

J. D. CAMPBELL & J. S. DRAKE.  
Steam-Muffler.

No. 224,644.

Patented Feb. 17, 1880.

Fig. 4.

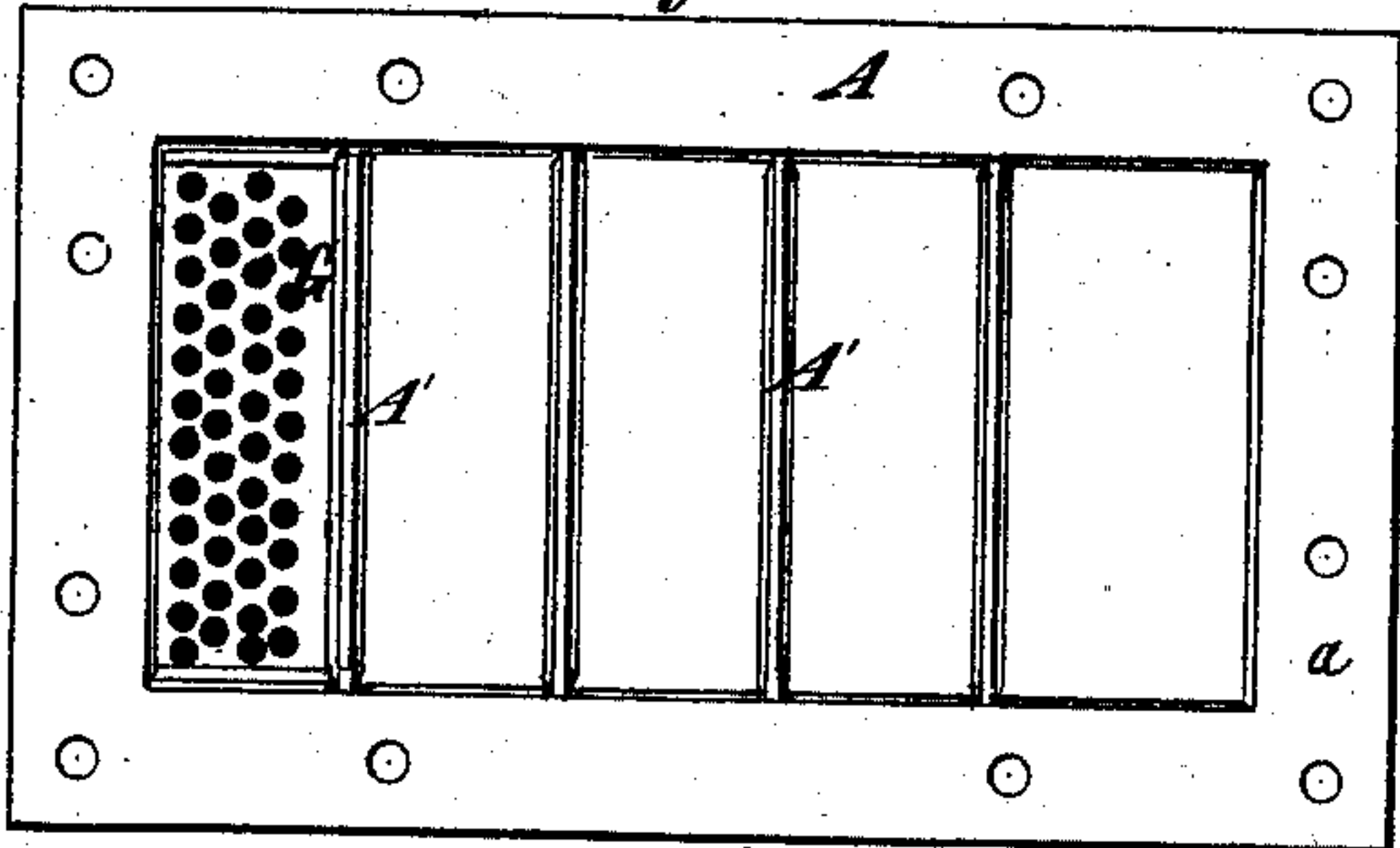


Fig. 5.

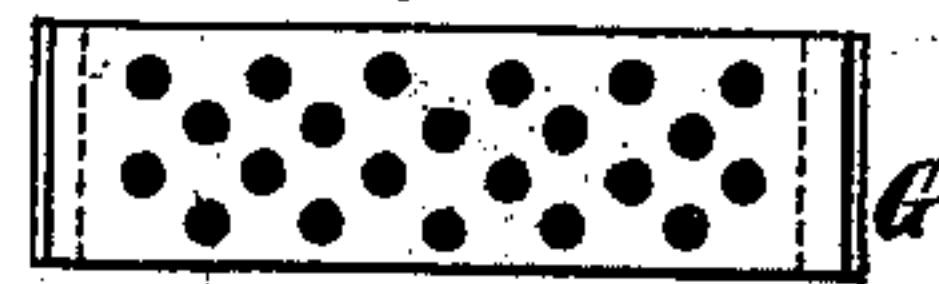


Fig. 6.

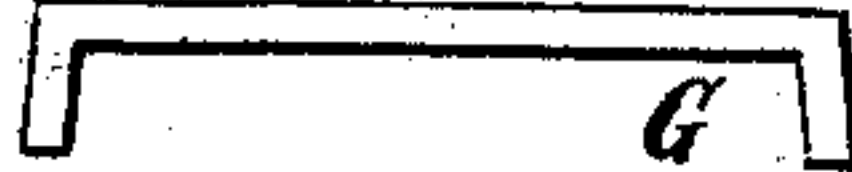


Fig. 1.

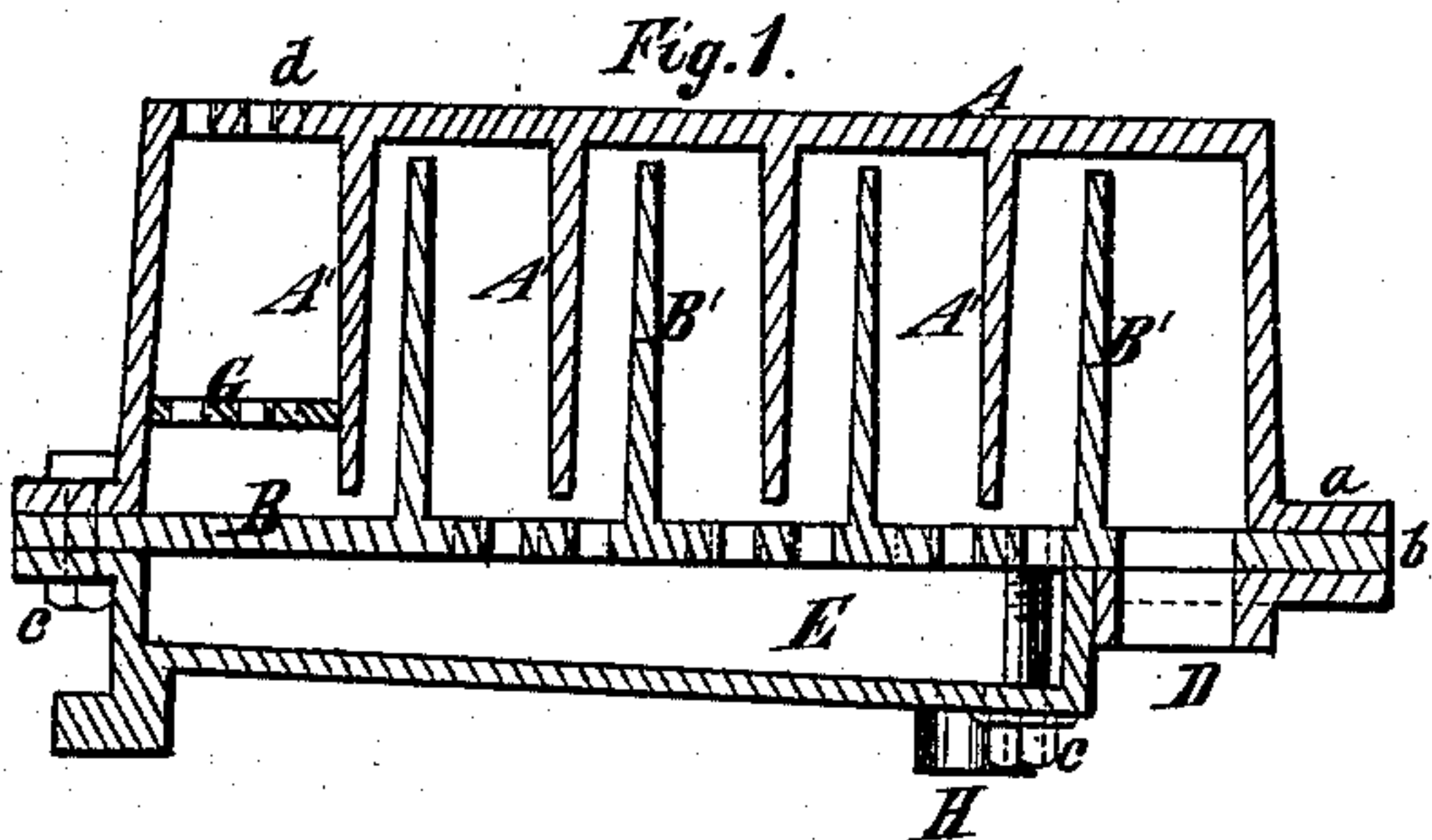


Fig. 2.

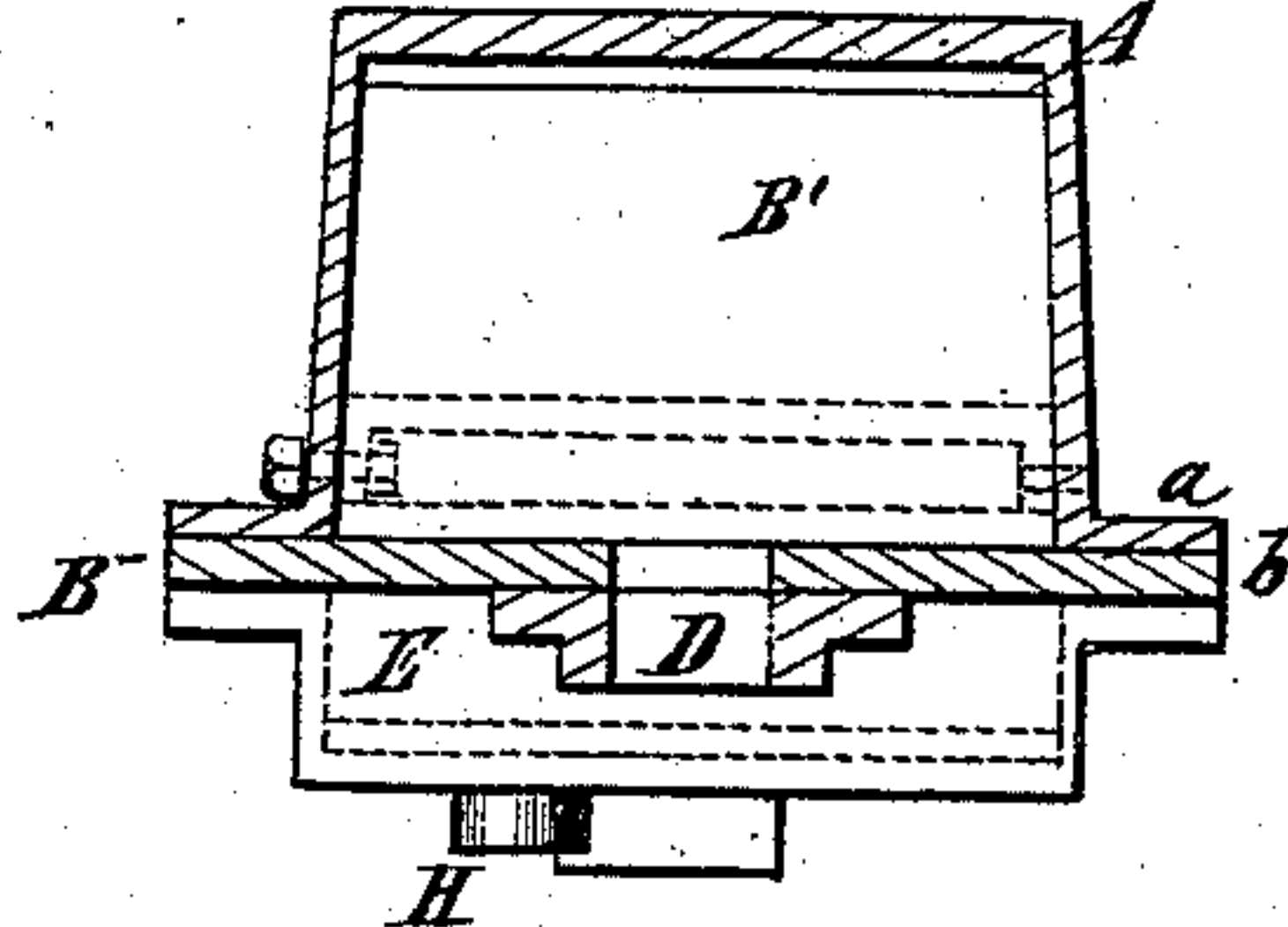
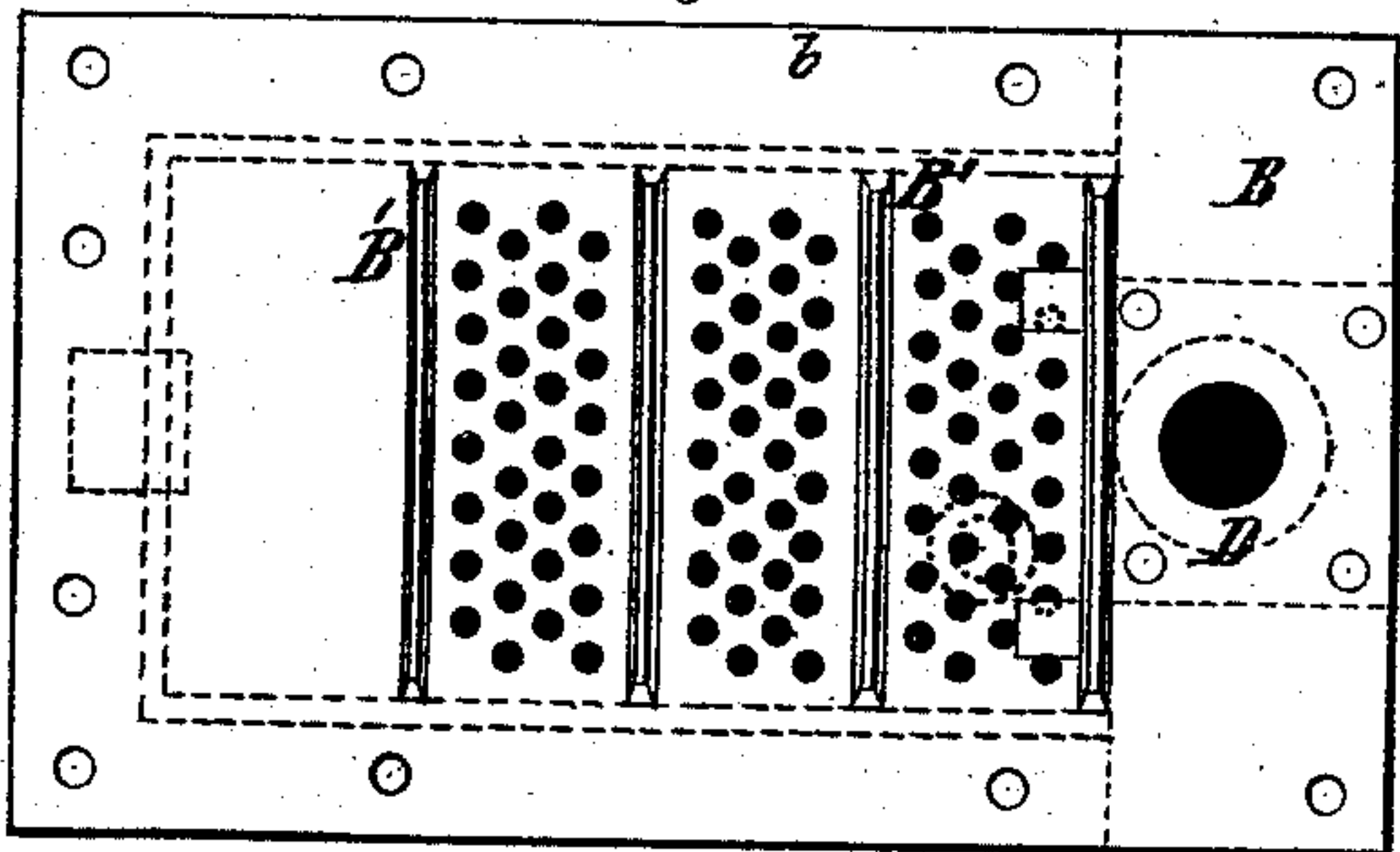


Fig. 3.



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# UNITED STATES PATENT OFFICE.

JOHN D. CAMPBELL AND JAMES S. DRAKE, OF NEW YORK, N. Y.

## STEAM-MUFFLER.

SPECIFICATION forming part of Letters Patent No. 224,644, dated February 17, 1880.

Application filed July 31, 1879.

*To all whom it may concern:*

Be it known that we, JOHN D. CAMPBELL and JAMES S. DRAKE, both of the city, county, and State of New York, have invented certain new and useful Improvements in Steam-Mufflers, of which the following is a specification.

The object of our invention is to produce a simple and effective device whereby steam escaping from a steam-engine may be muffled so as to occasion less noise than ordinarily, and also to prevent water formed by condensation from blowing around to the annoyance of people in the vicinity, such as passengers in a car drawn by a steam-locomotive.

The invention consists in the combination of a chamber, series of diaphragms or partitions extending alternately from opposite sides of the chamber nearly but not quite to the other, leaving a circuitous passage through the chamber formed of alternate large and small spaces, and a drain-pan for the water of condensation, whereby the desired ends are attained.

In the accompanying drawings, Figure 1 is a longitudinal section of a steam-muffler embodying our invention. Fig. 2 is a transverse section thereof. Fig. 3 is a plan of the lower section thereof. Fig. 4 is an inverted plan of the top section thereof. Fig. 5 is a top view of a perforated diaphragm forming part of the muffler, and Fig. 6 is an edge view of said diaphragm.

Similar letters of reference designate corresponding parts in all the figures.

A B designate a chamber, which, though here represented as rectangular, may be cylindrical, and is composed of two longitudinally-divided sections, A and B, provided with flanges *a b*, which are connected by screws or screw-bolts *c*. These sections are severally provided with series of plates A' B', extending from them and forming partitions or diaphragms in the chamber, extending nearly but not quite to the opposite side or section, the two series forming a circuitous passage through the chamber. Preferably the partitions or diaphragms are not arranged equidistant, but so as to form alternately spaces of different sizes between them, as shown in Fig. 1.

At one end the chamber is provided with a steam-inlet, D, into which steam may be conducted by a pipe from the exhaust-passage of a steam-engine.

The bottom of the section B is perforated, so as to let water formed by the condensation of steam run off into a drain-pan, E, fastened to the bottom section, B.

Between the partition or diaphragm nearest the outlet end of the chamber and the adjacent wall of the chamber a perforated partition or diaphragm, G, is arranged, and the opposite portion of the top wall of the chamber is furnished with perforations *d*. Hence the steam, after leaving the partitions, is broken up into small jets and deprived of much of its force.

The arrangement of spaces between the plates or diaphragms A' B' is such that the steam passes downwardly through all the narrow spaces, and the increased velocity of the steam causes the water which is created by the condensation to be driven to the bottom of the chamber and through the perforated bottom of the section B. By passing through the circuitous passage formed by the partitions or diaphragms, and thence through the perforated diaphragm G and top wall of the chamber, its force is spent, so that it creates but little noise, and as the water of condensation is collected in the drain-pan and separated from the steam, the latter will not in issuing prove a source of annoyance to persons in the vicinity. The water may be conveyed from the drain-pan by an outlet, H.

This muffler is simple and effective and well adapted for steam-locomotives used in cities.

It is obvious that a circular chamber provided with circular partitions extending alternately from opposite sides and nearly to the other sides and having a drain-pan arranged below it would be very serviceable.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a steam-muffler, the combination of a chamber and a series of vertical or upright partitions, forming a circuitous passage having alternately large and small spaces, and a drain-pan arranged transversely to and communicating with said spaces, substantially as specified.



2. In a steam-muffler, the combination of a chamber and a series of vertical or upright partitions, forming a circuitous passage having alternately large and small spaces, a  
5 drain-pan arranged transversely to said spaces, and a perforated plate separating said drain-pan from said spaces, substantially as specified.

3. In a steam-muffler, the combination of a chamber, series of partitions extending from

opposite walls, and a perforated diaphragm 10 extending between the partition nearest the outlet end and the adjacent wall of the chamber.

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