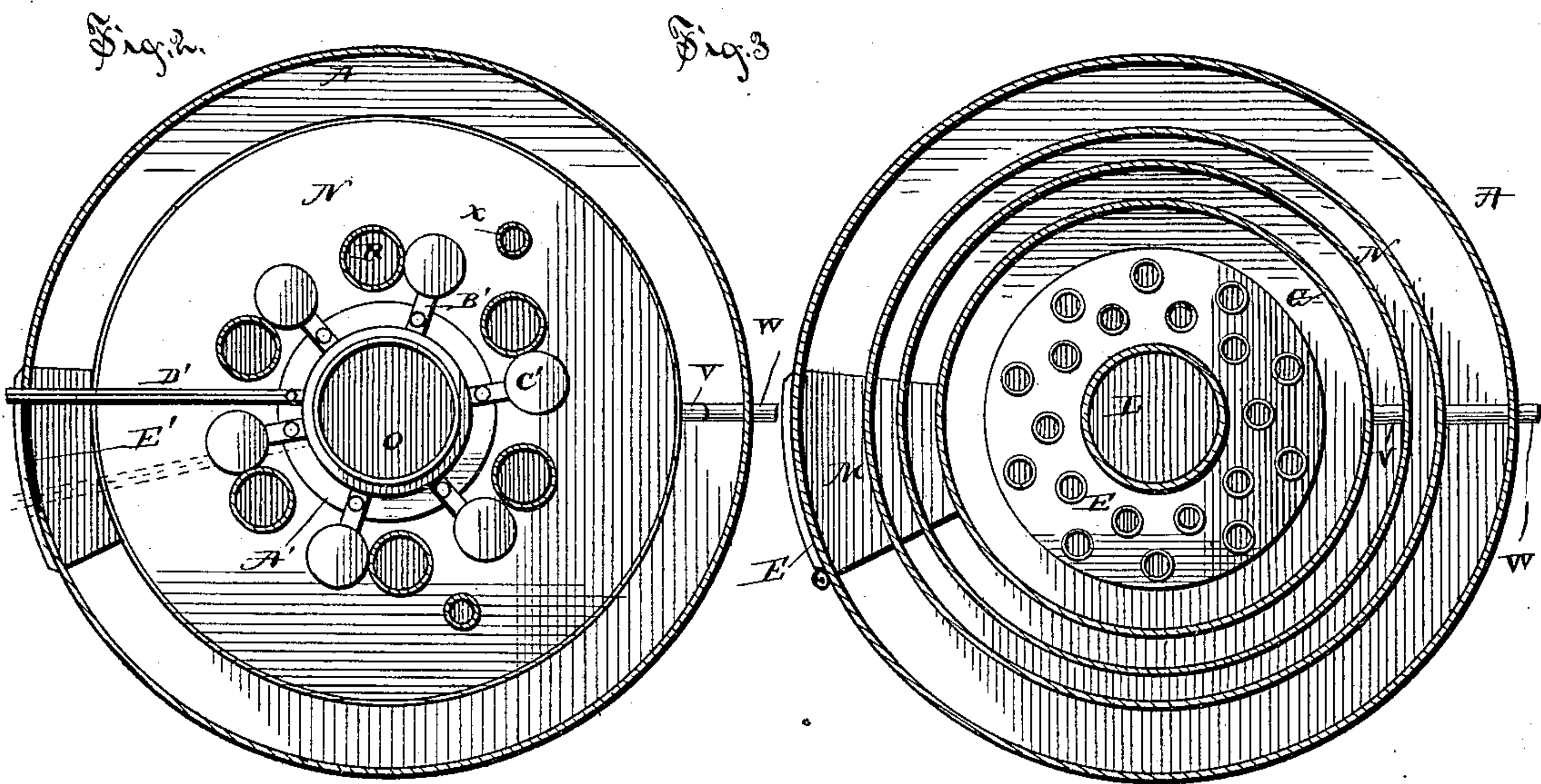
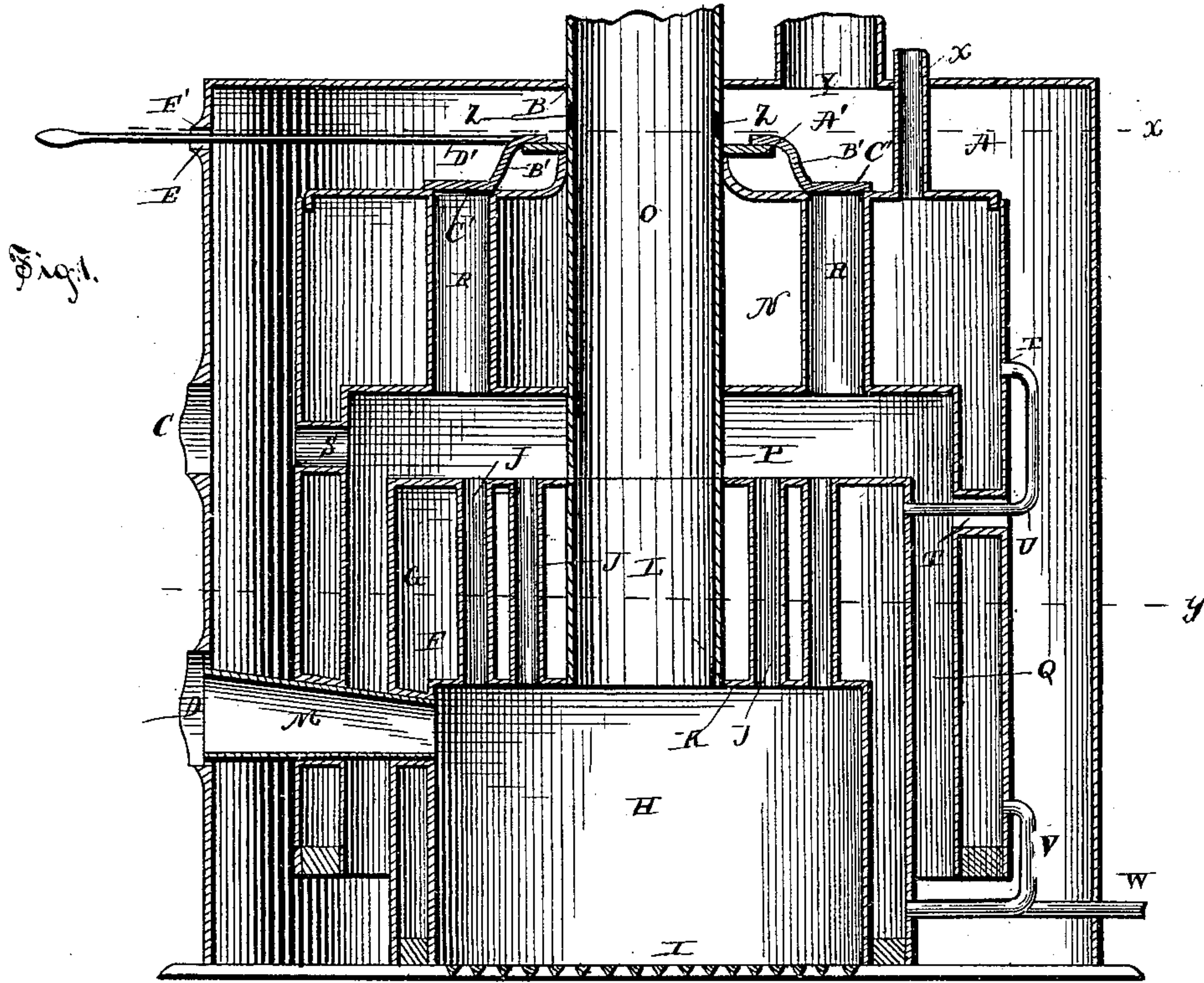


(No Model.)

J. WALP.
STEAM GENERATOR.

No. 353,996.

Patented Dec. 7, 1886.



WITNESSES
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UNITED STATES PATENT OFFICE.

JAMES WALP, OF LEHIGHTON, PENNSYLVANIA.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 353,996, dated December 7, 1886.

Application filed April 14, 1886. Serial No. 198,823. (No model.)

To all whom it may concern:

Be it known that I, JAMES WALP, a citizen of the United States, and a resident of Lehigh-
ton, in the county of Carbon and State of Penn-
sylvania, have invented certain new and useful
Improvements in Steam-Generators; and I do
hereby declare that the following is a full,
clear, and exact description of the invention,
which will enable others skilled in the art to
10 which it appertains to make and use the same,
reference being had to the accompanying draw-
ings, which form a part of this specification,
and in which—

Figure 1 is a vertical sectional view of my
15 improved steam-generator. Fig. 2 is a hori-
zontal sectional view of the same on line *x x*,
Fig. 1; and Fig. 3 is a similar view on line *y y*,
Fig. 1.

Similar letters of reference indicate corre-
20 sponding parts in all the figures.

My invention has relation to steam-genera-
tors; and it consists in the improved construc-
tion and combination of parts of a steam-
generator having a lower boiler provided with
25 a furnace and with vertical flues, and an up-
per boiler having an annular portion sur-
rounding the lower boiler, and having a num-
ber of vertical flues, forming a space between
it and the lower boiler, as hereinafter more
30 fully described and claimed.

In the accompanying drawings, the letter A
indicates the outer casing or shell of the boiler,
which is cylindrical and provided with an ap-
erture, B, in the center of its top, and with a
35 man-hole or hand-hole, C, in one side, and an
aperture, D, for the furnace-door E.

The lower boiler, F, consists of an annular
portion, G, surrounding the furnace or fire-
place H, which is provided at its bottom
40 with a grate, I, of suitable construction, and
the upper portion of the lower boiler is pro-
vided with a series of vertical flues, J, open-
ing through the crown-sheet K of the furnace,
and opening at the top of the boiler, being ar-
45 ranged in concentric circles around the cen-
tral cylindrical magazine, L, which extends
through the top of the lower boiler. The
chute M, which extends from the furnace-door
into the furnace, passes through the annular
50 portion of the lower boiler.

The upper boiler consists of an upper por-
tion, N, which is constructed with a central cy-

lindrical magazine, O, which extends through
the top of the outer shell or casing and down-
ward, forming a flange, P, resting upon the 55
upper end of the lower magazine, and of a
lower annular portion, Q, which surrounds
the lower boiler, forming a space between it,
and extending to a short distance from the
bottom of the shell, forming a space between 60
the said bottom and its lower end. The upper
portion of the boiler is formed with a series of
vertical flues, R, and the chute leading from the
furnace-door into the furnace passes through
the lower end of the annular portion of the 65
upper boiler.

The annular portion of the upper boiler is
formed with an aperture, S, which registers
with the hand or man hole in the outer shell,
and which admits of the space between the 70
top of the lower boiler and the bottom of the
upper boiler being cleaned through the aper-
ture. The annular portion of the upper
boiler is also formed with apertures T, through
which pass curved pipes U, the upper ends of 75
which open in the upper portion of the upper
boiler, while their lower ends, after passing
through the apertures in the annular portion
of the upper boiler, open into the upper end
of the lower boiler. The lower portion of the 80
annular portion of the upper boiler is also
provided with pipes V, which open in the
said end, and open into the lower end of the
annular portion of the lower boiler, passing
under the lower end of the annular portion of 85
the upper boiler, and one of these pipes has the
feed-pipe W opening into it.

The steam-pipe X opens at the upper por-
tion of the upper boiler and passes through
the top of the shell, and the smoke-flue or 90
smoke-stack Y opens at the upper end of the
shell.

The upper magazine, which passes through
the top of the shell at its center, and which
is provided with a suitable cover, is provided 95
with a series of apertures, Z, opening into the
space between the top of the shell and the top
of the upper boiler, and the gas which will
accumulate in the magazine may escape into
the smoke-space through these apertures, and 100
thus be carried off. A ring, A', fits and turns
upon the magazine above the top of the upper
boiler, and this ring is provided with a num-
ber of radiating arms, B', which are formed

with damper-plates C' upon their ends, which may cover the upper ends of the flues in the upper boiler, and a handle, D', or lever is secured to the ring and projects out through a horizontal slot, E', in the shell, the said slot having a plate, F', covering it and sliding with the handle, and it will be seen that by shifting the said handle the dampers may be slid, together with the ring which turns upon the magazine, so that the upper ends of the flues in the upper boiler may either be covered or uncovered.

The furnace is fed by the magazine, which is filled, and which will allow the fuel to pass down into the furnace in the same manner as in a base-burner stove, and the draft may be regulated by suitable draft-apertures in the ash-pit and by the furnace-door, and the products of combustion will pass from the fire up through the vertical flues in the lower boiler, heating the water in this boiler.

If the dampers are closed, the draft, with the products of combustion, will pass down under the lower end of the annular portion of the upper boiler, and thereupon upward between the shell and the boiler and out through the smoke-pipe; but if the dampers are open the draft will pass directly up through the upper boiler, through the vertical flues of the same, and out at the smoke-pipe.

The water from the upper boiler will pass down into the lower boiler and be heated, and will be forced again into the upper boiler, thus circulating through the communicating-pipes, and the steam collected in the upper portion of the upper boiler will be superheated by the products of combustion passing around and over the said boiler or through the flues of the same, so that the water will principally be boiled in the lower boiler and in the lower portion of the upper boiler, and the steam will collect in the upper portion of the upper boiler and be superheated there.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a steam-generator, the combination of a lower or inner boiler having the furnace within it, and having vertical flues, an upper or outer boiler having an upper portion placed some distance above the lower boiler, and an annular lower portion surrounding the lower

boiler and reaching to a short distance above the bottom of the lower boiler, and formed with a number of vertical flues in the upper portion, a shell surrounding the boilers and having the smoke-stack opening into it, and a number of dampers covering the upper ends of the flues of the upper boiler, and having means for operating them simultaneously, as and for the purpose shown and set forth.

2. In a steam-generator, the combination of a boiler portion having a number of flues arranged in a circle, and having a central magazine, with a ring turning upon the magazine, and provided with a number of radiating arms provided with damper-plates fitting over the ends of the flues, and having an arm or handle for turning it, as and for the purpose shown and set forth.

3. In a steam-generator, the combination of a lower boiler having an upper portion provided with vertical flues and with a central magazine, and having a lower annular portion surrounding the furnace, an upper boiler consisting of an upper portion having a circular series of vertical flues, and a central magazine having its lower end extended and resting upon the upper end of the lower magazine, and having a lower annular portion surrounding the lower boiler and extending to a distance from the bottom of the same, pipes connecting the upper and lower portions of the boilers, an outer shell or casing surrounding the boilers, forming a space between them, and having a smoke-stack opening at its top, and having a furnace-door at its lower portion, provided with a chute-opening through the annular portions of the boilers into the furnace, and a ring turning upon the upper end of the upper magazine in the space between the shell and the top of the upper boiler, and having radiating arms provided with damper-plates covering the upper ends of the flues of the upper boiler, and having a handle sliding in a slot in the shell, as and for the purpose shown and set forth.

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

JAMES WALP.

Witnesses:

SAMUEL WALP,
J. A. WALP.