3 Sheets. Sheet. 1.

P. Munzinger,

Gas Purifier.

No. 109,142. Patented Nov. 8. 1870.

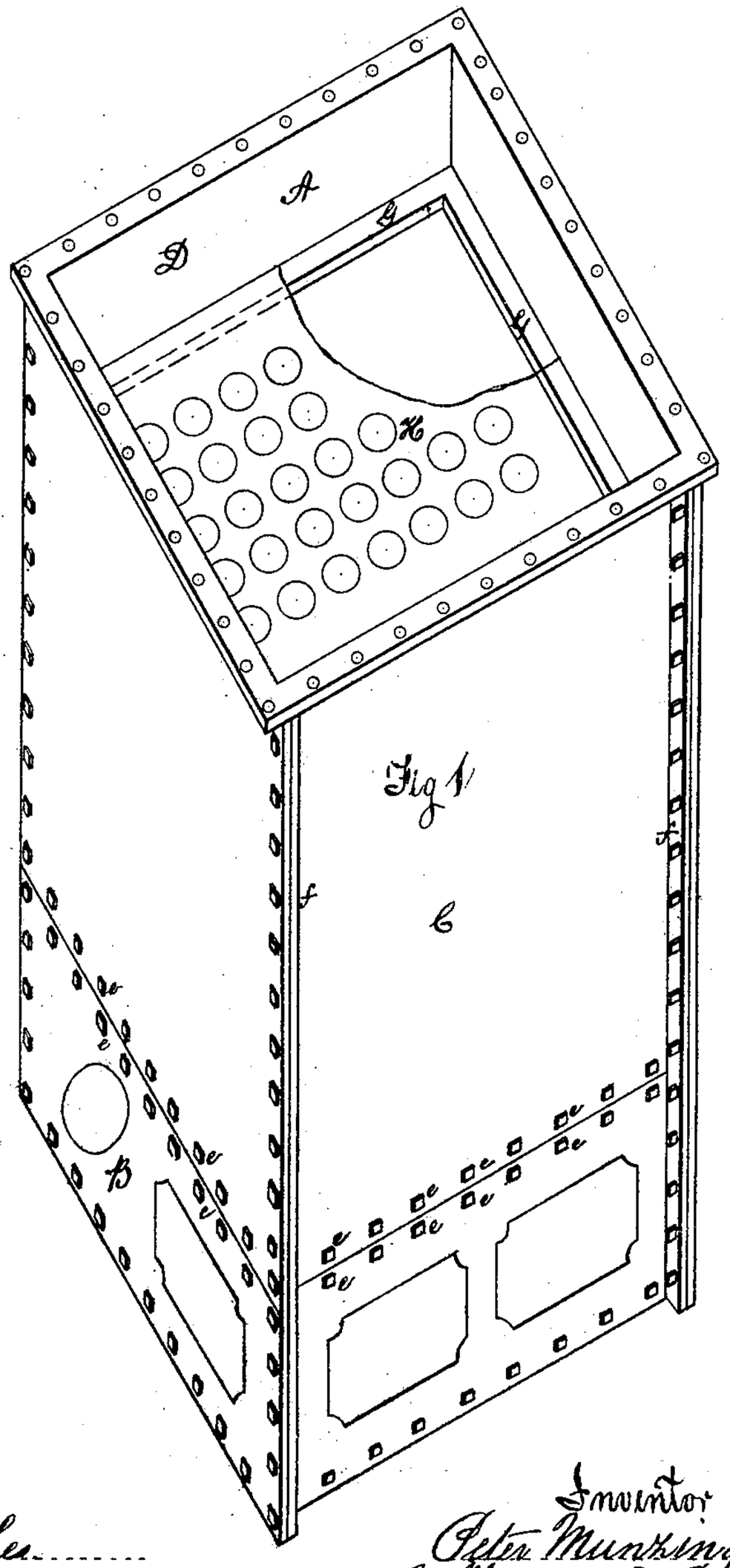

Fig 1.

Witnesses.
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3 Sheets, Sheet 2.

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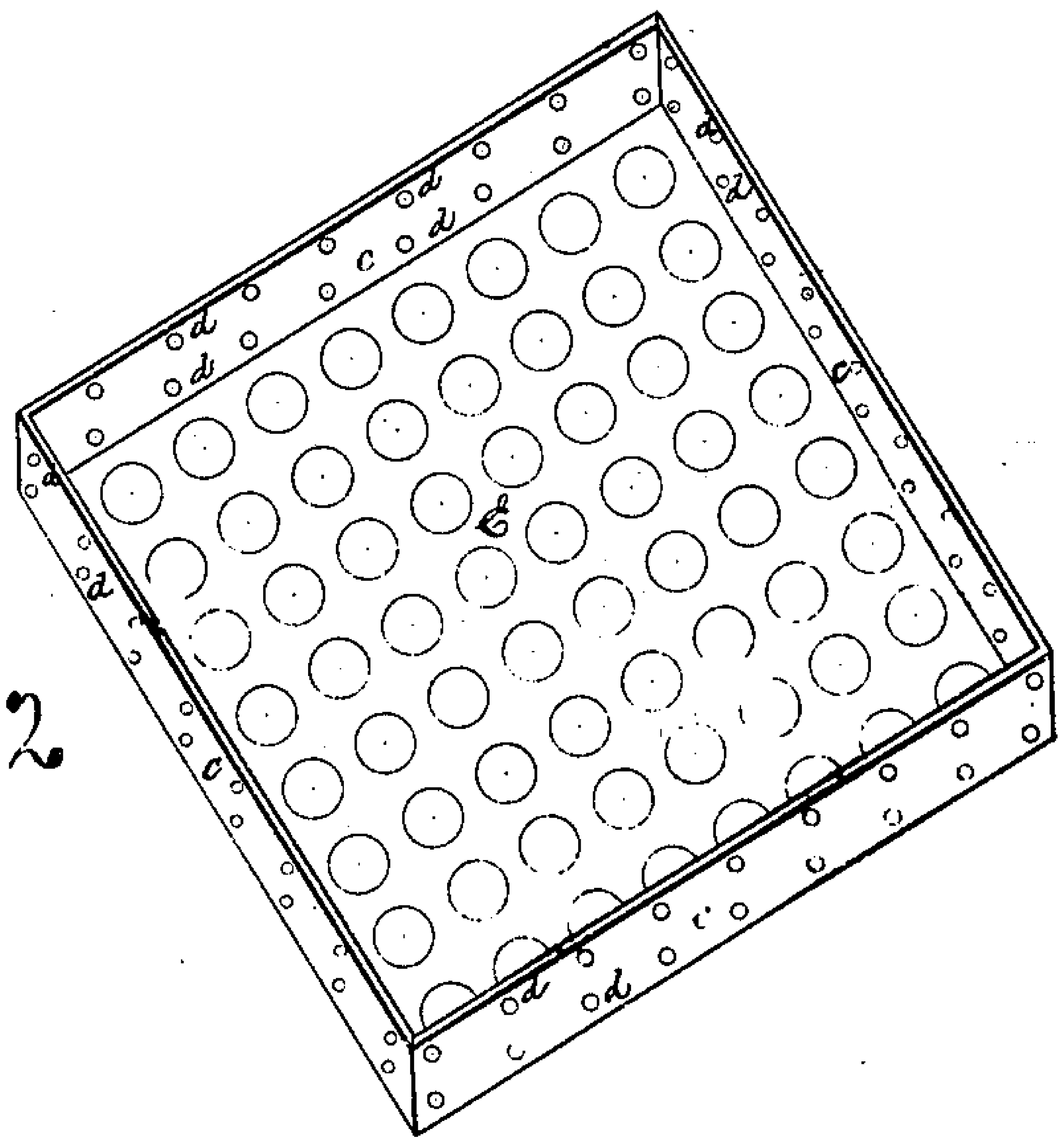


Fig 2

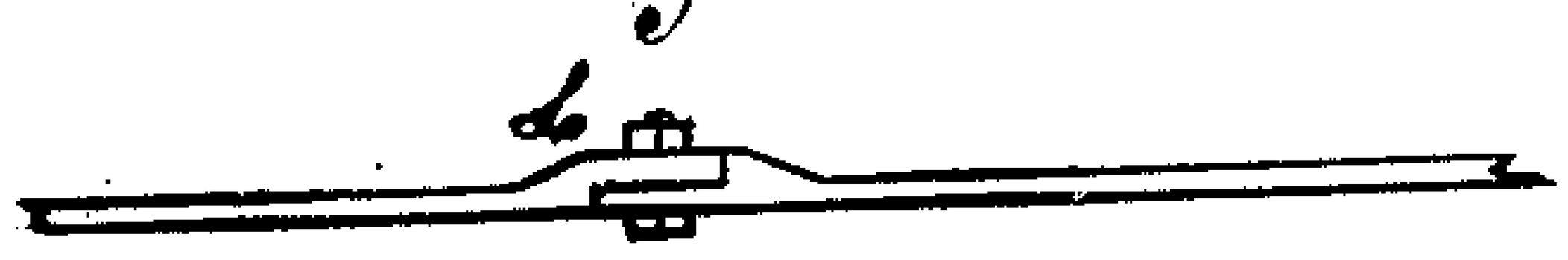
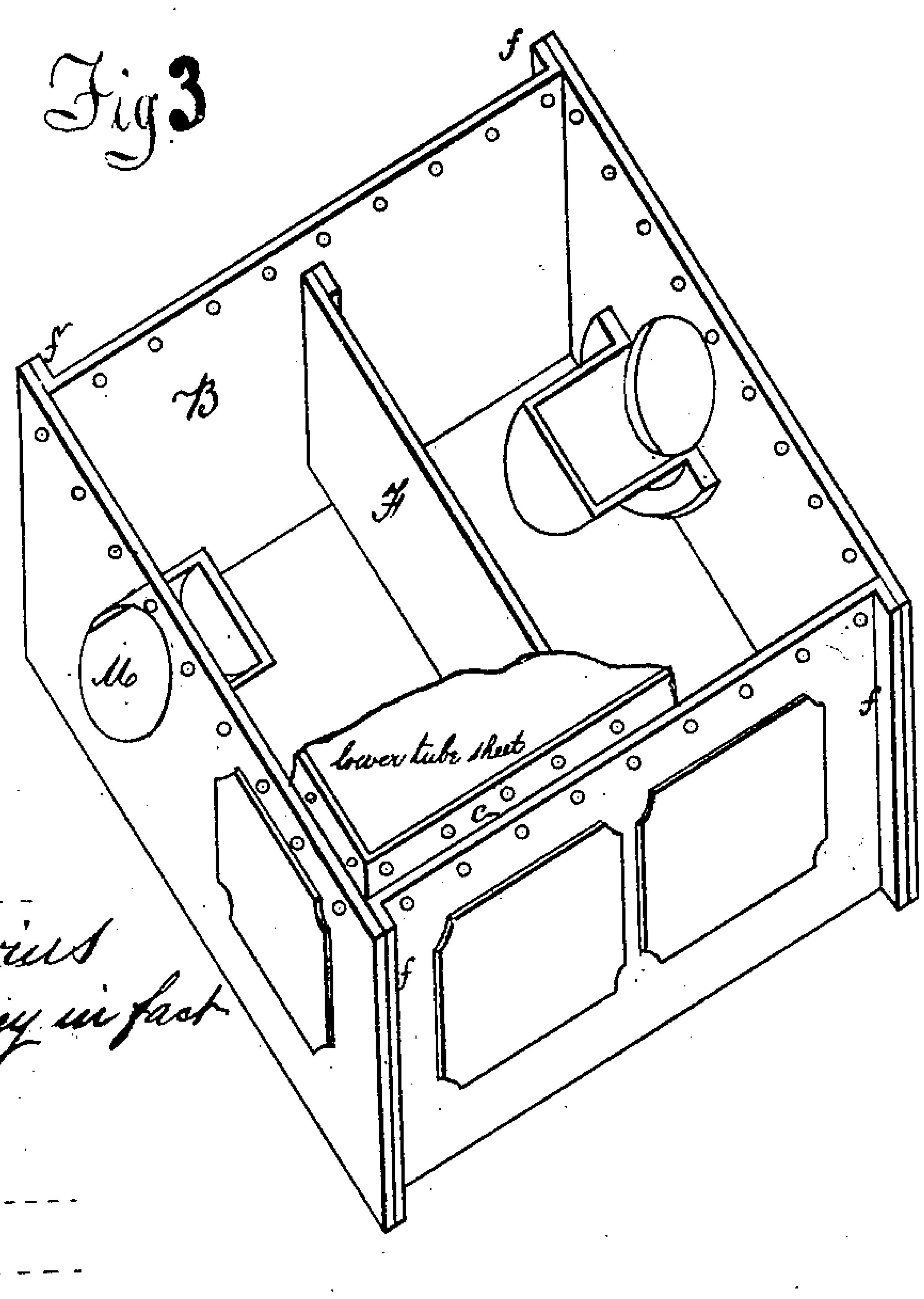


Fig 7

Fig 3



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P. Munzinger, 3. Sheets. Sheet 3.

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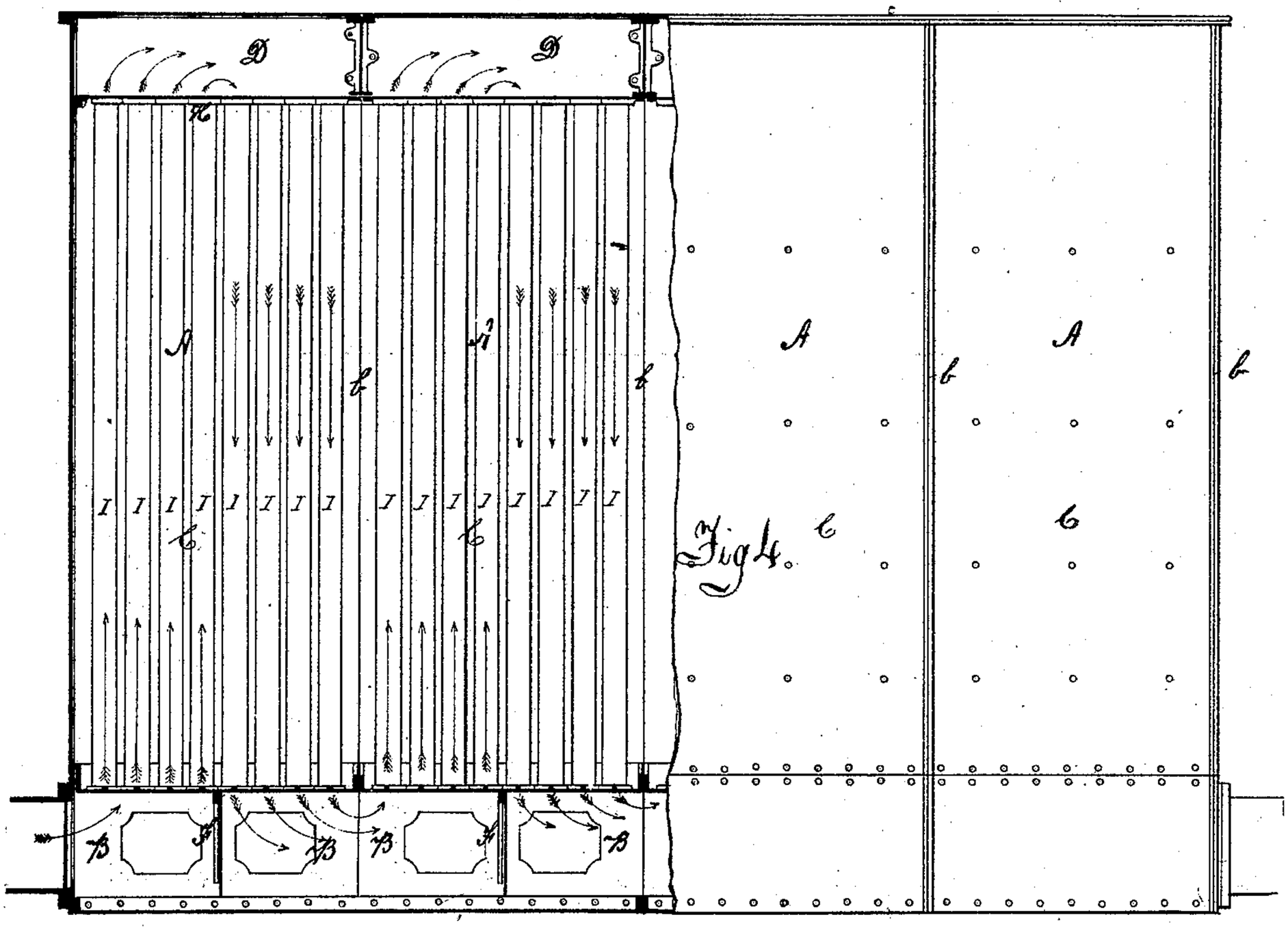


Fig 4.

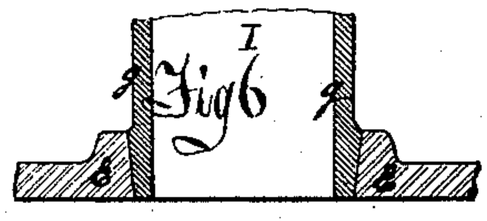
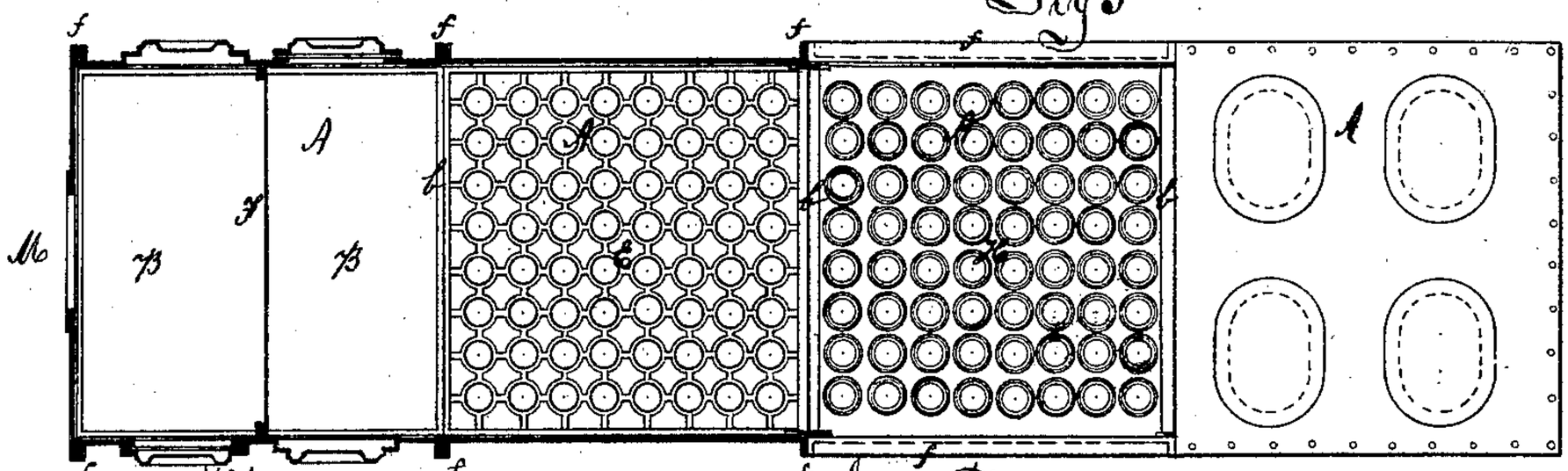


Fig 6

Fig 5



Witnesses

[illegible]

John Fuller

Inventor

Peter Munzinger

By Francis D. Pabstmeis

his Attorney in fact

United States Patent Office.

PETER MUNZINGER, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 109,142, dated November 8, 1870.

IMPROVEMENT IN CONDENSERS FOR GAS-WORKS.

The Schedule referred to in these Letters Patent and making part of the same.

I, PETER MUNZINGER, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improved Multitubular Water-Condenser for Gas-Works, of which the following is a specification

Nature and Object of the Invention.

My improved condenser is composed of three parts, viz.: an inlet-chamber, a tube or condensing-chamber, and an upper chamber or gas-passage; it is designed for the purpose of increasing its capacity by extending it either laterally or longitudinally, and to that end the several parts are fastened together by means of outwardly-projecting flanges.

Description of the Accompanying Drawing.

Figure 1 is a perspective view.

Figure 2 is a perspective view of the lower tube-sheet.

Figure 3 is a perspective view of the inlet-chamber.

Figure 4 is a vertical sectional view.

Figure 5 is a plan view partly sectioned.

Figure 6 is a sectional view of the tapering ground-joint for the tubes.

Figure 7 is the old method of joining the parts of a condenser by means of a lap-joint.

General Description.

The condenser is divided into vertical sections A, as shown at *b*, fig. 4, each of which is subdivided into three compartments by horizontal sections, viz.: an inlet-chamber, B, a tube or condensing-chamber, C, and an upper chamber or passage, D. The inlet-chamber B and the tube or condensing-chamber C are connected by means of the lower tube-sheet E, which has upwardly or downwardly-projecting flanges *c*, as the case may require. It fits snugly into the inlet-chamber, fig. 3, resting on the diaphragm or gas-deflector F. The flanges are pierced by a double row of holes, *d d*, as shown at fig. 2, corresponding to the bolt-holes *e* in the inlet and tube-chambers, as shown at fig. 1, by which the whole are firmly and securely bolted together.

The inlet and tube-chambers have outwardly-projecting flanges *f*, by which they are fastened together, so that, if the condenser should require enlarging, additional side or end-plates can be let in.

The tube or condensing-chamber C has a flange, G, formed around its inner upper part for carrying the top tube-sheet H.

The tubes I, through which the gas passes, are secured to either the upper or lower tube-sheet, or both, by means of a tapering ground-joint, *g*, as shown at fig. 6.

Heretofore the inlet-chamber and the lower tube-sheet have been cast together, with bells or sockets, into which the lower ends of the tubes were inserted and sealed with lead joints.

The tubes require to be of very thin metal, that the surrounding water may produce a rapid condensation and cause the gas to drop its tar and ammoniacal liquor into the receiving-chamber B. The thinness of the tubes makes them liable to rust when one becomes defective, particularly in the center. The sides of the condenser require taking out and the intermediate tubes removed before the defective one can be reached and the lead sealing melted. By the use of my ground taper joint the tube can be driven from the lower tube-sheet through the upper sheet, and be taken out at the top of the condenser, and be replaced without in the least interfering with the other parts of the condenser.

I am aware that cylindrical ground joints have been used, the objection to their use being that the tube rusted in its socket, and could not be driven out, which is not the case with the tapering ground-joint.

As shown at L, fig. 7, formerly the sides and ends of a condenser were connected by a lap-joint, which made it necessary for a workman to remove a number of tubes before getting at the bolts which hold the condenser together; by the use of my flanges the bolts are all on the outside of the condenser.

The gas from the inlet M enters the receiving-chamber B, and is deflected by the partition F, which is water-sealed, up the first bunch of tubes into the chamber D, when it is deflected by the second row of tubes, as shown by the arrows, fig. 4, until it has traversed the entire number.

What I claim as my invention is—

1. A multitubular condenser, with flange-attachments, for the purpose shown and described.

2. A multitubular condenser, composed of the inlet-chamber B, condensing-chamber C, chamber or passage D, and the lower tube-sheet E, as shown and described.

3. The tapering ground-joint, for the purpose shown and described.

In testimony whereof, I hereunto sign my name to this specification in presence of two subscribing witnesses.

PETER MUNZINGER.

Witnesses:

FRANCIS D. PASTORIUS,

JOHN YILLE.