

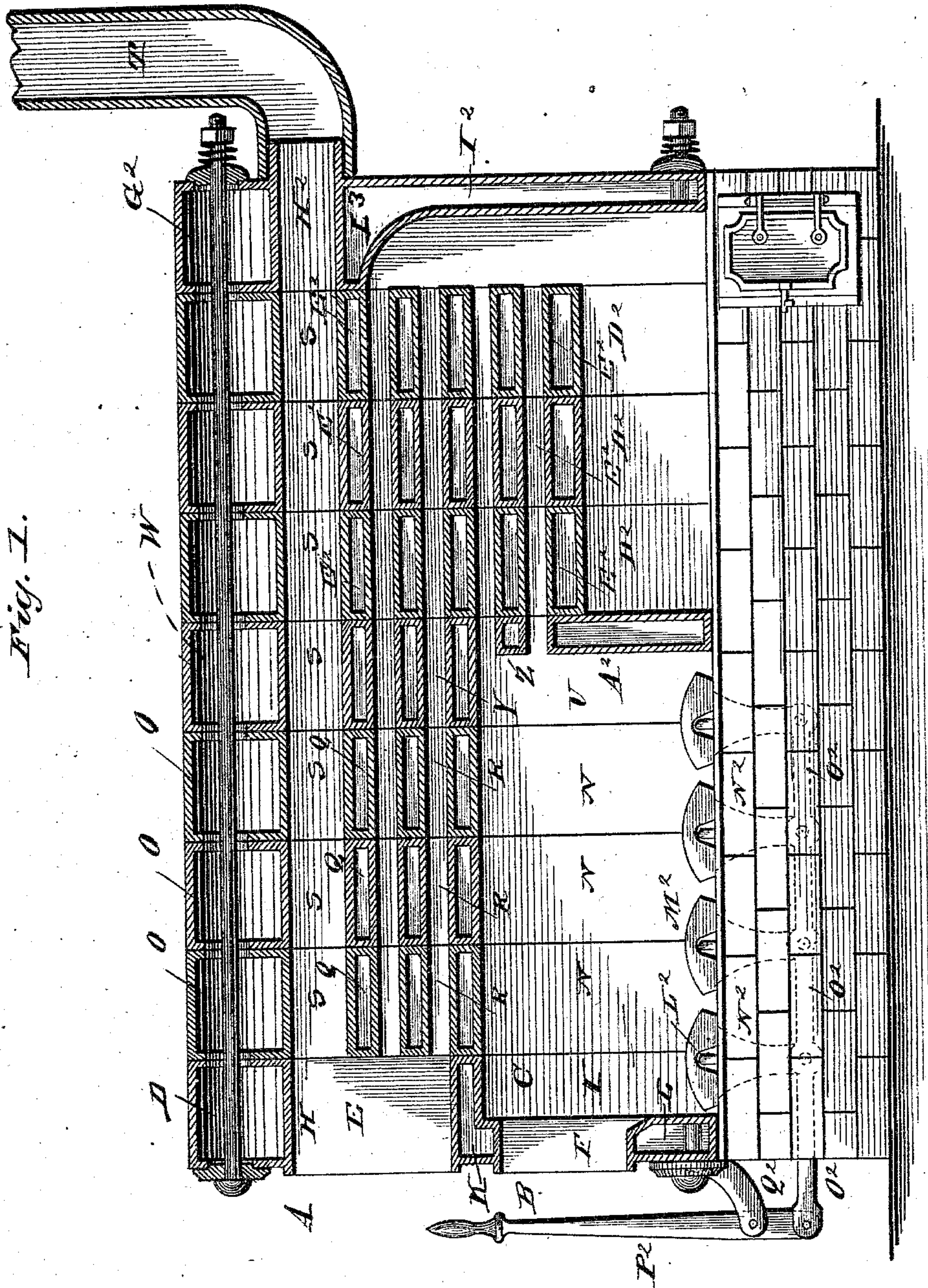
(No Model.)

3 Sheets—Sheet 1.

H. A. BARNARD.
SECTIONAL STEAM BOILER.

No. 295,328.

Patented Mar. 18, 1884.



WITNESSES

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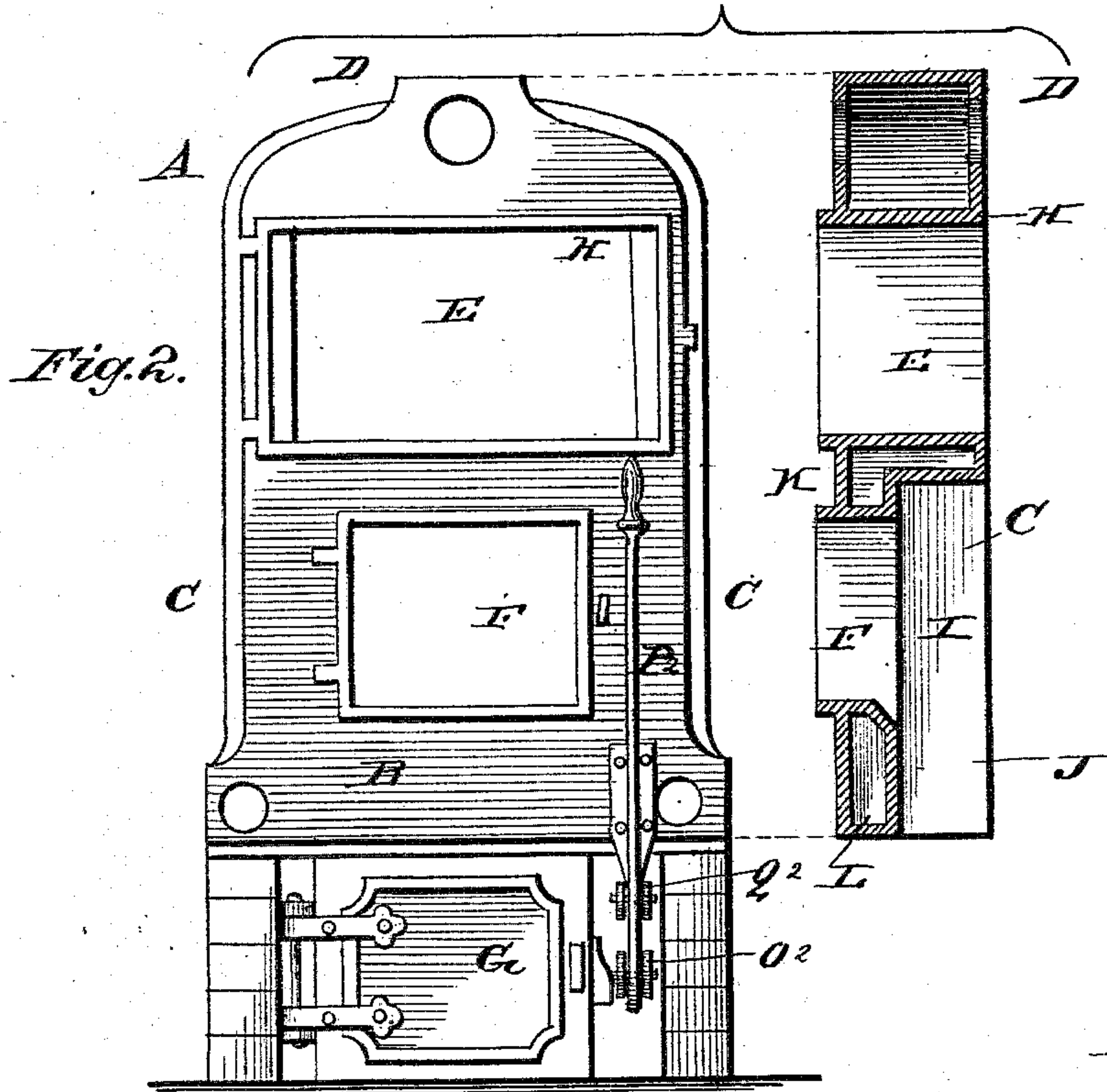
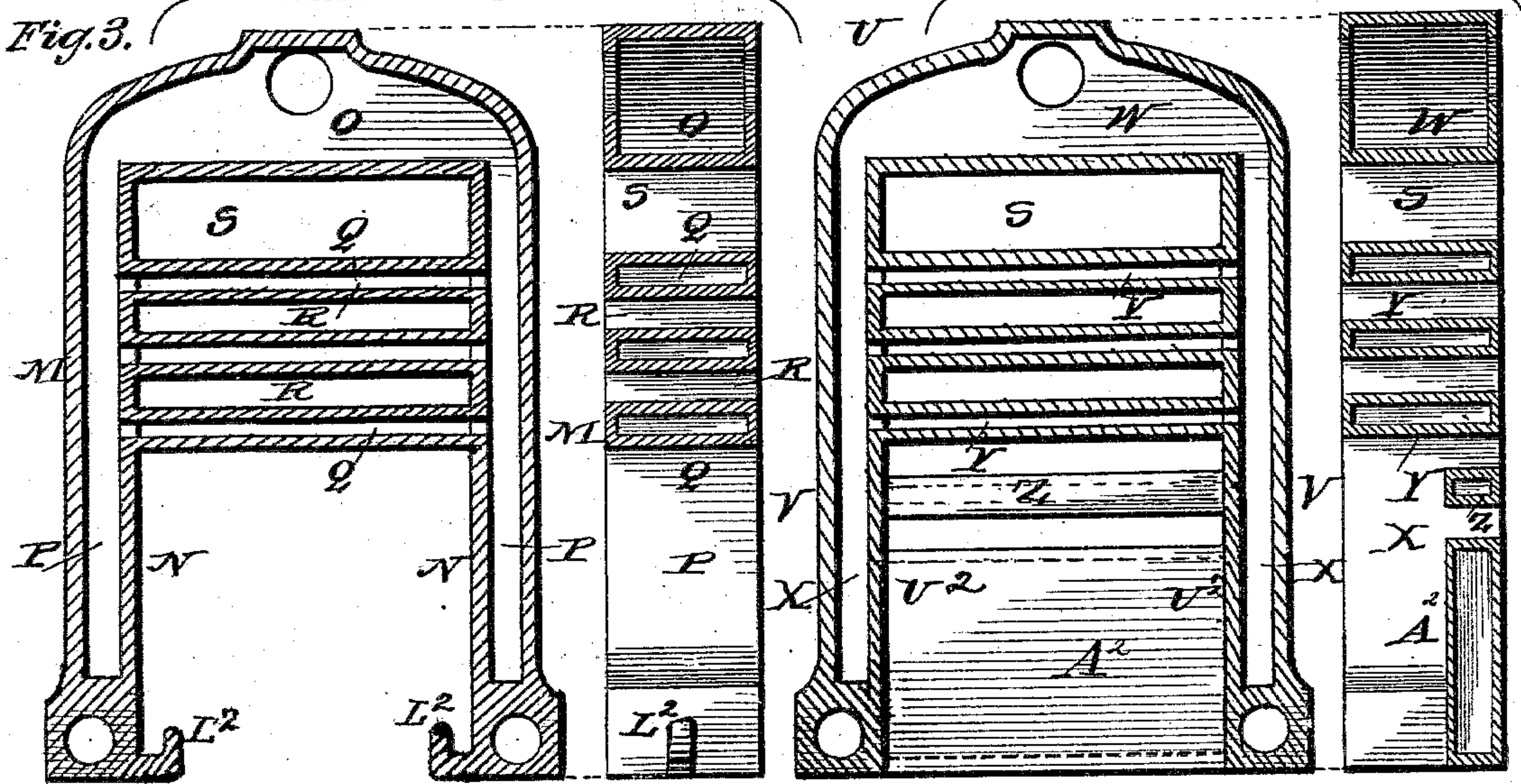


Fig. 4.



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Fig. 5.

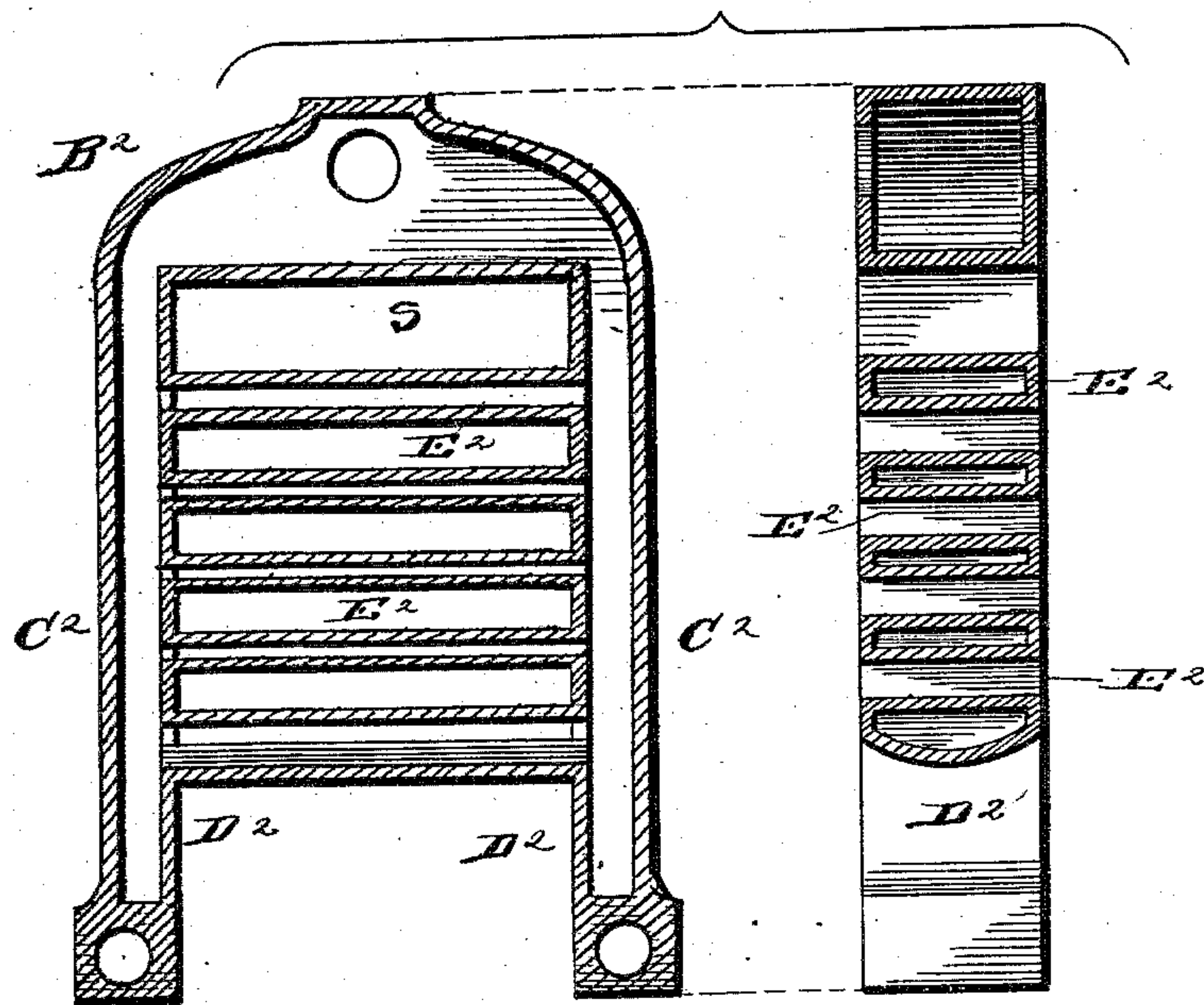
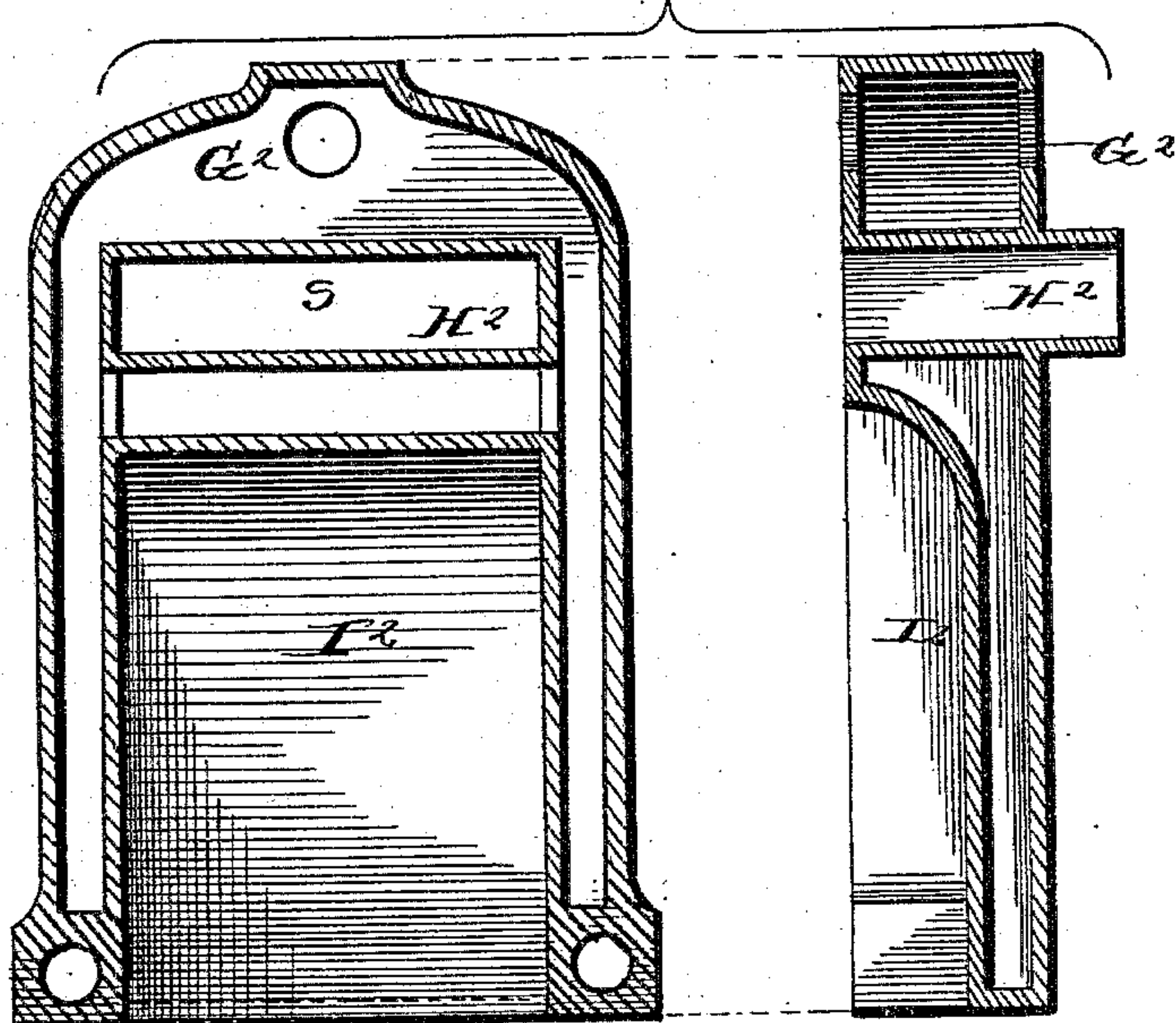


Fig. 6.



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UNITED STATES PATENT OFFICE.

HEMAN A. BARNARD, OF MOLINE, ILLINOIS.

SECTIONAL STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 295,328, dated March 18, 1884.

Application filed December 13, 1883. (No model.)

To all whom it may concern:

Be it known that I, HEMAN A. BARNARD, of the city of Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Sectional Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

This invention relates to sectional steam-boilers; and it has for its object to provide a device which shall be simple in construction and durable and effective in operation. To this end my invention consists in certain improvements in the construction of the said device, which will hereinafter be fully described, and particularly pointed out in the claims.

In the accompanying drawings I have illustrated the several parts or sections of which my invention is composed, as follows:

Figure 1 comprises a longitudinal sectional view of my improved sectional steam-boiler complete. Fig. 2 is a front view of the same. Fig. 3 is a longitudinal and a transverse sectional view of one of the sections ranging as second in my improved boiler. Fig. 4 comprises a longitudinal and a transverse sectional view of the third section of my improved boiler. Fig. 5 comprises a longitudinal view and a transverse section of one of the sections ranging as fourth in my improved boiler. Fig. 6 comprises a longitudinal view and transverse sectional view of the fifth and last section of my improved sectional boiler.

The same letters refer to the same parts in all the figures.

A designates the first or front section of my improved sectional boiler. This section comprises a front wall, B, side walls, C C, connected at their upper ends by the dome D, and provided with front doors, E, F, and G, which communicate, respectively, with the flue-chamber, the fire-box, and the ash-pit of the boiler. The steam-dome is separated from the flue-chamber by a transverse diaphragm, H, and the ends of the flue-chamber have vertical walls I, between which and the side walls of the front section, A, the water legs or spaces J are formed. Below the flue-chamber is constructed a transverse pipe, K, communi-

cating with the water-legs, and below and in front of said pipe is located the door F, through which access is had to the fire-box of the boiler. Below this is a transverse pipe, L, connected with the water-legs at the front end of the section A, and below this pipe is the door G of the ash-pit.

The second series of sections of my improved boiler comprise each the side walls M, inner walls N, forming the steam-dome O, and water-legs P, which are connected by transverse pipes or flues Q, between which the fire-flues R are located, the space between the upper pipes and the steam-dome being somewhat larger than the rest, so as to furnish what I call the "main fire-flue" S, which extends, as will be presently shown, through the entire length of the boiler, and communicates with the chimney or smoke-stack T. It will be seen that the transverse pipes Q occupy only the upper parts of the second sections, the lower parts of which, surrounded by their respective water-legs, form the main part of the boiler-fronts.

The third section of the boiler is indicated by letter U, and it comprises the side walls V, inner walls U', steam-dome W, and water-legs X, the said water-legs being connected by the transverse pipes Y, Z, and A², the former of which contribute, together with the flues of the first and second sections, to form the longitudinal fire-flues of the boiler, while the pipe A², being high and narrow, forms the back wall of the furnace.

B² designates one of several sections which are used in rear of the third section of the furnace, and which comprise side walls C², inner walls D², and transverse pipes E², connecting the sides or water-legs, and which register with the flues Q of the sections M, and with the flues Y, Z, and A² of the sections U of the boiler.

F² designates the rear section of the boiler, which is constructed with the steam-dome G², main flue H², and the back wall, I², which forms the water-back of the boiler, and the upper end of which extends forwardly over the combustion-chamber, as shown at I² in Fig. 1.

The several sections of the boiler are connected by means of longitudinal rods or bolts, for which suitable openings are provided in

the several sections, and which are fastened, by means of nuts and washers, in a well-known manner.

By this invention a boiler of any desired capacity may be easily and quickly constructed simply by using any desired number of the second and fourth sections herein described. The front section, it will be readily understood, is always unchanged. Of the second sections, the water-legs of which serve to form the furnace or combustion-chamber, any desired number may be used. The third section forms the back wall of the furnace, and is provided with a water-back, by which burning out of the said section is prevented. The following or fourth sections, of which any desired number may be used, contribute to the capacity of the water and steam reservoirs, and to the length of the fire-flues, thus providing an equal and strong draft. The last section of the boiler comprises, mainly, the back wall, which is in itself a water-reservoir communicating with the steam-dome, a flue-chamber into which the several flues open, and from which the products of combustion pass into the main flue and stack, and a chamber or receptacle having a door through which the soot and other deposits resulting from combustion may be easily removed. Each section comprised within the fire-box of my improved steam-boiler is provided with bearings L^2 , for a transverse slotted rocking grate-bar, M^2 . These several grate-bars are provided with downwardly-extending arms N^2 , connected by jointing-rods O^2 , the forward one of which is pivotally connected with the lower end of a handle-
 lever, P^2 , pivoted to a bracket, Q^2 , upon the front section of the boiler. It will be seen that by operating the said lever the several

grate-bar sections may be operated, and the fire thus raked or stirred.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of my invention will be readily understood. The device consists, practically, of only five sections, two of which may be multiplied indefinitely, so as to form a boiler of any desired capacity.

I claim as my invention and desire to secure by Letters Patent of the United States—

1. In a sectional steam-boiler, the herein-described front sections forming the fire-box, the said sections being constructed with the rests or bearings L^2 , in combination with the slotted grate-bars M^2 , mounted pivotally upon the said rests, and having downwardly-extending arms N^2 , the connecting-rods O^2 , and the operating-lever P^2 , pivoted to a bracket, Q^2 , upon the front section of the boiler, as set forth.

2. As an improvement in sectional steam-boilers, the combination of the herein-described front section having the steam-dome, combustion-chamber, transverse water-pipes, and front doors, the sections having steam-domes, water-legs, transverse pipes, and horizontal flues, the section comprising the water-back of the furnace, sections forming a continuation of the boiler, and a rear section having a water-back, a smoke-stack, and a soot-door, substantially as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HEMAN A. BARNARD.

Witnesses:

W. J. ENRIKIN,
 WM. C. BENNETT.