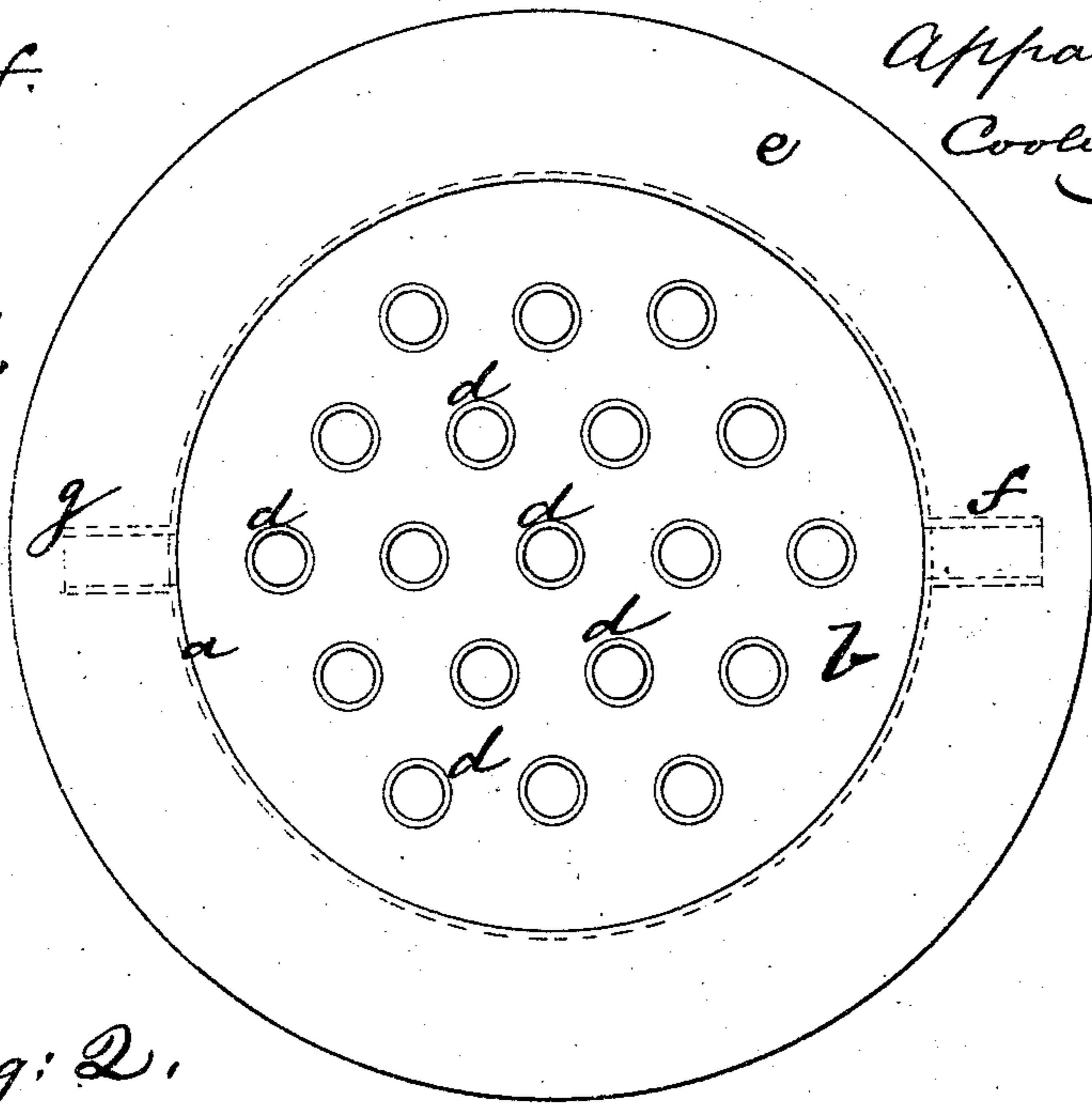


C.H. Senff.

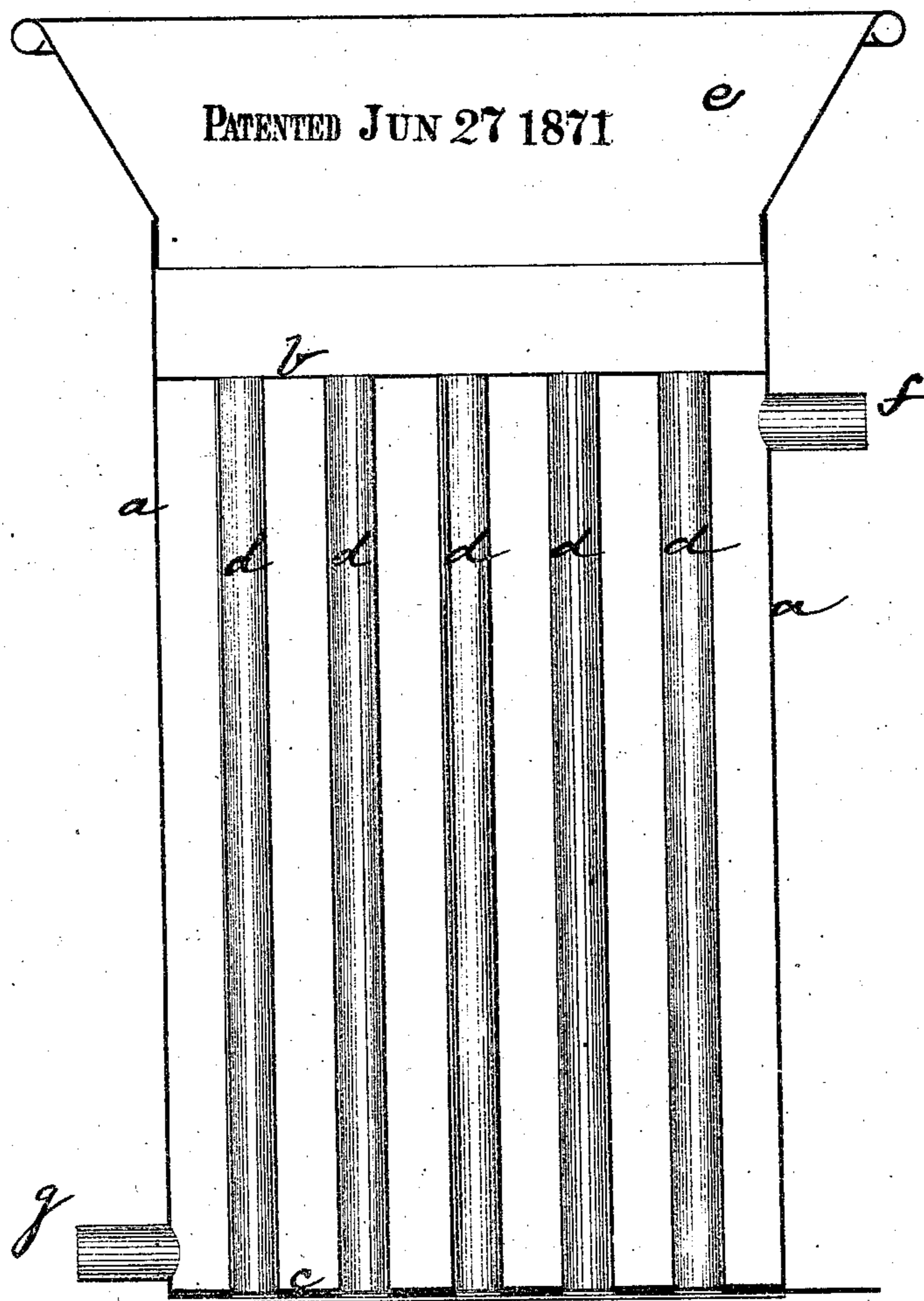
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Fig: 1.



Apparatus for
Cooling Bone Black

Fig: 2.



PATENTED JUN 27 1871

Witnesses
Peter De Laey
Wm Scott

Inventor.
Chas H Senff

UNITED STATES PATENT OFFICE.

CHARLES H. SENFF, OF NEW YORK, N. Y.

IMPROVEMENT IN APPARATUS FOR COOLING BONE-BLACK.

Specification forming part of Letters Patent No. 116,361, dated June 27, 1871.

To all whom it may concern:

Be it known that I, CHARLES H. SENFF, of the city, county, and State of New York, have invented a new and useful Improved Apparatus for Cooling Bone-Black, such as employed by refiners of sugar; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 is a top view, and Fig. 2 a vertical section of the said apparatus.

The same letters indicate like parts in the two figures.

The object of my said invention is to facilitate the cooling of bone-black, such as is used in the process of refining sugar; and to this end my said invention consists of a series of vertical tubes, combined with a surrounding and inclosing cylinder or equivalent casing, provided at the lower part with a pipe communicating with any suitable reservoir or equivalent means for the supply of cold water that it may circulate around the series of pipes, and at the upper end with an exit-pipe for the escape of the water as it becomes heated.

In the accompanying drawing, *a* represents a cylindrical vessel, with a top, *b*, and a bottom, *c*, made water-tight. A series of vertical tubes, *d*, is secured to and extends through the top *b* and bottom *c*, the ends of the said tubes being flush with the outer surface of the top *b*, and

may also be flush with the outer surface of bottom. The said cylinder is surmounted by a hopper, *e*, and near the upper end it is provided with an exit-pipe, *f*, and near the lower end with an induction-pipe, *g*, which may be connected with an elevated reservoir of water or with a pump or other suitable means for supplying water so that it shall circulate around the series of tubes, travel upward, and finally escape at the upper end through the exit-pipe *f*.

The bone-black to be cooled is supplied to the hopper and descends by gravity through the series of tubes, while, at the same time, the cold water enters at the lower end of the cylinder, and acts first on the lower end of the tubes, and gradually rises, so that the water, which is the cooling agent, travels in the opposite direction of the bone-black, which is the thing to be cooled, and which is delivered in the required state into any suitable receptacle.

What I claim as my invention, and desire to secure by Letters Patent, is—

The series of vertical pipes, in combination with the surrounding cylinder or equivalent casing, provided with a hopper at the upper end and with an induction-pipe at the lower end, and a discharge-pipe at the upper end, substantially as and for the purpose set forth.

CHAS. H. SENFF.

Witnesses:

A. J. DELACY,
WM. H. BISHOP.