

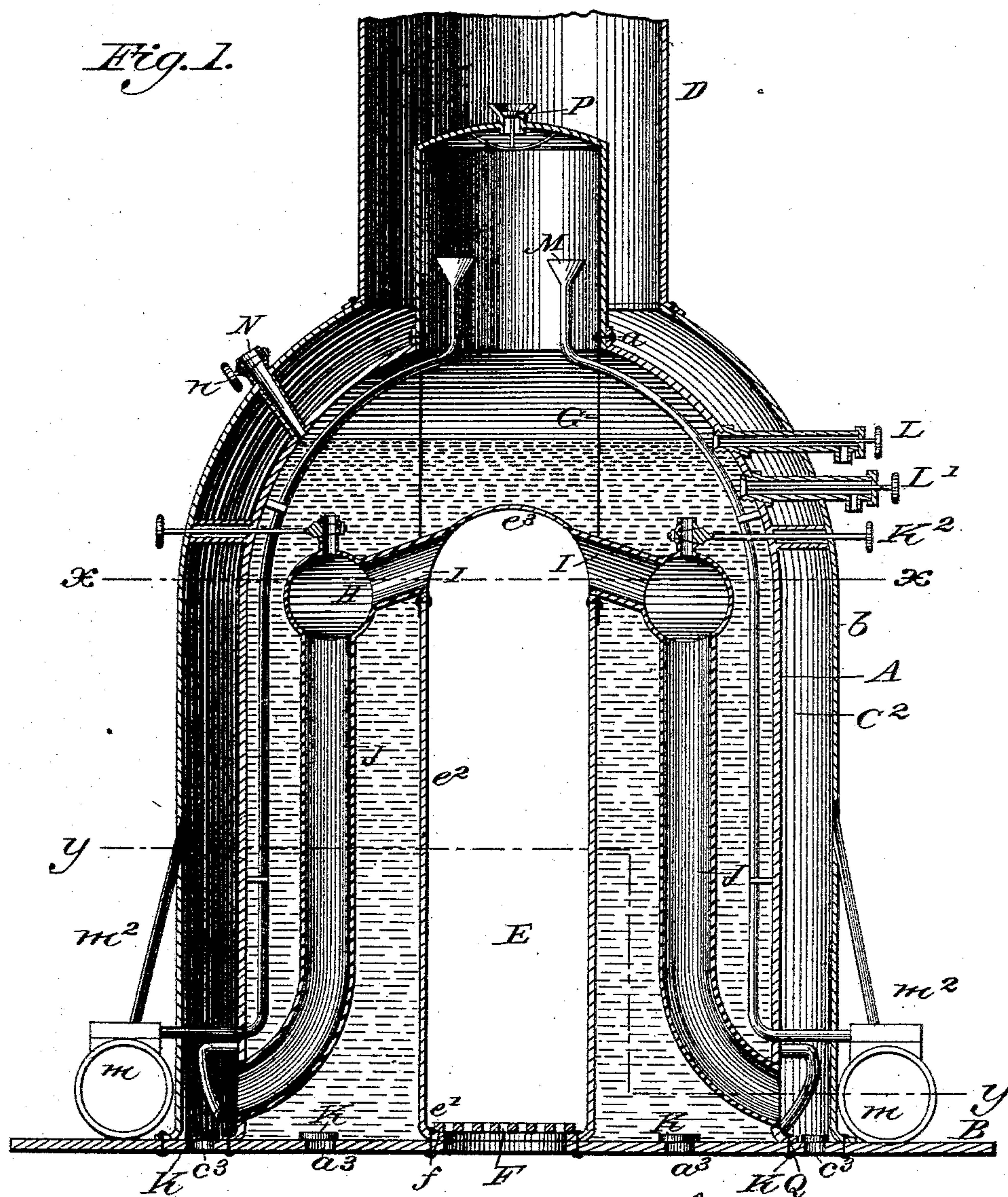
(No Model.)

2 Sheets—Sheet 1.

A. L. GILSTRAP.  
STEAM GENERATOR.

No. 399,259.

Patented Mar. 12, 1889.



Witnesses:  
R. S. Matthews  
W. J. Magee.

*Alma L. Gilstrap, Inventor.*



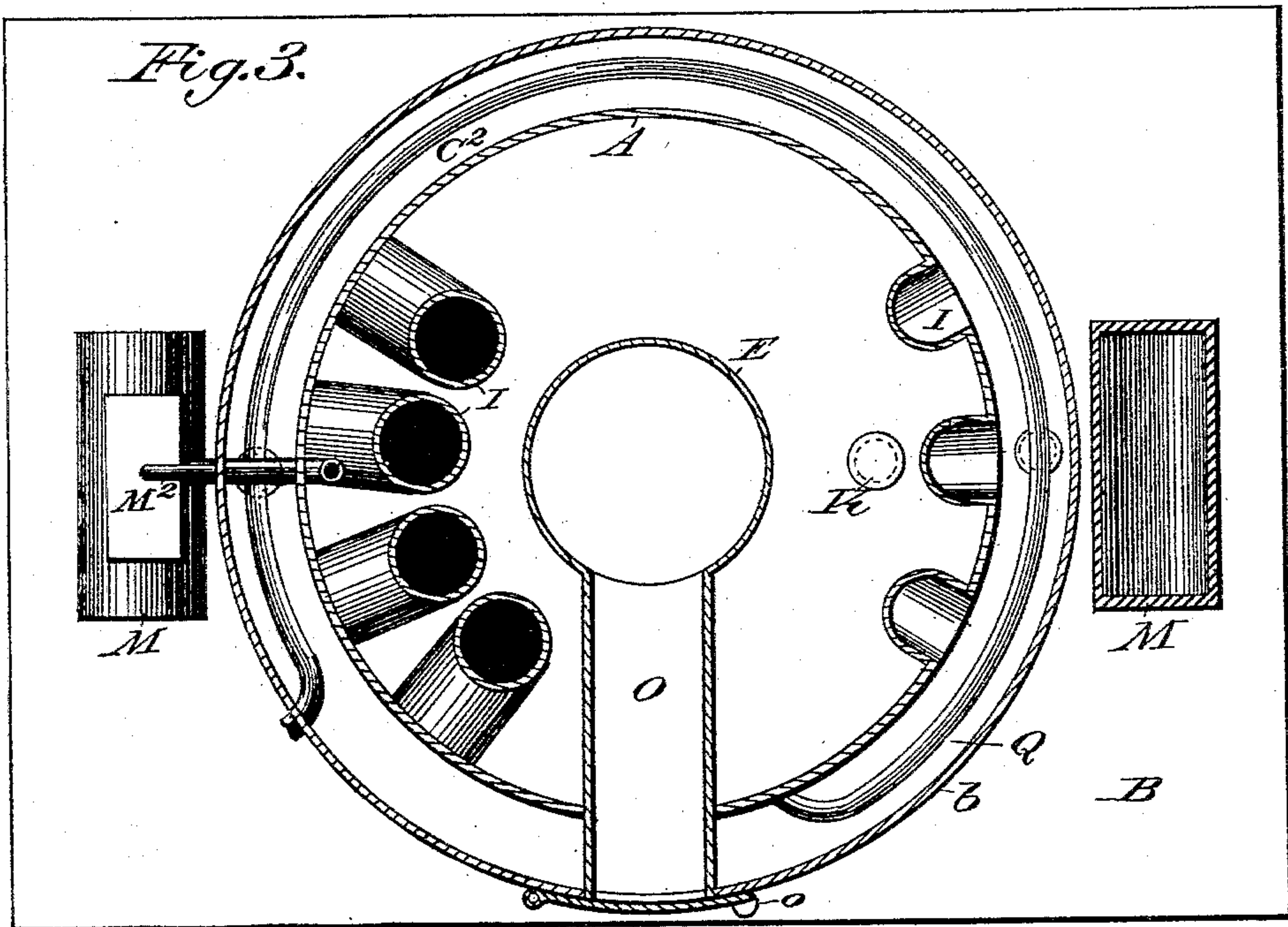
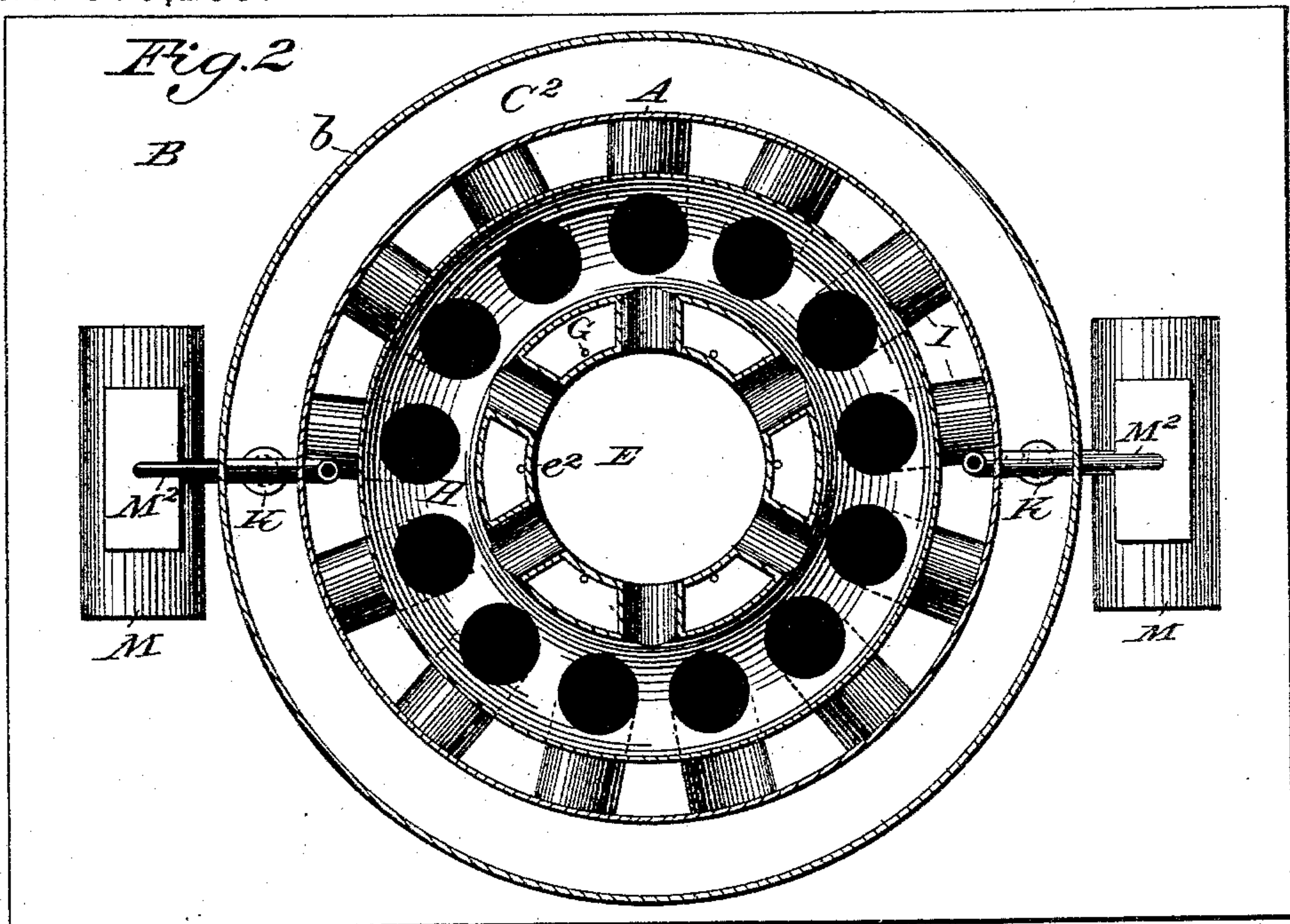
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# UNITED STATES PATENT OFFICE.

ABNER L. GILSTRAP, OF MACON, MISSOURI.

## STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 399,259, dated March 12, 1889.

Application filed October 12, 1887. Serial No. 252,189. (No model.)

*To all whom it may concern:*

Be it known that I, ABNER L. GILSTRAP, a citizen of the United States, residing at the city of Macon, in the county of Macon and State of Missouri, having invented certain new and valuable Improvements in Steam-Generators, I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to steam-generators by which steam-power is cheaply produced, fuel saved, and cinders prevented from escaping. These objects I attain by means of the device illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a vertical longitudinal section of a generator embodying my improvements. Fig. 2 is a cross-section upon the line  $x x$  of Fig. 1; and Fig. 3 is also a cross-section, near the base, on the line  $y y$  of Fig. 1.

Referring by letter to the drawings, A indicates the outer walls of the generator, secured to the base-plate B by means of bolts or rivets  $b$ , extending through the lower edge or rim of the outer walls, A, and base-plate B, the said walls A all around extending upward to a point at or near a horizontal line with the top of the furnace E, the elevation of which furnace extends up to or near the water-line, and may be any height desired, and from which horizontal line the walls A are curved inward and upward to a point,  $a$ , about vertical with the outside of the furnace E, (called "fire-box" in my patent, No. 365,000,) and from thence directly upward to any desired extent, and are provided with a suitable cap,  $a^2$ , concave on the under side.

C is a Howser covering extending around the walls A of the generator and secured to the base-plate B in a similar manner, and forming between it and the walls A a flue or space,  $c^2$ , around the walls A, extending upward and connecting with the smoke-stack, being identical with the smoke-stack D at the point  $c$  at or nearly on a horizontal line with the point  $a$  of the generator-walls A.

D is a smoke-stack, made of any desired size and shape.

E is a furnace placed inside and about the center of the walls A, and its sides  $e^2$  are secured to the base-plate B by means of a rim riveted or bolted thereto, preferably extending around the base of the furnace inside, forming a shoulder,  $e$ , on the base-plate around the inside of the furnace and an opening through the base-plate to receive a grate, F, the rim  $f$  of which rests on said shoulder at the lower end of the furnace.

The base-plate B is preferably square, but may be made of any desired form and thickness, with a hole through it about the center and under the furnace E and the grate F to permit the ashes and cinders to drop through from the furnace into an ash-box below and to admit a draft of air. To the upper end of the furnace is secured a cap,  $e^3$ , bolted or riveted on, concave on the under side. To the sides  $e^2$  on the outside are secured such number of rods or bars G as may be desired, connecting with the inside of the upper part of the walls A for the purpose of strengthening the generator.

H is an annular pipe-flue encircling the upper end of the furnace E midway between said furnace and the generator-walls A, and which is connected with the upper end of the furnace by a suitable number of pipe-flues, I, and by an increased number of descending pipe-flues, I', curved at the lower end and inserted through the generator-walls A, is connected with the flue  $c^2$  near its bottom, by which system of flues the fire-flame and hot air can pass from the furnace into the annular flue, preferably a larger flue than the pipe-flues I I, and from thence descend the pipe-flues I into the flue  $c^2$ , and from thence ascend around the walls A into and up the smoke-stack. To clean out the flues and water-spaces between them, openings are made down through the base-plate, which openings are indicated by  $c^3$  and  $a^3$ , each of which is supplied with the usual covering-plates, K, through which the ashes, cinders, soot, sediment, and water may be driven out of the generator.

At the top of the annular flue H, on one or more sides, as desired, are provided openings into said flue for admitting and shutting off water and steam when required to clean out



the generator and its system of flues. These openings are supplied with the usual stop-cocks,  $K^2$ , the turning-bar of which is passed through a tube inserted through the outer covering, C, the flue  $c^2$ , and the walls A, terminating in a handle outside of the Howser covering C. At and below the water-line in the generator two ordinary water-gages, L L', for showing the presence of water and steam, are inserted into and through the flue  $c^2$  and walls A.

Steam connecting-pipes M M are shown in Fig. 1 secured to the inside of the walls A A, and are used to conduct the steam from the dome of the generator to the engines  $m$   $m$  and by the escape-pipes  $m^2$  and  $m^2$  to conduct the steam from the engines into the Howser covering-flue  $c^2$ , and from thence up the smoke-stack D.

N is a reception-pipe having a stop-cock,  $n$ , in it, inserted into and through the flue  $c^2$  and the walls A on a level with the upper water-gage, as shown in Fig. 1, and is used for the purpose of filling the generator with water.

Over the base-plate and secured thereto, entering the flue  $c^2$  from the force-pump, and passing inside of that flue half-way or more around the walls A and entering through the same, is placed the supply-pipe Q, made in the usual manner and used to supply the generator with water when in use.

O is an opening into the furnace through which to place the fuel into the furnace, and

to this door is attached a shutter,  $o$ , and a steam-gage, P, is attached to the dome of the walls A to blow off steam when the pressure is too high.

Having thus described my invention, what I claim as new in elements and combinations is as follows:

1. In a steam-generator, the covering C, flue  $c^2$ , walls A, furnace E, annular flue H, and connecting-flues I J, water-feeders Q, braces G, plates K, and base-plate B, all arranged and constructed to operate in the manner described, and for the purposes set forth.

2. In a steam-generator, the combination of the furnace E with the annular flue H and its connecting-flues I J, the flues  $c^2$ , and covering C with the walls A, substantially in the manner and for the purposes set forth.

3. In a steam-generator, the combination of the furnace E with the annular flue H and its connecting-flues I J, the walls A, covering C, flue  $c^2$ , smoke-stack D, the braces G, the steam connecting-pipes M, the steam-engines  $m$ , the escape-pipes  $m^2$ , the base-plate B, water-feeders Q, reception-pipe N, the grate F, and the plates K, substantially for the purposes and in the manner set forth and described.

ABNER L. GILSTRAP.

Witnesses:

W. J. MAGEE,

R. S. MATTHEWS.