No. 706,238. Patented Aug. 5, 1902.

C. W. ISBELL.

GAS RETORT.

(Application filed Aug. 21, 1901.)

(No Model.)

Fig. 1.

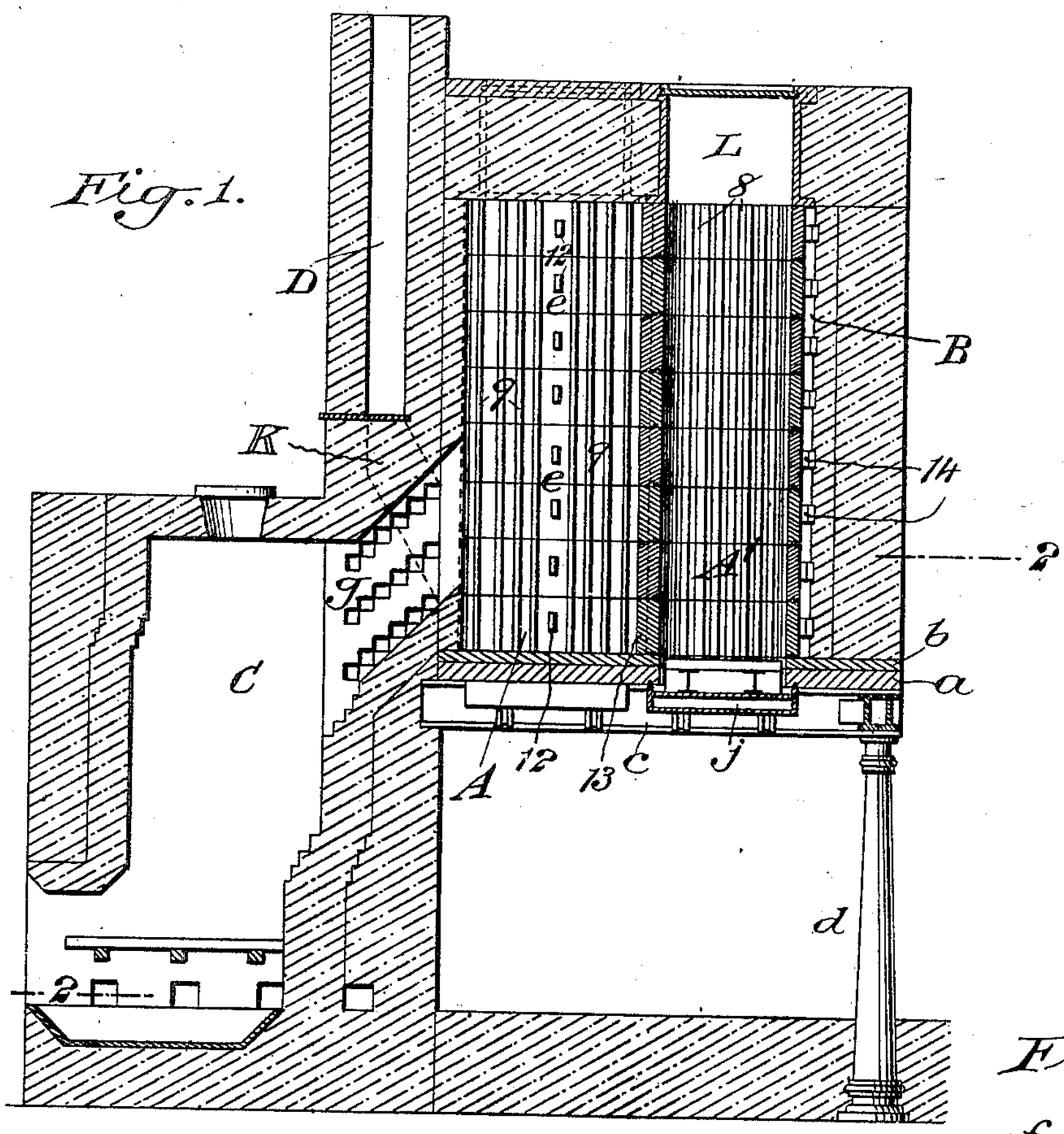


Fig. 3.

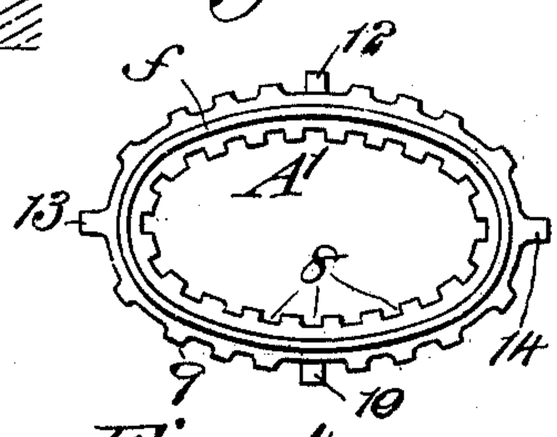


Fig. 4.

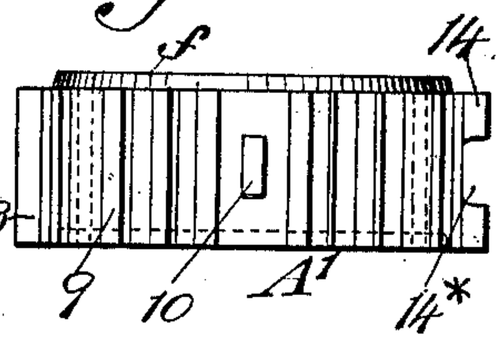
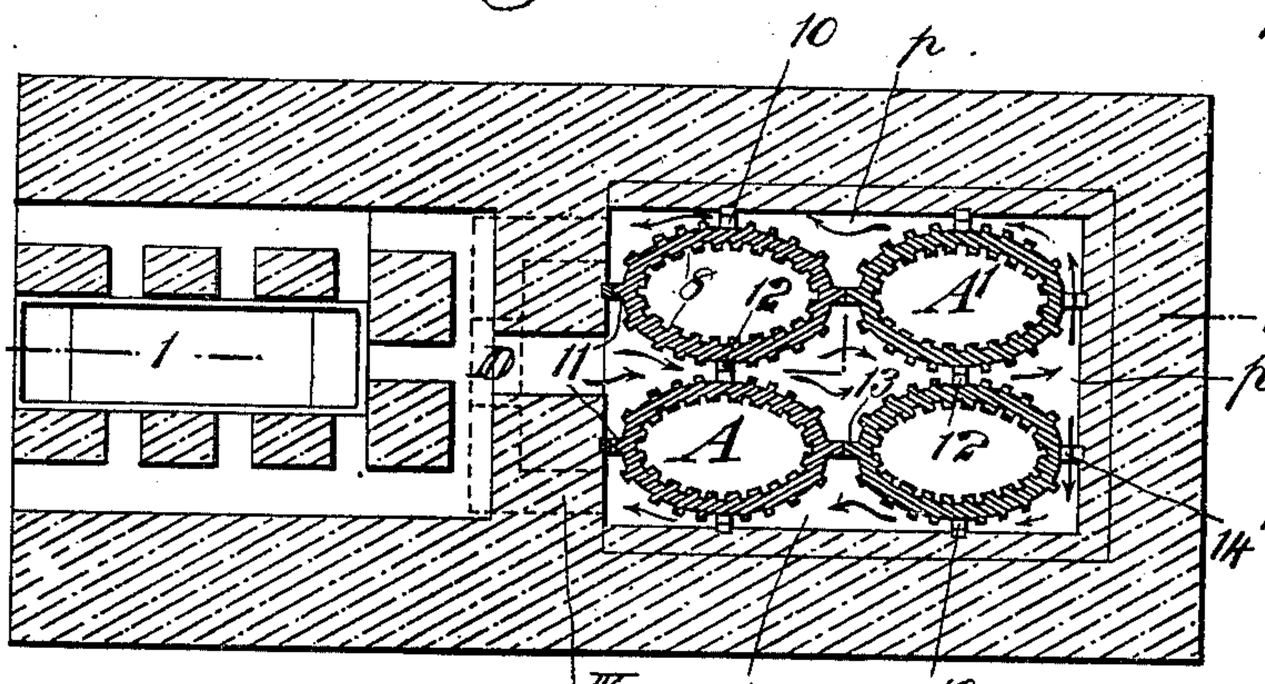


Fig. 2.



Witnesses:-

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Inventor:-

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UNITED STATES PATENT OFFICE.

CHARLES W. ISBELL, OF NEW YORK, N. Y.

GAS-RETORT.

SPECIFICATION forming part of Letters Patent No. 706,238, dated August 5, 1902.

Application filed August 21, 1901. Serial No. 72,782. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. ISBELL, a citizen of the United States, and a resident of the borough of Manhattan, in the city and State of New York, have invented a new and useful Improvement in Retorts for the Manufacture of Illuminating-Gas, of which the following is a specification.

This invention relates to upright gas-retorts; and it consists in the novel construction of such retorts as hereinafter described and claimed, the purpose and advantages of which will hereinafter appear.

In the accompanying drawings, forming part of this specification, Figure 1 represents a vertical section of an apparatus embodying my invention, taken in the line 1 1 of Fig. 2, which represents a horizontal section taken in the line 2 2 of Fig. 1; Fig. 3, a plan of one of the sections of which the upright retorts are built up; Fig. 4, a side elevation corresponding with Fig. 3.

Referring first to Figs. 1 and 2, A A′ designate the upright retorts, represented as arranged in two parallel rows within a heating-chamber B, of masonry, through which, between and around the retorts, the products of combustion from the furnace C circulate to the chimney D. The chambers and the retorts are represented as erected upon a floor-plate *a*, which is faced with fire-brick *b* and supported on beams *c*, which are themselves supported in part by columns *d* and in part by a structure of masonry, which includes the furnace C.

The retorts, which have single walls, may be of any suitable form in their horizontal section, though preferably elliptical, as shown in Figs. 2 and 3. They are represented as built up to a suitable height of a number of sections *e* of suitable material, as fire-clay, of convenient depth, each forming a complete portion of the height of the retort, the several sections being matched together by a tongue *f*, running around one and entering a corresponding groove in the next one, the matched joints thus formed being packed with asbestos or other suitable packing. The retorts thus built up have in their inner faces numerous upright grooves 8, which form spaces, into which the bituminous coal may expand as it does in its conversion into coke and which also serve as channels for the free upward exit of the gas generated in the retort. The said retorts have on their exteriors upright solid ribs 9, which constitute reinforcements to compensate for the weakening that would otherwise result from the grooving or channeling of the interior and also present increased heating-surfaces to the gases from the furnace C, which surround them within the heating-chamber. Besides the ribs 9 the said retorts have also on their exteriors more prominent ribs or projections 10 11 12 13 14, the said ribs 10 abutting against the side walls of the heating-chamber B, those 11 14 abutting against the end walls of said chamber, those 12 on the adjacent faces of the retorts of the two rows abutting together, and those 13 on the adjacent faces of the retorts of each row abutting together. The said ribs 10 11 12 13 14 constitute braces for the mutual bracing of the several retorts and the bracing of them against the walls of the heating-chamber B in such manner as to counteract any tendency to deformation of the retorts by the heat to which they are subject or by the expansion of the coal within them.

In order to provide for the circulation of the gases within and through the chamber B, between and around the retorts from the furnace C to the chimney D, as indicated by arrows in Fig. 2, the ribs 11 on the fronts of the front retorts A and the ribs 13 on the adjacent retorts of each row are made continuous from top to bottom of the retort; but the ribs 14 on the backs of the rear retorts A′ are interrupted at intervals, and so are the ribs 10 on those sides of all the retorts which are next the side walls of the chamber B and the ribs 12 between the retorts of the two rows. These interruptions, which form passages *p p* between the retorts themselves and between them and the walls of the chamber B, may be formed by making the ribs extend only part of the way up the retort-section, as illustrated by the ribs 10 in Fig. 4, or else by making an interruption 14* in the middle of the rib, as shown in the rib 14 in the same figure. With this construction of the retorts and their setting in the heating-chamber B, as shown in Fig. 2, the hot gaseous products of combustion from the furnace C entering the chamber B by the central flue *g* pass between the two

rows of retorts, thence outward in opposite directions around the backs of the retorts A′ of each row, thence forward between the two rows of retorts and the side walls of the chamber, and thence through the side flues K (shown in dotted outline in Figs. 1 and 2) to the chimney D, all as indicated by the arrows hereinbefore mentioned.

The bottoms of the retorts are represented as formed of hollow hinged lids *j*, on which are grates for the support of the coal. The heads L of the retorts are represented as of cast-iron and built upon and above the superposed sections *e* and furnished with sliding lids; but these bottoms, heads, and lids form no part of the present invention.

I have hereinbefore mentioned that the ribs 9 on the exteriors of retorts reinforce them and present additional heating-surfaces; but the said ribs presenting themselves across the passages formed horizontally, or approximately so, between the retorts themselves and between them and the walls of the heating-chamber B serve the additional purpose of intercepting the currents of the heating-gases passing through said passages in such manner that though they permit as active a circulation of said currents as is desirable they so retard the said currents as to obtain the utmost available heating effect of said gases on the retorts. The ribs 10 11 12 13 14 not only serve as braces by which the retorts brace each other and brace themselves laterally within the heating-chamber B, but by being made continuous or interrupted, as described, they provide passages for the heating-gases without any building or other construction of flues within the said chamber, and the only setting provided for the retorts is constituted by the outer walls and bottom of the said chamber.

What I claim is—

An upright gas-retort having a single wall in the inner surface of which are upwardly-running channels and on the outer surface of which are upwardly-running ribs, substantially as and for the purpose herein described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 19th day of August, 1901.

CHARLES W. ISBELL.

Witnesses:
FREDK. HAYNES,
GEORGE BARRY, Jr.