

**No. 621,114.**

**Patented Mar. 14, 1899.**

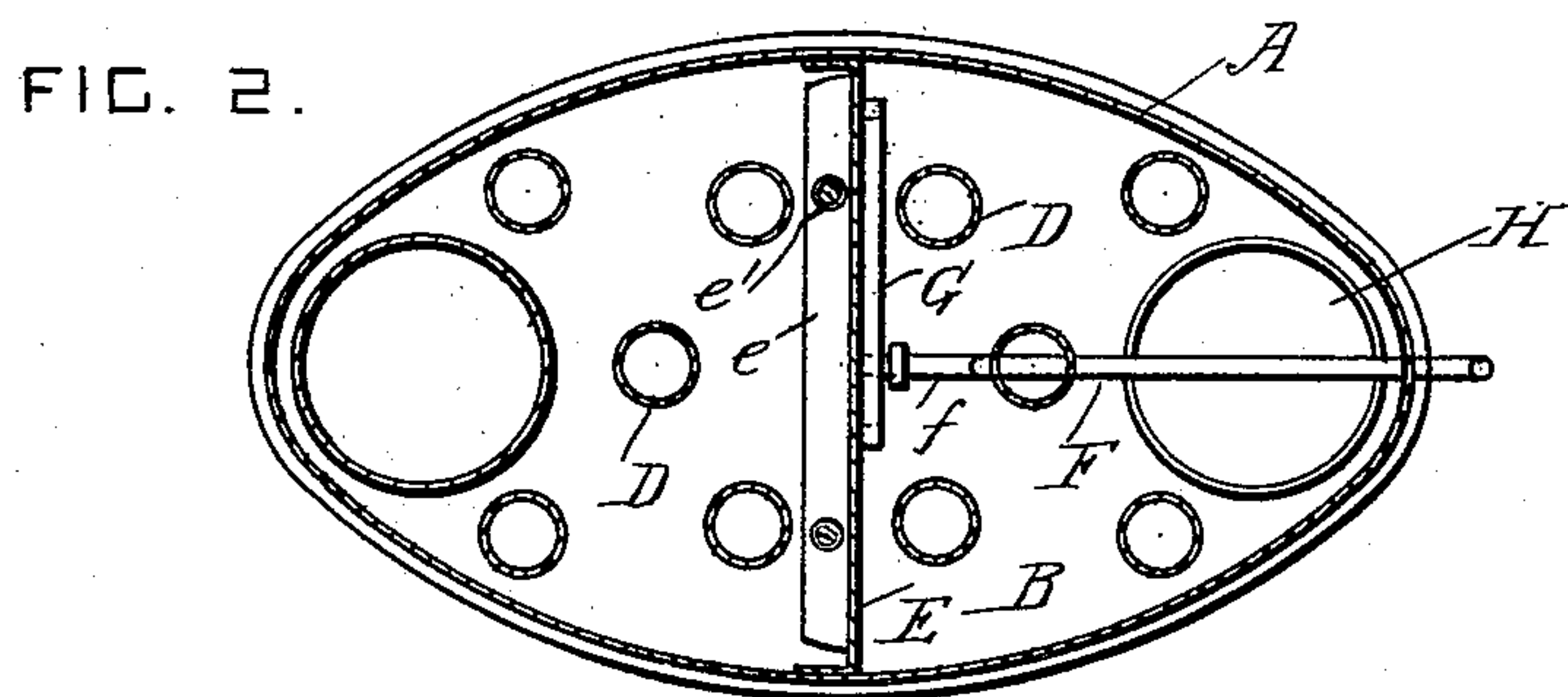
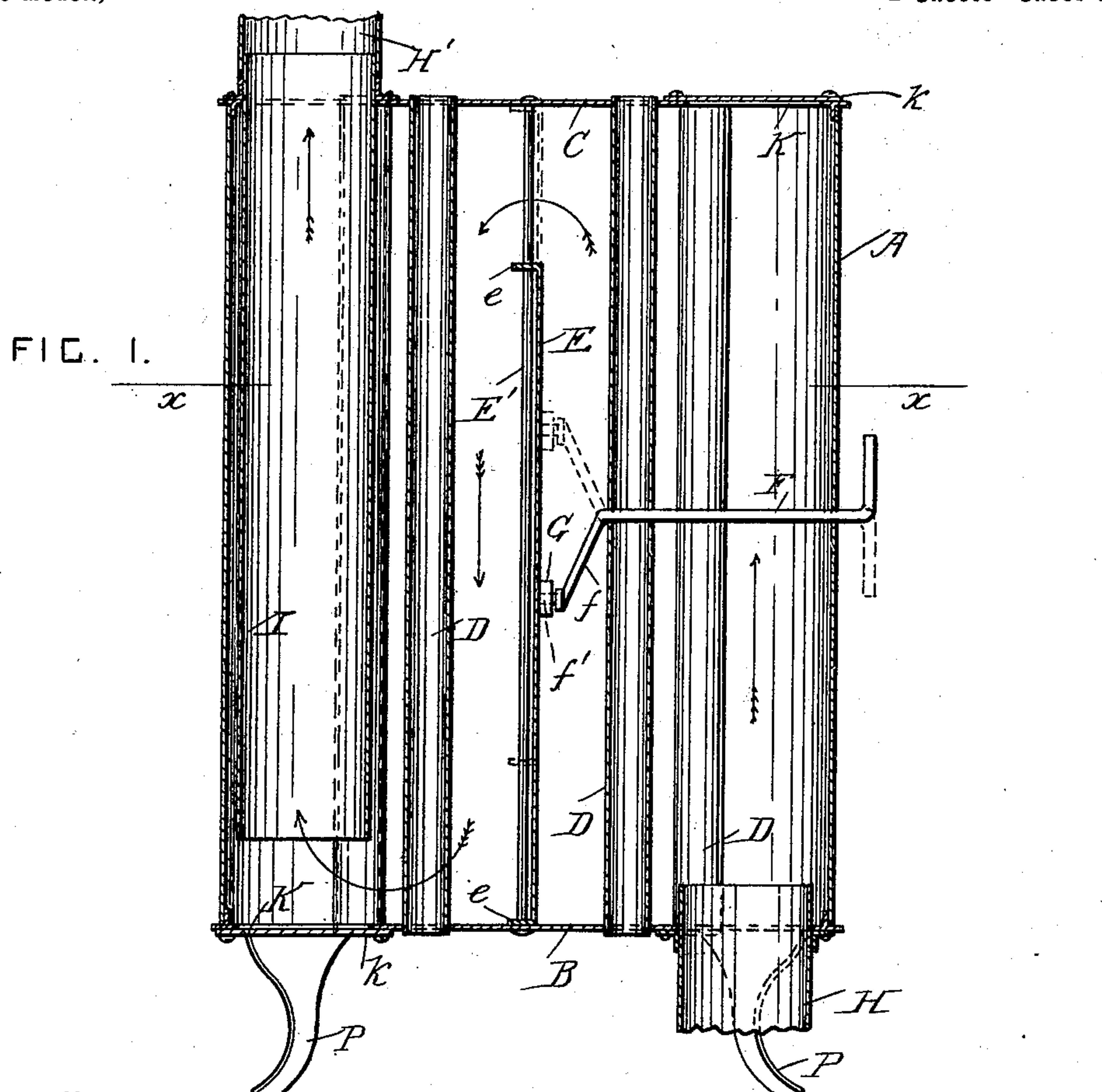
**N. MAINZ & G. J. ZELLER.**

## RADIATOR.

(Application filed Apr. 9, 1898.)

(No Model.)

**2 Sheets—Sheet 1.**



*WITNESSES,*

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2 Sheets—Sheet 2.

FIG. 4.

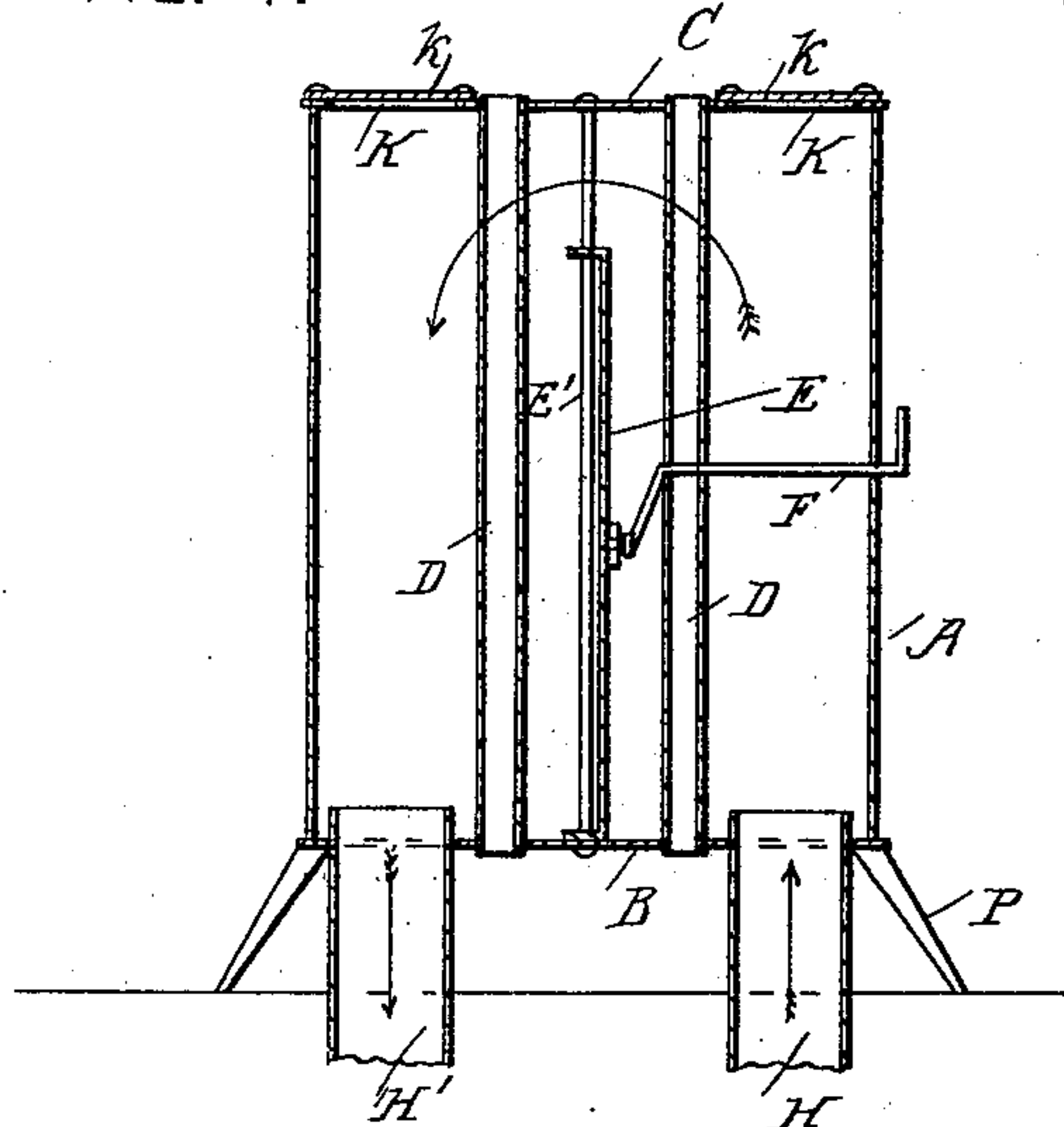


FIG. 5.

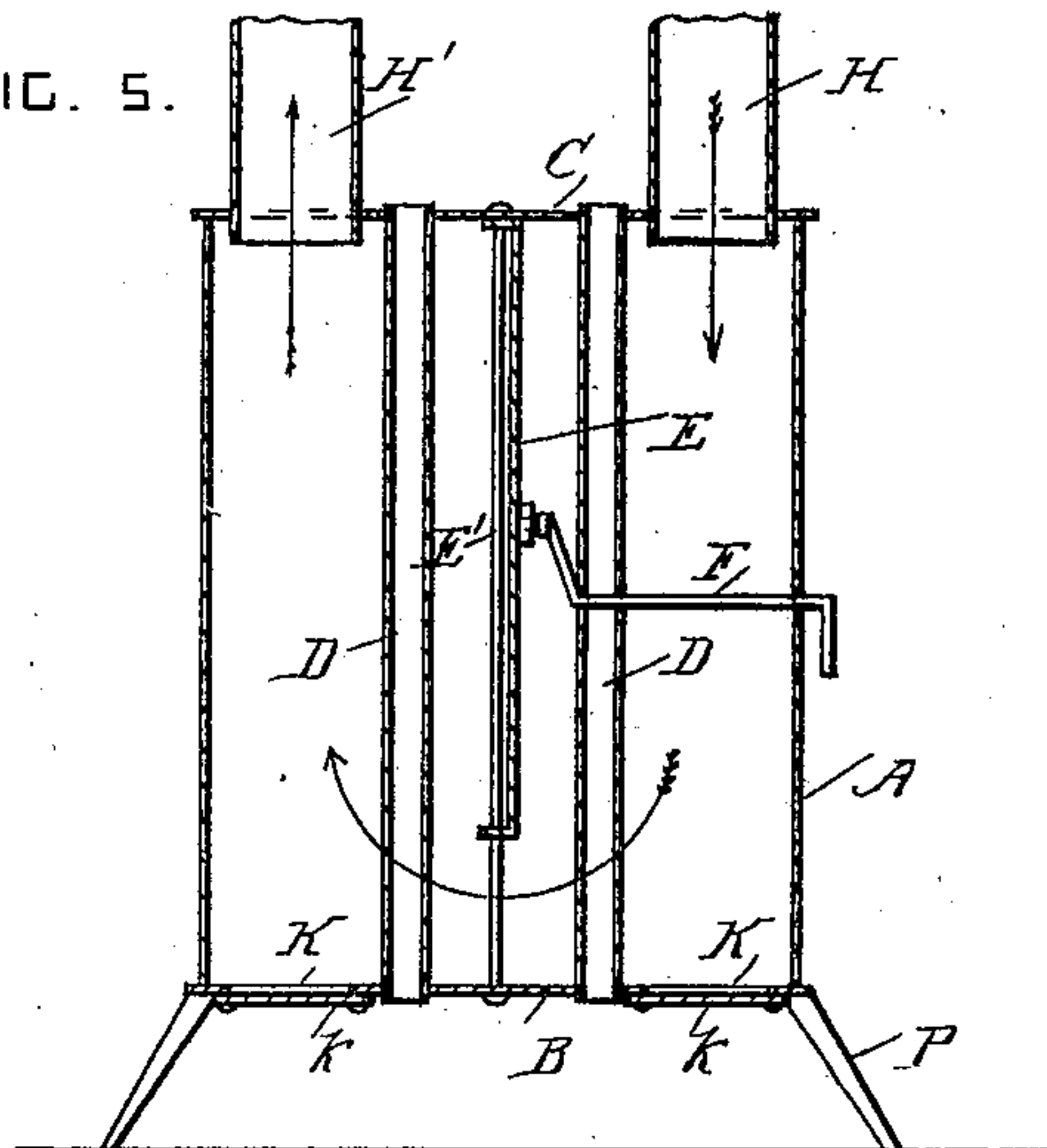
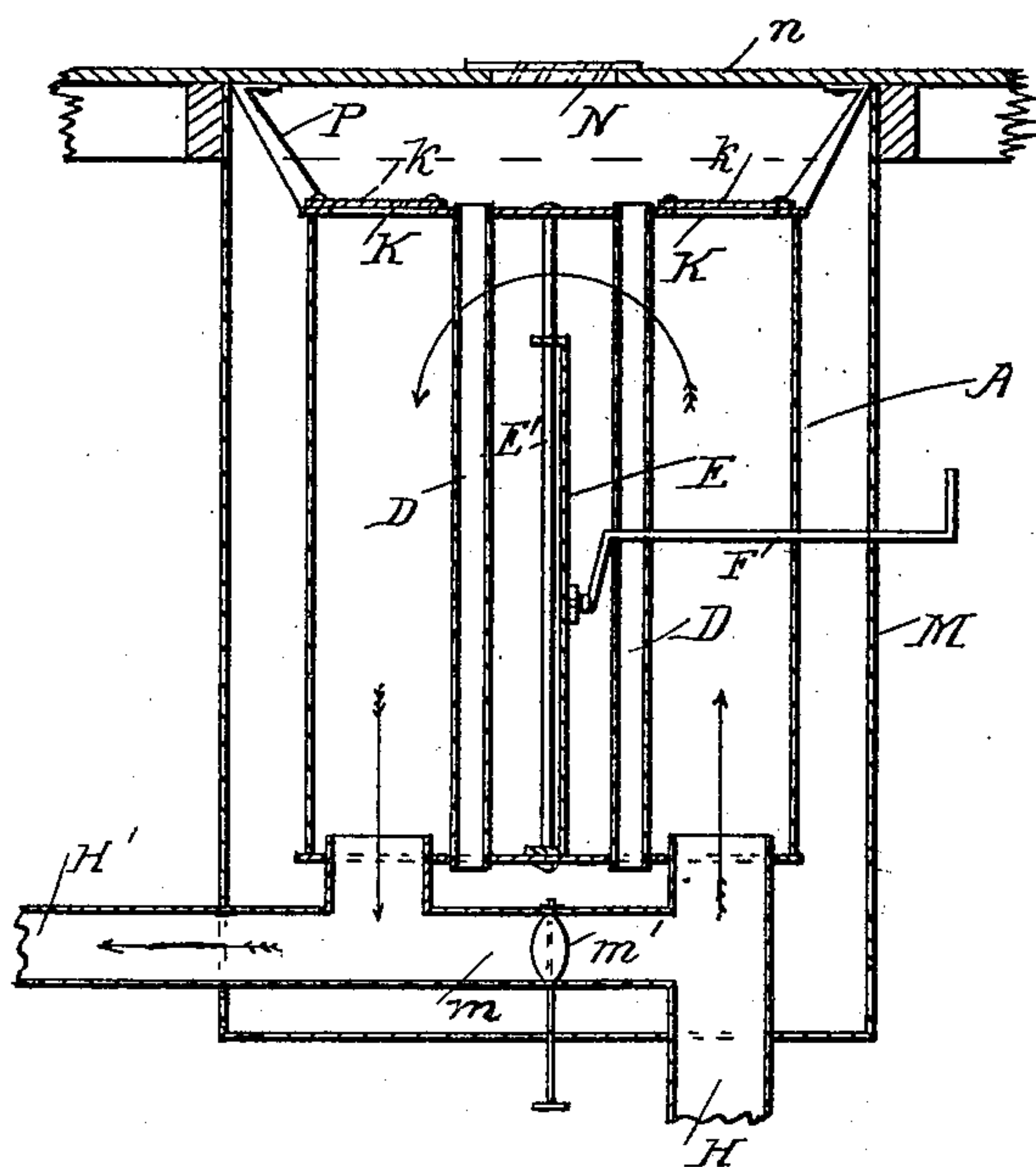


FIG. 6.



WITNESSES

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# UNITED STATES PATENT OFFICE.

NICHOLAS MAINZ AND GEORGE J. ZELLER, OF WASHINGTON HEIGHTS,  
ILLINOIS.

## RADIATOR.

SPECIFICATION forming part of Letters Patent No. 621,114, dated March 14, 1899.

Application filed April 9, 1898. Serial No. 677,021. (No model.)

*To all whom it may concern:*

Be it known that we, NICHOLAS MAINZ and GEORGE J. ZELLER, citizens of the United States, residing at Washington Heights, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Radiators; and we 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.

This invention relates to radiators; and it consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings, Figure 1 is a vertical section through the radiator. Fig. 2 is a sectional plan view taken on the line  $xx$  in Fig. 1. Fig. 3 is a detail view of a portion of the damper-plate. Figs. 4, 5, and 6 are vertical sections showing modifications of the radiator shown in Fig. 1.

A is the outer casing or shell of the radiator.

B is the bottom plate, and C is the top plate.

The top and bottom plates are secured to the shell in any approved manner. The shell is shown of oval form; but it may be made of any other approved form, such as rectangular or circular, and it and the top and bottom plates may be made of wrought-iron, cast-iron, or any other approved material which is a good conductor of heat.

D are vertical heating-tubes which pass through the radiator and have their end portions secured to the top and bottom plates in any approved manner.

E is a damper-plate or partition arranged crosswise of the shell and longitudinally between the heating-tubes at the middle part of the radiator. This damper-plate has flanges  $e$  at its top and bottom, and the said flanges have holes  $e'$ , so that they may slide freely upon vertical guide-rods  $E'$ , secured to the top and bottom plates. The rods  $E'$  also serve as stays or braces for the said top and bottom plates. The damper-plate is shorter than the shell of the radiator, and means for raising and lowering it are provided.

F is a crank-shaft which is journaled in bearings in one of the heating-tubes and in the radiator-shell, and  $f$  is the crank-arm, pro-

vided with a crank-pin  $f'$ , which engages with the horizontal slot of a guide or projection G on the damper-plate.

H is the inlet-pipe for the products of combustion or hot air from any approved form of heater, radiator, or furnace, and H' is the outlet-pipe. The pipes H and H' are arranged one on each side of the damper-plate and are connected to the radiator in any approved manner.

In the form of radiator shown in Fig. 1 the inlet-pipe is connected to the bottom plate and the outlet-pipe is connected to the top plate.

I is a removable portion of the outlet-pipe, which depends within the radiator. This pipe I may be a mere extension or prolongation of the outlet-pipe; but it is preferably a separate extension-pipe connected to the outlet-pipe proper. The opening or open end of the pipe I is arranged near the bottom plate.

The hot products of combustion pass through the radiator in the direction of the arrows shown in full lines when the damper-plate is lowered, and the shell and heating-tubes are heated for their full heights and form heating-surfaces for the surrounding air which is in contact with them.

When the damper-plate is raised to the position shown in dotted lines, the hot products of combustion pass under it and are not forcibly brought in contact with the upper parts of the heating-tubes or shell. The damper-plate can be supported in intermediate positions, if desired, so as to regulate the heat imparted to the surrounding air. A single damper suffices to regulate the heat, and the draft or outlet can never be obstructed or diminished by it.

In order that the radiator may be applicable to various situations, openings K are formed in the top or bottom plates, or in both plates, opposite the openings where the ends of the inlet and outlet pipes are connected to the plates. Each opening K is provided with a cover  $k$  for closing it when not in use, and when the inlet or the outlet pipe is removed the opening from which it is disconnected is covered by a similar cover  $k$ . The outlet-pipe of the radiator is connected to a flue or chimney, or it may be connected to another radiator, of which it then forms the inlet-pipe,



and as many radiators as desired can be joined together in a series in the same room or in the different rooms of a building.

In the modification shown in Fig. 4 the inlet and outlet pipes are both connected to the bottom plate and the openings in the top plate are closed.

In the modification shown in Fig. 5 the inlet and outlet pipes are both connected to the top plate and the openings in the bottom plate are closed.

In the modification shown in Fig. 6 the inlet and outlet pipes are both connected to the top plate of the radiator, but the radiator is inverted and supported from the ceiling of the room.

M is an outer casing for the radiator, and *m* is a short pipe which forms a direct connection between its inlet and outlet pipes. A damper *m'* is arranged in the pipe *m* so that the products of combustion can be led direct from the inlet-pipe into the outlet-pipe, if desired.

N is a heating-register in the ceiling or floor *n*, to which the radiator is secured, so that the room above that in which the radiator is located may be heated.

In order that the air may have free access to the heating-tubes, supports or legs P are provided. These supports or legs are of any approved construction and are secured to the radiator and to the floor or ceiling of the room, according to the position in which the radiator is placed.

What we claim is—

1. In a radiator, the combination, with a

chamber provided with a top plate and a bottom plate, of a partition slidable between the said top and bottom plates and having the extent of its motion limited by them, guides for the said partition, means for sliding the partition, and inlet and outlet pipes connected to the said chamber on opposite sides of the said partition, substantially as set forth.

2. In a radiator, the combination, with a chamber provided with an inlet and an outlet, and guide-rods secured in the said chamber; of a damper-plate arranged between the said inlet and outlet and provided with flanges which slide on the said guide-rods; and means for sliding the said damper-plate, substantially as set forth.

3. In a radiator, the combination, with a chamber provided with a top plate and a bottom plate each of the said plates having two openings for flue-pipes; of a partition slidable between the said plates and having the extent of its motion limited by them, guides for the said partition, means for sliding the said partition, an inlet and an outlet flue-pipe connected to two of the said openings on opposite sides of the said partition, and cover-plates closing the remaining two openings, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

NICHOLAS MAINZ.  
GEORGE J. ZELLER.

Witnesses:

WILLIAM ROACH,  
JOE STEPP.