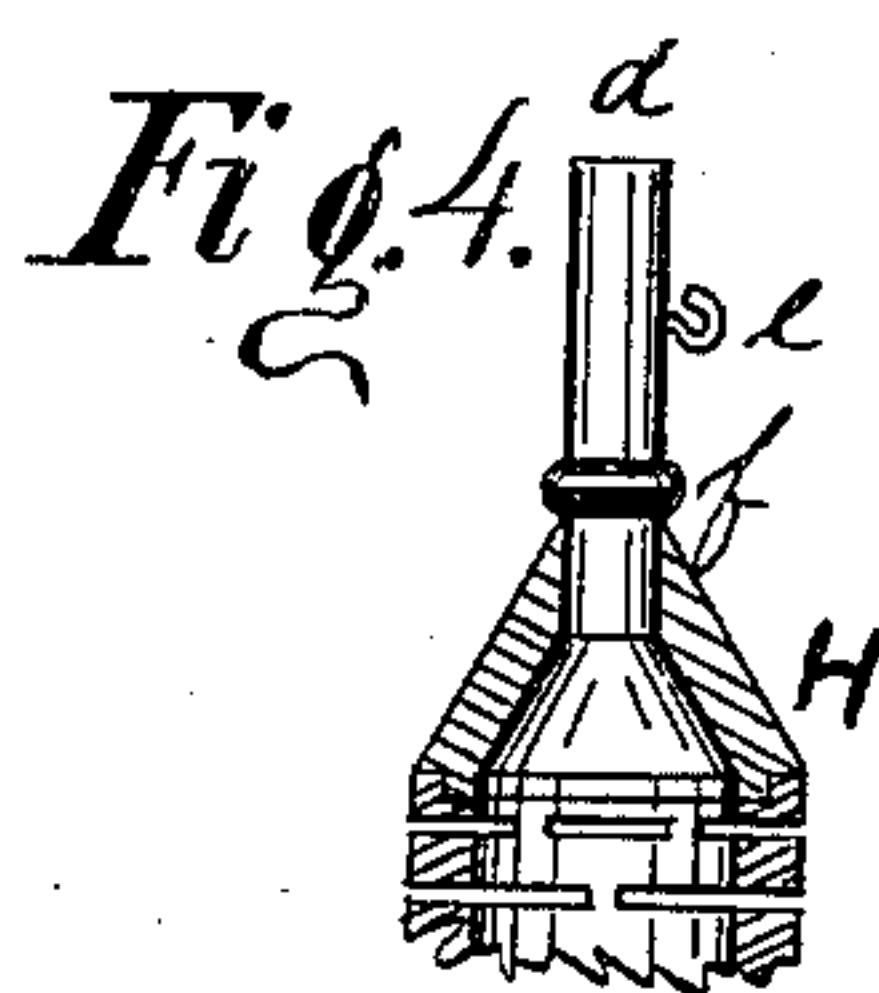
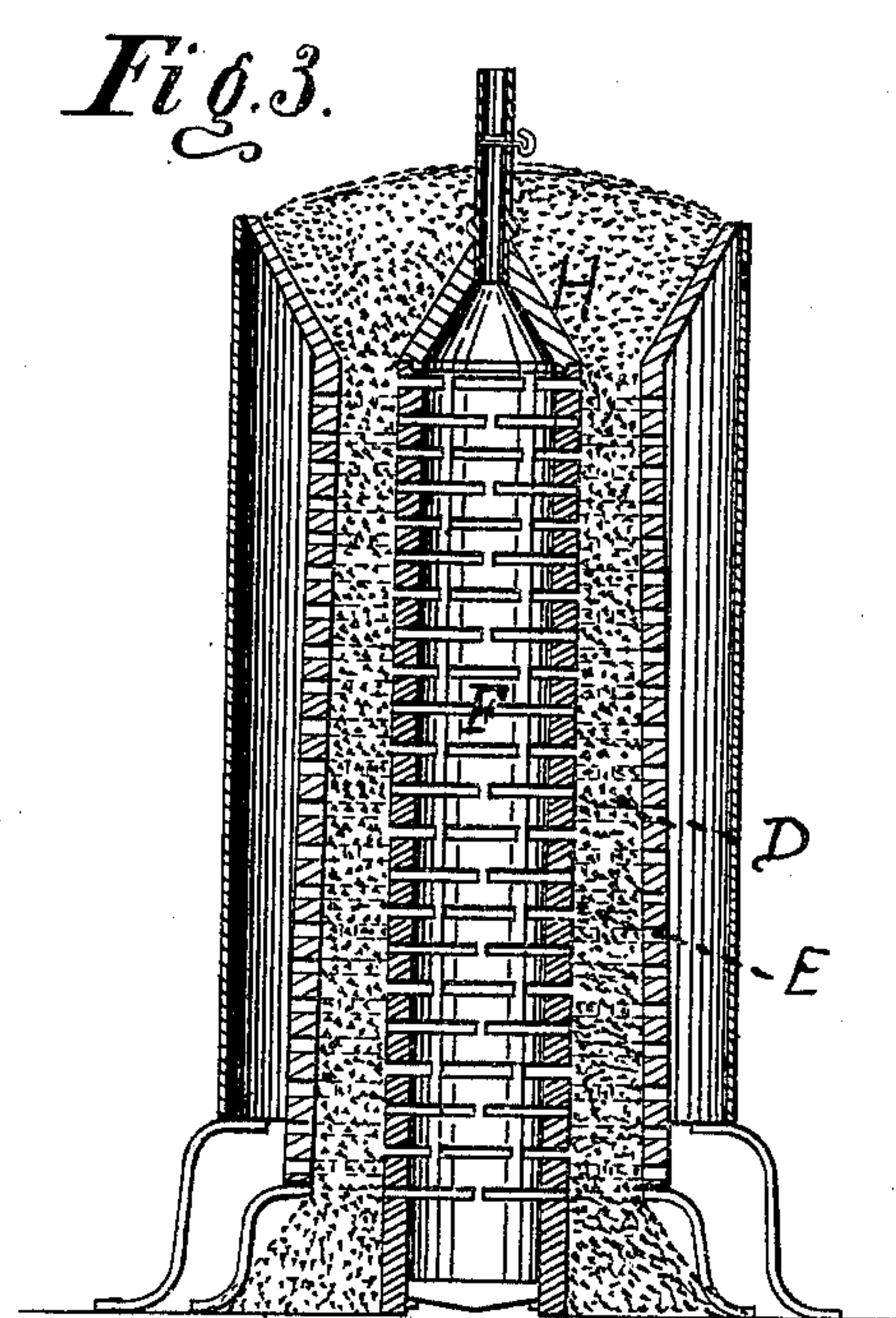
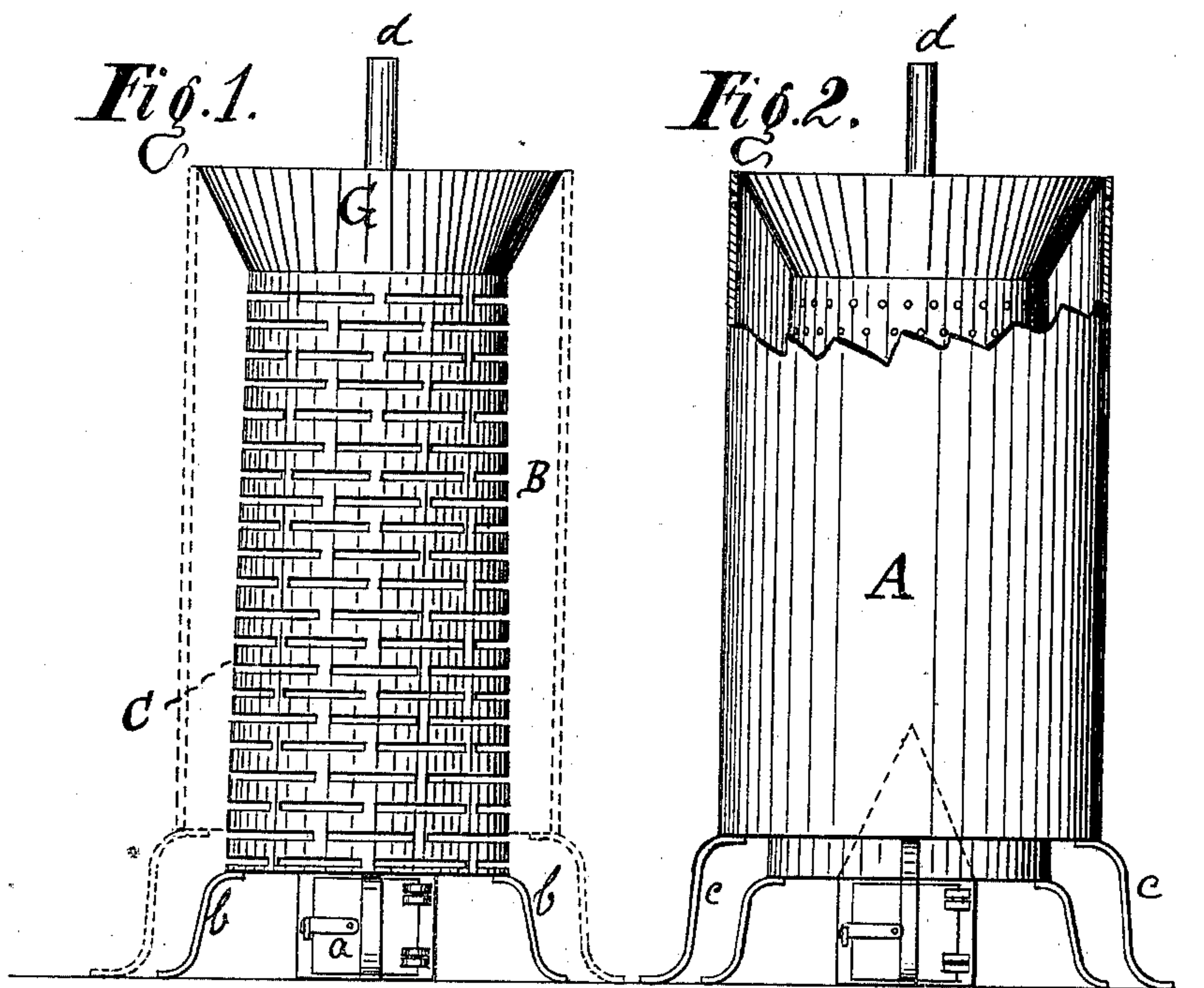


J. McC. PERKINS.
SAND AND GRAVEL HEATER.

No. 170,894.

Patented Dec. 7, 1875.



WITNESSES:

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IMPROVEMENT IN SAND AND GRAVEL HEATERS.

Specification forming part of Letters Patent No. **170,894**, dated December 7, 1875; application filed December 4, 1875.

To all whom it may concern:

Be it known that I, JOHN McCLARY PERKINS, of the city of Washington, in the county of Washington and District of Columbia, have invented certain new and useful Improvements in Sand and Gravel Heaters; and I do hereby declare that the following is a full, clear, and exact description thereof, that will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

The same letters and figures of reference are used to indicate the corresponding parts.

After describing the invention, its nature and extent will be shown in the claims.

The object of my invention is to furnish an improved sand and gravel heater, more efficient and simple than those in common use.

In order to fully understand the nature of my invention, I will first describe the defects of the machines of this character now in common use for the purpose of heating the sand and gravel to be used in the manufacture of concrete for street-pavements. One is a long horizontal cylinder, inside of which a shaft revolves, and by suitable devices carries the sand or gravel from one end of the cylindrical chamber to the other end, where it slowly drops on the ground. This machine is quite expensive to buy and to run, and performs, comparatively, little work. While it may be a success as a coffee-roaster, it is a marked failure as a sand-heater. The other machine is an old form of a drier, which has been used for drying grain and other materials. It consists of a sand-chamber, whose walls are two perforated cylinders, one cylinder being placed within the other. The inner cylinder has a solid conical top, from which the sand or gravel slides into the annular chamber. The outer cylinder is provided with a flaring collar at the top, forming a sort of basin to hold the sand there ready to fall into the chamber below. Within the inside cylinder is the fire-chamber, the fire-pot being simply the bottom of the chamber provided with an ordinary fire-grate.

Now, the desirable result sought for in a sand or gravel heater is to keep the sand-

chamber surrounded on all sides with hot air at the highest possible temperature.

The machine last described is much more efficient and simpler than the one first described; but it has several very material and important defects. All the smoke and products of combustion are forced to escape through the superincumbent sand. This lessens the heat of the fire-chamber. Then the two cylinders forming the sand-chamber have parallel sides, and a series of chambers are frequently formed with the sand-chamber, on account of the wet sand adhering to the sides of the chamber in its descent.

Another and a very serious evil is the comparatively low temperature of the outside cylinder, in consequence of its exposure to the direct blasts of cold air.

I will now describe my invention, and then state its special advantages.

Figure 1 is a front view of my invention with the hot-air jacket removed. Fig. 2 is a view with the jacket in place, the top being broken away. Fig. 3 is a vertical sectional view taken through the center; and Fig. 4 is a front view of the top of the fire-chamber, showing its cover and the smoke-pipe.

A is the hot-air jacket; B, the hot-air chamber; D, the sand-chamber; C and E, the outer and inner walls of the sand-chamber, both of which are perforated to admit hot air for the purpose of driving away the escaping steam from the drying sand. These perforations may be either in the form of an oblong horizontal slot, or they may be small circular openings; or they may be made with a downward angle in the direction of the falling sand, if desired. The slots at right angles with the cylindrical walls are preferred, however, because of the lesser difficulty in the manufacture of the cylinders in this manner. The oblique slots have no advantage in confining the sand in its chamber, as the sand to be dried is damp and wet, and neither escapes into the fire-chamber nor the hot-air chamber, whatever form of slots is made. Indeed, the sand, in actual practice, must be forced down with a rammer by a man at the top of the sand-chamber, standing on an elevated platform made there. The sand is carried to this platform by an inclined plane connected therewith. F is the hot-air cham-

ber, extending the whole length of the slotted cylinder E. This cylinder rests on the ground, and is provided with a grate and a door, *a*. The bottom of this cylinder constitutes the fire-pot. At the top of the fire-chamber is a conical cover, with no perforations or slots. (Shown by H.) At the apex of this cone the small removable smoke-pipe is placed, being provided with a damper, *e*. The flange *f* holds the pipe on the top of the cone or cover H. C is made with its sides tapering, the smaller diameter being at the top and the larger at the bottom. It stands on legs, and is raised from the ground, so that its bottom perimeter is about on a level with the top of the door to the fire-pot. Its top is provided with a flaring flange or collar, G. The hot-air jacket is shown by A, and is provided at its top with slots for the exit of air laden with vapor from the heated sand. These slots may be open or closed by any of the common forms of dampers.

The operation of drying the sand is now obvious.

The advantages of my invention are, that the perforated cylinder, enlarged at the bottom, allows the sand to descend without difficulty. The smoke-pipe allows the smoke, &c., to pass off, after which the damper is closed. The hot-air jacket keeps the outside perforated tapering cylinder with its surrounding air at

a high temperature. All these advantages tend to one common result—namely, to keep air surrounding and permeating the sand-chamber at the highest possible degree of heat.

Having now fully described my invention, and the advantages resulting from its use, what I claim, and desire to secure by Letters Patent, is—

1. In a sand and gravel heater, the laterally-perforated cylinder, having a solid conical top or cover, in combination with a tapering perforated exterior cylinder, elevated from the ground to allow the removal of the falling sand, and provided with a flaring collar, substantially as described, and for the purposes set forth.

2. The combination of the hot-air jacket, elevated from the ground, as shown, and provided with perforations or slots near its top, and fitting closely to the top perimeter of the flange G, with the tapering perforated cylinder C, perforated cylinder E, cover H, and smoke-pipe *d*, substantially as described, and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of December, 1875.

JOHN McCLARY PERKINS.

Witnesses:

ULYSSES G. WHITE,
THOMAS C. CONNOLLY.