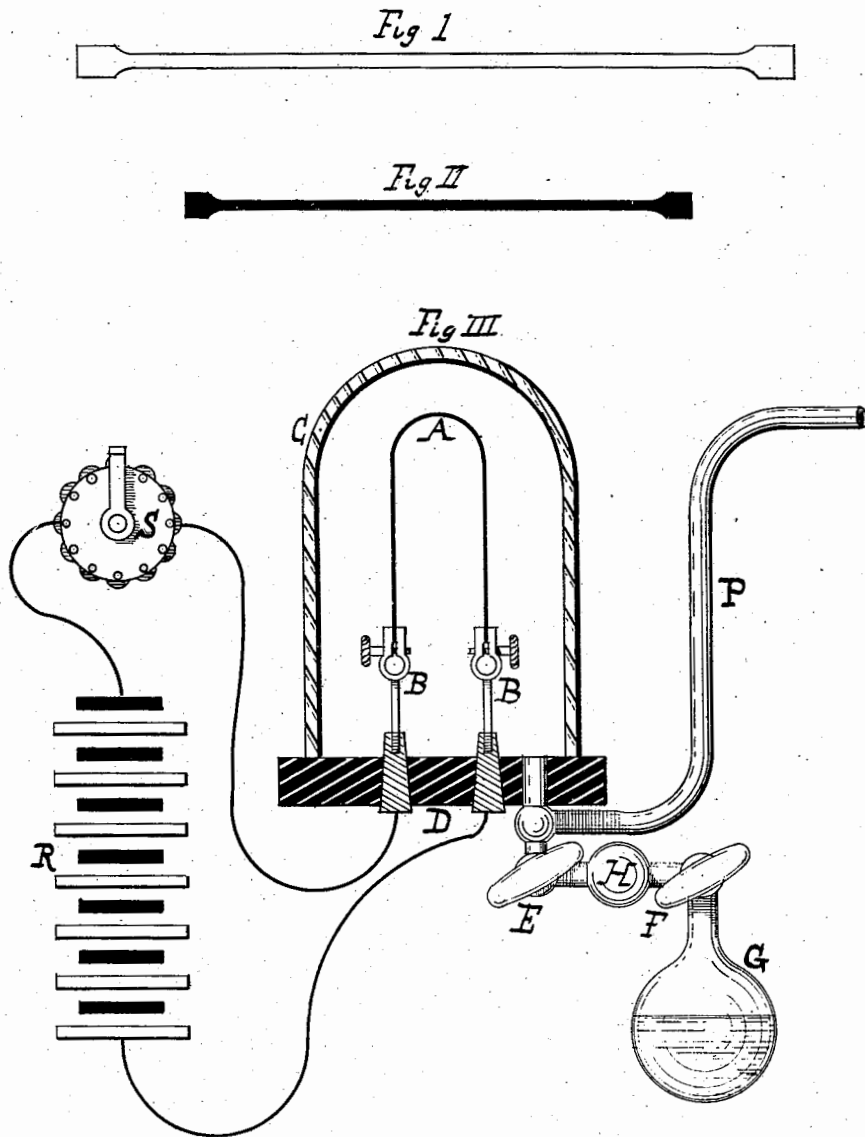
(No Model.)

H. S. MAXIM.

PROCESS OF MANUFACTURING CARBONS.

No. 247,083.

Patented Sept. 13, 1881.



Witnesses:
Joseph V. Nichols
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UNITED STATES PATENT OFFICE.

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PROCESS OF MANUFACTURING CARBONS.

SPECIFICATION forming part of Letters Patent No. 247,083, dated September 13, 1881.

Application filed April 6, 1881. (No model.)

To all whom it may concern:

Be it known that I, HIRAM S. MAXIM, of the city of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in the Process of Manufacturing Carbon Loops for Incandescent Electric Lamps, of which the following is a specification.

My invention relates more particularly to the production of the carbon loops designed for use with incandescent lamps, or those that give light by the incandescence of a strip of carbon included in an electric circuit and inclosed in a glass globe. The invention may, however, be applied to the manufacture of carbons for such other kinds of lamp as may require carbons of very small diameter bent or cut into circular or similar form; and it consists in first cutting out a straight blank, which is subsequently carbonized and then bent into the form of a loop or horseshoe, in which form it is permanently set by electrically heating the same, as will more fully appear hereinafter.

Hitherto in the manufacture of the loops and other carbon conductors of a similar character it has been usual to cut the blanks in the first instance from some fibrous material, giving to them the shape in which they are to be ultimately used. In lieu of this they were also formed by bending a straight blank to the desired shape and carbonizing it while so bent, it being found that by so doing the strips retained their arch shape. Both of these processes involve the employment of special appliances in the carbonization or baking, which add greatly to the expense of the completed carbons. It is also difficult to obtain by either method strips in which the resistance is distributed equally throughout the whole carbon.

To overcome many of the previously-encountered difficulties in the preparation of a large number of perfect carbons, I proceed as follows: I first cut out from suitable fibrous materials a number of straight blanks of small diameter at the central portion and gradually widened toward the ends, and these I carbonize, preferably by the process described in my Patent of July 20, 1880, No. 230,309. On being taken from the muffle, the strips are bent over in the form of an arch or loop, and their ends being secured in temporary holders or clamps, they

are placed in a closed vessel containing a carbonaceous gas—such as a volatilized hydrocarbon or cyanogen gas—and raised to a high heat by an electric current, or in other well-known ways. By the action of the heat carbon is deposited on the strips until they are brought to the required resistance, and on being removed they will retain the form to which they have been bent.

The accompanying drawings illustrate devices for carrying out the final steps in my process.

Figure I represents the blank before carbonization. Fig. II is the same after being baked or carbonized. Fig. III represents the apparatus employed in building up the carbons and setting them in shape.

C is a glass receiver connected with an exhaust-pump by means of a tube, P.

G is a small chamber containing gasoline or other volatile hydrocarbon, communicating with the interior of C by means of the tube H, provided with two cocks, E F, placed a short distance apart.

B B are clamping-jaws for retaining the ends of a carbon strip, A, and form the terminals of an electric circuit, in which is included a resistance, R, and switch S.

The operation is as follows: The carbons, in any suitable number, are secured to clamps B B, under the receiver C, and the air withdrawn. By closing first the cock E and opening F the part of tube H between the two is filled with hydrocarbon vapor. This is allowed to enter the receiver C, when the current is directed by switch S through the carbons. The latter are allowed to build up for a sufficient length of time, and are then removed and secured in the usual manner in the lamps. A conductor is thus produced that is remarkably free from flaws, is very resilient, and capable of withstanding a very high degree of incandescence. By this means a carbon may be formed which has no disposition to alter the shape to which it is set, which may be that of an arch, loop, ring, or even spiral.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The process of manufacturing carbon conductors for electric lamps, which consists in

100

cutting the blanks from fibrous material, carbonizing the same, bending the carbonized strips into the desired shape, and then electrically heating them for giving them a permanent set, as described.

5 2. The method herein described of fixing a carbon strip in any form to which it may have been bent, by subjecting the same while bent to the action of an electric current in an at-

mosphere of carbonaceous gas or vapor, substantially as set forth.

In testimony whereof I have hereto set my hand this 4th day of April, 1881.

HIRAM S. MAXIM.

Witnesses:

HENRY HINE,
CHAS. G. PAGE.