2 Sheets—Sheet 1.

J. K. HALLOCK.

MACHINES FOR MAKING LAMP-BLACK.

No. 195,709. Patented Oct. 2, 1877.

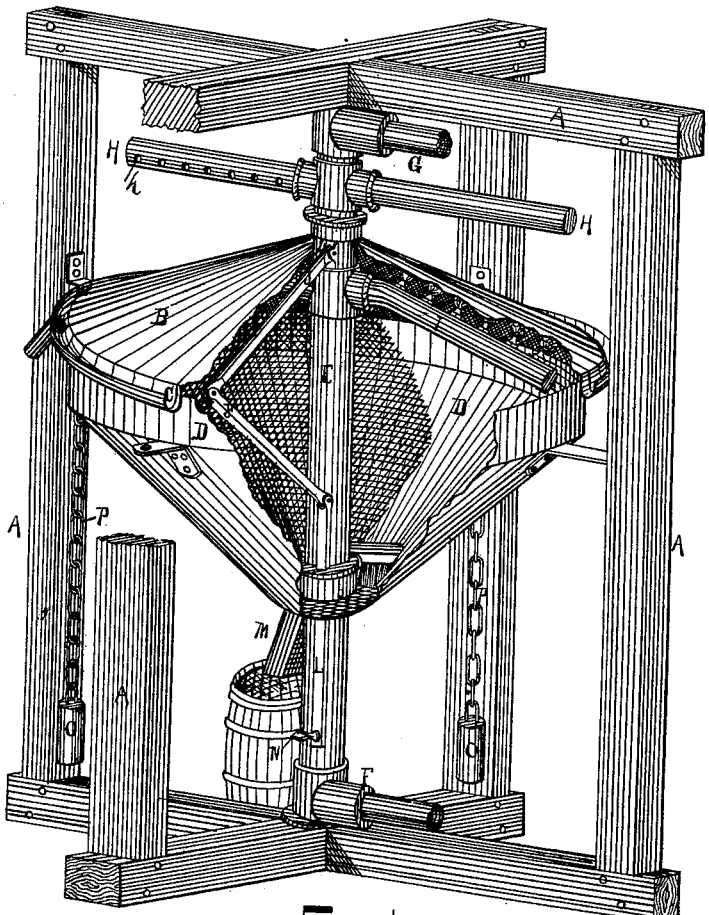

FIG. 1.

WITNESSES,

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Jas. D. Miller

INVENTOR,

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2 Sheets—Sheet 2.

J. K. HALLOCK.

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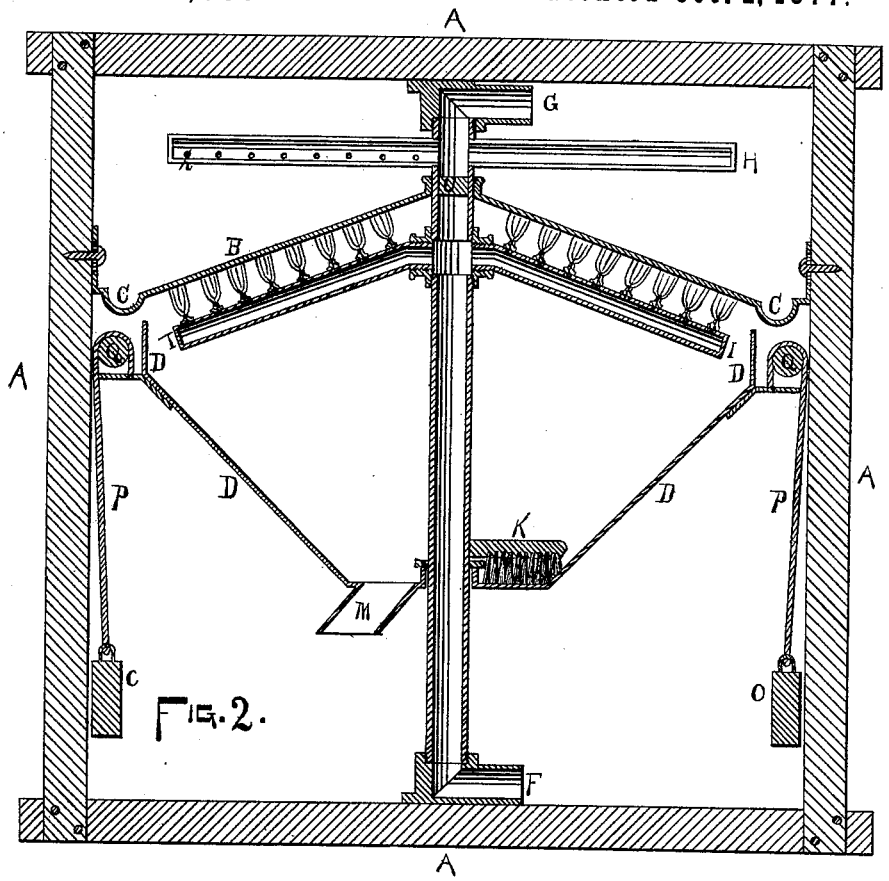

FIG. 2.

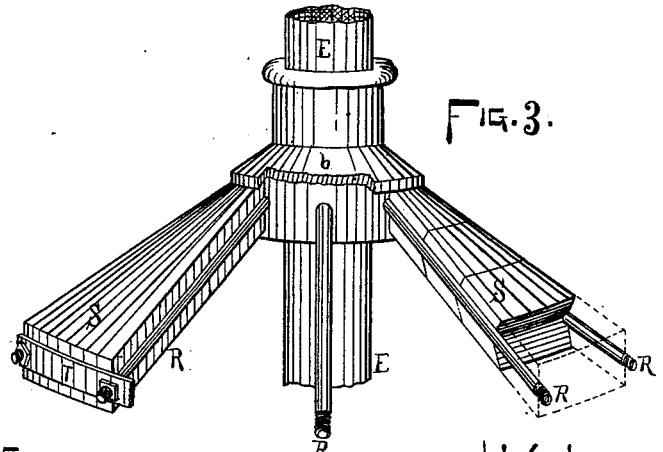

FIG. 3.

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UNITED STATES PATENT OFFICE.

JOHN K. HALLOCK, OF ERIE, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR MAKING LAMP-BLACK.

Specification forming part of Letters Patent No. **195,709**, dated October 2, 1877; application filed June 4, 1877.

To all whom it may concern:

Be it known that I, JOHN K. HALLOCK, of Erie, in the county of Erie and State of Pennsylvania, have invented a new and useful Machine for Making Lamp-Black from Gas; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the construction of machines for manufacturing carbon-black, or, as it is commonly called, lamp-black, from carbureted gas, such, for example, as what is known as natural gas, or that which flows from the earth, which, I believe, is known as hydrocarbon gas.

The manner in which lamp-black is made from hydrocarbon gas is to burn the gas with an imperfect combustion against a plate upon which the particles of freed carbon are deposited. The essential requisites of a machine for doing this work in the best manner, and to secure the largest quantity of lamp-black, are as follows: A complete regulation of the flow of gas; a complete regulation of the supply of atmospheric air, or, in other words, a complete regulation of the combustion and of the substance to be burned; also, that the plate upon which the freed particles of carbon-black are to be deposited be kept comparatively cool, so as to condense the heated and partially-burning gas, and thus insure a quick and certain deposition of the freed carbon upon it; and, also, that the position of the flame upon the plate be constantly changing, so as to not burn the black already deposited. (The black being, so to speak, the charcoal of hydrocarbon, or other carbureted gas, it can be burned or consumed as easily as the charcoal of any other substance.) Some of these requisites have been already accomplished by others, but not in the manner, or else not as perfectly, as I do it.

The manner in which I accomplish these ends, and the means I have adopted for so doing, will fully appear in the following general description of my invention.

The accompanying drawings, of which there are two sheets and three figures, show my invention as follows:

Figure 1 is a perspective view of my device, with parts broken away so as to show all the parts. Fig. 2 is a transverse vertical section. Fig. 3 is a front elevation view of the depositing-plate, constructed of stone or kindred substance, and has parts removed to show the mode of construction.

A A A represent the sustaining framework. B is the depositing-plate, and is made in the form of a canopy. It is circular, because the gas-flames are made to move in a circle. It is sloping, so as to shed the water which falls upon its upper face to keep it cool. In Figs. 1 and 2 it is shown as made of sheet metal, but in Fig. 3 it is shown as made of stone or some kindred substance. This latter construction and the reasons therefor will be fully set out hereinafter. C is a trough around the eaves of the canopy, for conveying away the water. D is a hopper-shaped hood, which sets below the depositing-plate. This is made adjustable to or from the depositing-plate by means of suspending-cords P, or chains, which pass over pulleys Q, and terminate in balancing-weights O. The object in making this adjustable is to regulate the flow of atmospheric air to the burners. It is made hopper-shaped, because the black, when scraped from the plate, falls into it and finds its way to the bottom of it, and is then brushed into the discharge-spout M. F is the gas-supply pipe, and G is the water-supply pipe. E is a hollow shaft, which has its bearings in the couplings of the pipes F and G, and in the collar of the canopied depositing-plate B, and also in the collar of the hopper D. This hollow shaft is free to revolve. It is provided below the canopy B with arms I I, on which the gas-burners are placed, and through which the gas passes after having passed up from the supply-pipe through the hollow shaft. There may be as many of these arms as desirable, and each arm may be provided with as many burners as desirable.

Above the arms I there is a plug, U, in the bore of the shaft E, which prevents gas passing above that point. Above the canopy are other arms N N, extending from the shaft E, through which passes water which comes in through the supply-pipe G. These arms are perforated, one on one side and one on the other side, by openings *h*, and as the water rushes out it propels the shaft, the action being the same as is often used in fountains.

The water, as it falls from the arms, falls upon the top of the canopy, and performs the office of keeping the depositing-plate B cool.

I do not wish to limit myself to the use of the arms N as a means of propelling the shaft or distributing the water upon the top of the plate B. Any kind of a water-motor may be used there which will serve the purpose. My object is to use the water which keeps the plate B cool as a motive power for driving the shaft, or of changing the relative position of the burners and the plate.

The arms through which the gas is fed to the burners might be stationary, and the plate B might be revolved by the water acting as a propelling agent. I prefer to revolve the burners in place of revolving the plate, as it requires much less power to do it.

I am aware that others have revolved a depositing-plate over fixed burners; but that mode of doing is very cumbersome, while my plan of revolving the burners, using the shaft as a gas-conduit, is simple, and economical of power, wear and tear, &c.

As to the use of water for keeping the depositing-plate cool, there is no novelty in it, as it is a very common thing to use water for such a purpose; but I believe that the adaptation of a device to utilize the propelling force of the water to be used as a cooler in the manner I have just described and pointed out is novel.

J is a scraper, which is jointed to the shaft E, and can be raised and lowered by the action of the rods J′ and L. This scraper revolves with the shaft, and when raised so as to come in contact with the depositing-plate will remove from it the deposits of lamp-black. As the lamp-black is removed by the scraper it falls upon the sides of the hopper, and finds its way to the bottom, where the brush K, which also revolves with the shaft, will brush it into the spout M, whence it finds its way into a receptacle placed to receive it.

By this arrangement there is no handling of the lamp-black necessary, for the receptacle above mentioned may be the package in which it is to be conveyed to the consumer.

In the drawings I have shown the plate B as fixed; but it may be made adjustable up and down, so as to adjust it properly to the flame from the burners. This may be done in the same way I have shown the hopper made adjustable. In place of this, and to secure the same result, the arms I may be made adjustable upon the shaft E by using any of the devices for that purpose common in gas-fixtures.

As I have before stated, Fig. 3 shows how stone or some kindred substance may be used to form the canopy or depositing-plate of a lamp-black machine.

It has been found by practice that stone, or something of that nature, such as tile or earthenware, will receive deposits of black more readily than iron, and a plate of such substance will not warp by being acted upon by heat, and will be easier kept smooth. That substance will also resist the action of heat much better than iron. The stone which I would recommend as probably the best, as to durability, and easiest of construction, is soapstone.

In Fig. 3 I have shown how a large plate of several feet in diameter may be constructed of stone. I do not wish to be limited to this form of construction, for a plate of this kind may be put together in many different ways. It is desirable that there be no bolts put through from the lower side, for that surface should be smooth, and bolts would also be apt to, in time, cause leakage from above.

Fig. 3 shows the shaft E and the collar *b* of the plate B. This collar is of cast metal, and has spokes R, of round bar-iron, radiating from it. The stone or tile are prepared with grooves on their sides, which fit the round bars R, which thus act as dowels or tongues.

When all the stones are in place a band, T, is put around the periphery, and secured by nuts on the ends of the bars R. On the right of the figure is shown a segment of the plate made of small pieces of stone or of tile, and on the left of the figure is shown a segment of one single stone or tile. The two middle segments are left open to show the rod R. All the seams should be thoroughly cemented to prevent leakage. When the depositing-plate is not too large, it may be made of one stone, properly fashioned.

What I claim as new is—

1. The arrangement, within a lamp-black machine having a depositing-plate, of a shaft, E, from which extend the pipes bearing the burners, said parts being so arranged and operated that the flame from the burners shall traverse said plate, substantially as herein set forth.

2. The combination, within a lamp-black machine which has a depositing-plate, to one side of which is applied a gas-flame, and to the other side a bath of water, of a centrally-located hollow shaft for supplying said gas and water to said plate, substantially as and for the purposes set forth.

3. The combination, within a lamp-black machine which has a depositing-plate, upon the upper surface of which is applied a bath of water, of a centrally-located hollow shaft, for supplying said water to said plate, substantially as and for the purposes mentioned.

4. The combination, within a lamp-black machine which has a depositing-plate, upon one side of which is applied a bath of water, and the other side of which is traversed by an impinging gas-flame, of a water-motor, through which the water of the bath passes, and whereby the said water, besides serving as a bath, also serves as a motive power for propelling the mechanism of said machine, and thus causing said impinging flame to traverse said plate, substantially as set forth.

5. In combination with the depositing-plate and burners of a lamp-black machine, a surrounding hood, the same being adjustable

toward or from said plate, for regulating the supply of air to said burners, substantially as herein set forth.

6. In combination with the depositing-plate and burners, the hood herein shown, adapted to receive the lamp-black when scraped off of said plate, substantially as herein set forth.

7. A lamp-black machine, as described, having a chamber beneath the depositing-plate for receiving the lamp-black, and having operating therein a device for removing the said black therefrom, substantially as set forth.

8. The arrangement, within a lamp-black machine having a rotary burner, of a rotary scraper, substantially as set forth.

In testimony whereof I, the said JOHN K. HALLOCK, have hereunto set my hand.

JOHN K. HALLOCK.

Witnesses:

JNO. D. MCFARLAND,

J. C. STURGEON.