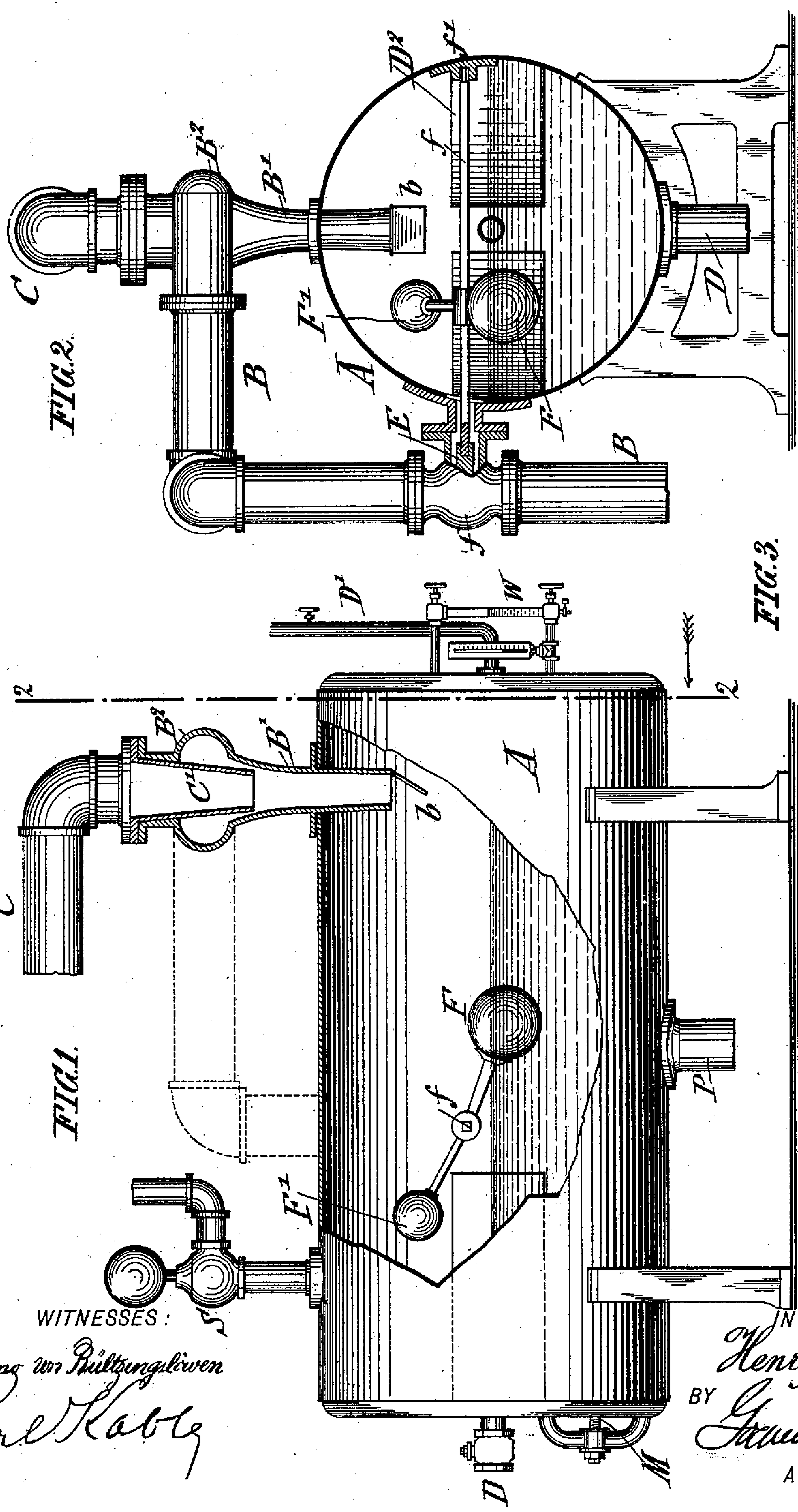
(No Model.)

H. E. PARSON.

FEED WATER HEATER.

No. 592,206. Patented Oct. 19, 1897.



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HENRY E. PARSON, OF BROOKLYN, NEW YORK.

FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 592,206, dated October 19, 1897.

Application filed March 24, 1897. Serial No. 628,951. (No model.)

To all whom it may concern:

Be it known that I, HENRY E. PARSON, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Feed-Water Heaters and Regulators, of which the following is a specification.

This invention relates to certain improvements in feed-water heaters, by which the exhaust-steam from the steam-engine, or other source, is utilized for the purpose of heating the water supplied to the boiler, and in which at the same time the normal water-level is simultaneously kept up by the automatic opening and closing of the supply-valve in the water-supply pipe; and the invention consists of a feed-water heater which comprises a tank, a feed-water-supply pipe, an injector for the feed-water, operated by the exhaust-steam from the engine, and a deflector at the inner end of the injector-nozzle.

The invention also consists of a live-steam pipe leading into one end of the tank, a blow-off cock at the other end of the tank, and deflecting-plates converging toward the blow-off cock, so that the scum and oil which are on the surface of the water can be forced out by the action of the steam from said pipe.

In the accompanying drawings, Figure 1 represents a side elevation, partly in section, with parts broken away, of a feed-water tank with my improved heater attached thereto. Fig. 2 is a vertical transverse section on line 2 2, Fig. 1; and Fig. 3 is a broken horizontal section, on a reduced scale, showing the arrangement of the deflecting-plates.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents a feed-water tank of the required size and construction, B a feed-water-supply pipe, and C the exhaust-steam pipe by which the exhaust-steam from the steam-engine, or other source, is conducted back into the tank. The feed-water-supply pipe B terminates in a nozzle B′, that extends into the tank, near one end, and is arranged at right angles to the water-supply pipe, said nozzle tapering downward from an annular enlargement B^2, into which enters a conical nozzle C′ of the exhaust-steam pipe C in such a manner that a small space is formed between the upper part of the conically-tapering nozzle B′ and the lower end of the interior nozzle C′. The nozzles B′ and C′ form together an injector for the feed-water pipe, which is caused to act by the exhaust-steam from the engine. The exhaust-steam creates a vacuum in the enlargement B^2 of the nozzle B′ of the injector and draws the water through the supply-pipe C against the counter-pressure in the tank into the latter. At the lower end of the nozzle B′, inside of the tank, is arranged an inclined deflector-plate *b*, that serves the mixture of water and exhaust-steam toward the middle part of the tank.

The tank is provided with the usual safety-valve S, water-gage W, &c., and with a bottom pipe P for drawing off the water when the boiler is to be cleaned. It is also provided with a manhole and manhole-cover M for cleaning the lower part of the tank from sediment.

On a level with the normal water-level is arranged on one head of the boiler a blow-off cock D for permitting the discharging from time to time of the scum or oil, carried along by the exhaust-steam from the engine, from the surface of the water in the tank, so that the same is not carried back with the water to the boiler. The discharge is caused by live steam, which is let in through the pipe D′ at the moment desired, at which time the cock is opened, so that the oil and scum can be deflected through the cock by the deflecting-plates D^2. These plates are arranged in the boiler so as to converge toward the cock. In the tank is arranged a solid float F, the shank of which is pivoted to a transverse rock-shaft *f*, that turns in suitable bearings *f′* at the interior of the tank and the water-supply pipe B. The float F is made solid, so as to prevent the bursting to which hollow balls are liable when exposed to great differences of temperature. The float is balanced by a small weight F′, which is applied to an arm attached to the transverse rock-shaft *f*, so that the float F freely follows the rising and lowering of the water-level in the tank. The transverse rock-shaft *f* passes through the side wall of the tank, and is provided at its outer end with an axially-turning valve E in the feed-water-supply pipe B, so that no

water can pass from the tank to the feed-water-supply pipe. By the rise and fall of the water-level the float F is likewise raised or lowered and thereby the valve in the supply-pipe closed or opened more or less and the water in pipe C subjected to the suction action of the exhaust-steam that is forced into the tank through the injector B′ C′. This intermittent supply of feed-water to the tank keeps the water in the tank at a uniform level, while the feed-water is heated by the heat of the exhaust-steam.

The advantages of my improved feed-water heater are that the exhaust-steam can be condensed and utilized for ejecting the feed-water into the tank, and that the supply is automatically controlled by the rising and falling of the float in the tank, so as to control the feed-water-supply pipe and to thereby keep up the water-level.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a feed-water heater for steam-boilers, the combination of a feed-water tank, a feed-water-supply pipe, an injector for the latter operated by the exhaust-steam from the engine, and a deflector arranged at and inclined relatively to the lower end of the injector, whereby the mixture of water and exhaust-steam is delivered toward the middle of the boiler, substantially as set forth.

2. In a feed-water heater, the combination of a tank, a steam-pipe leading into one end of the tank on a level with the normal water-level, a blow-off cock, located at the other end of the tank, on said level, and deflecting-plates arranged in the tank and converging toward the said cock, substantially as set forth.

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

H. E. PARSON.

Witnesses:
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