

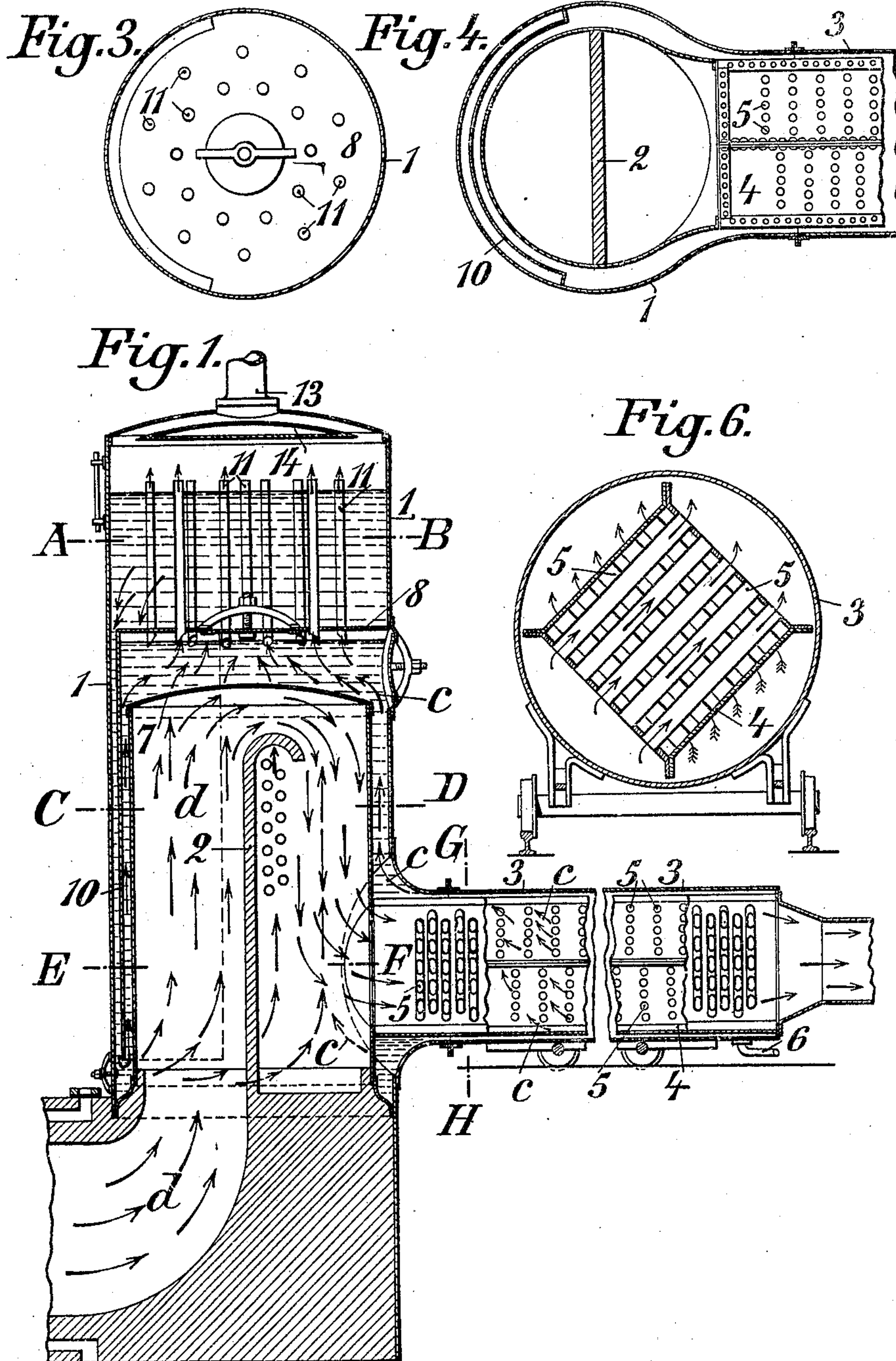
No. 835,872.

PATENTED NOV. 13, 1906.

P. SSIWAY.
STEAM BOILER.

APPLICATION FILED JULY 17, 1906.

2 SHEETS—SHEET 1.



WITNESSES

H. Schneider

Henry Schreiber

INVENTOR

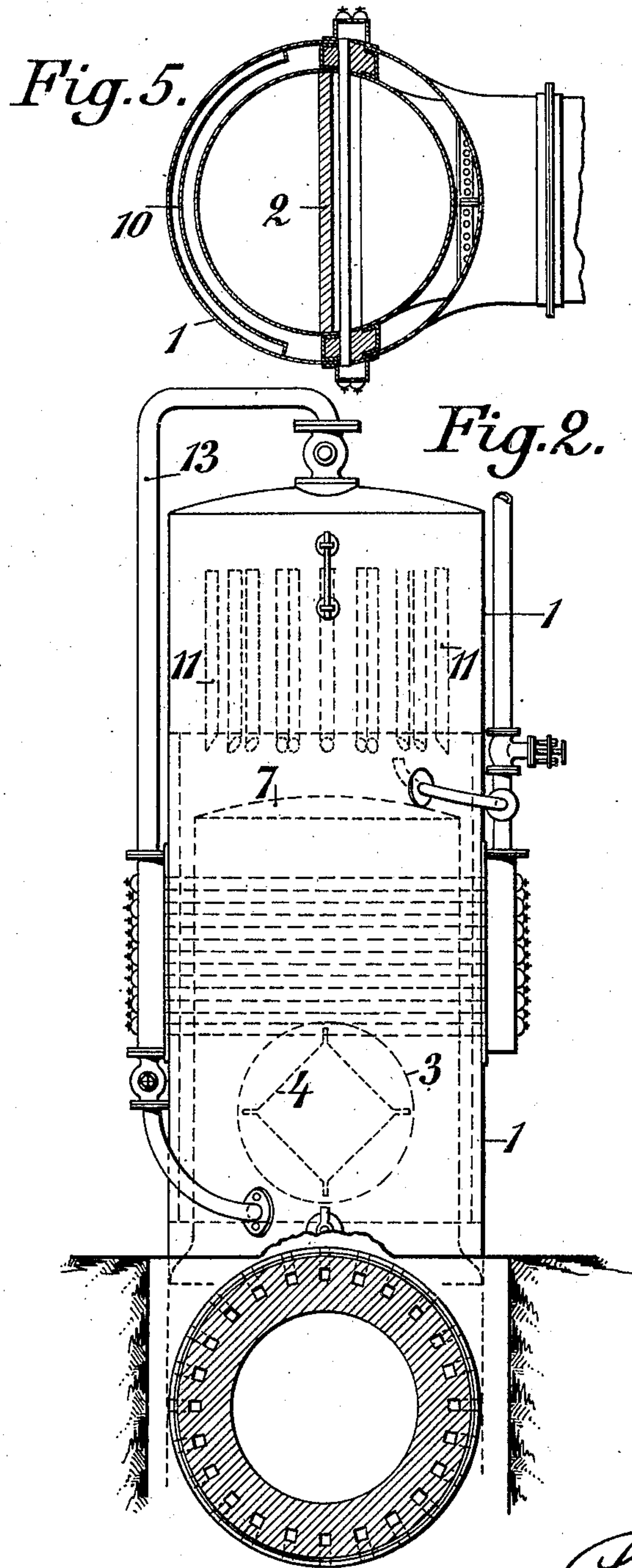
Paul Ssiway
by James J. J. J.
ATTORNEYS

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2 SHEETS—SHEET 2.



WITNESSES

H. Schneider

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UNITED STATES PATENT OFFICE.

PAUL SSIWAY, OF KOCHMA, RUSSIA.

STEAM-BOILER.

No. 835,872.

Specification of Letters Patent.

Patented Nov. 13, 1906.

Application filed July 17, 1906. Serial No. 326,536.

To all whom it may concern:

Be it known that I, PAUL SSIWAY, engineer, a subject of the Russian Emperor, residing at Kochma, Russia, have invented a certain new and useful Improved Construction of Upright Steam-Boilers; and 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.

This invention relates to an improved construction of upright steam-boilers having a fire-box. In a known construction of such boilers a horizontal fire-tube boiler has been combined with the upright boiler, which serves as evaporator and has its own steam-space, so that by this construction the water of the boiler circulates in different paths independent of each other.

The present invention consists in arranging the horizontal boiler, having a fire-tube for the passage of the combustion-gases, so as to act only as a feed-water heater. By this means a strong circulation of the water in a single path through the entire boiler is effected.

Figure 1 of the accompanying drawings shows a vertical section of a boiler constructed according to my said invention. Fig. 2 shows a front view; and Figs. 3 to 6 are cross-sections taken, respectively, on lines A B, E F, C D, and G H of Fig. 1.

The combustion-gases pass in the direction indicated by the arrows *d*, Fig. 1, first into the interior of the fire-box of the upright boiler 1, and they then pass downward behind the transverse partition 2 into the horizontal feed-water heater, which is preferably made comparatively long and is provided with a fire-tube 4. The fire-tube is advantageously made of a square cross-section, as shown at Fig. 6, and has closely-arranged sets of transverse water-tubes 5, arranged to cross each other. The feed-water heater 3 can be made with its free end somewhat lower than the end opening into the upright boiler 1. If the feed-water heater is made of

sufficient length, the heat of the combustion-gases is very effectually utilized, as in passing through the feed-water heater they come successively in contact with parts containing water of decreasing temperature. It is therefore possible to utilize the heat of the gases to a degree below the temperature of the steam. By this means also a single circulating-path for the water is facilitated. The old water enters through the pipe 6 at the rear end of the feed-water heater 3, and in flowing forward through the water-tubes 5 it passes successively into gradually hotter zones and then rises up through the annular space of the upright boiler formed by the fire-box and unites to a boiling mass over the crown 7 of the fire-box. The single circulation of the water thus produced can be further accelerated by the use of Dubian emulsion-tubes 11 with circulating-jacket 8 10. The action of the said tubes also accelerates the circulation of the water in the horizontal feed-water heater 3, the water being made to flow rapidly through the same in the direction of the arrows *c*.

The steam is taken off through the pipe 13, below which is a shield 14 for retaining the water carried along by the steam.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

An upright boiler with fire-box wherein a horizontal feed-water heater 3 with fire-tube 4 for the discharge of the gases opens directly into the water-space of the boiler 1, the feed-water heater being made of sufficient length for effectually utilizing the heat of the combustion-gases, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

PAUL SSIWAY.

Witnesses:

JULES SCHMIEL,
FELIX PIOTROVSKY.