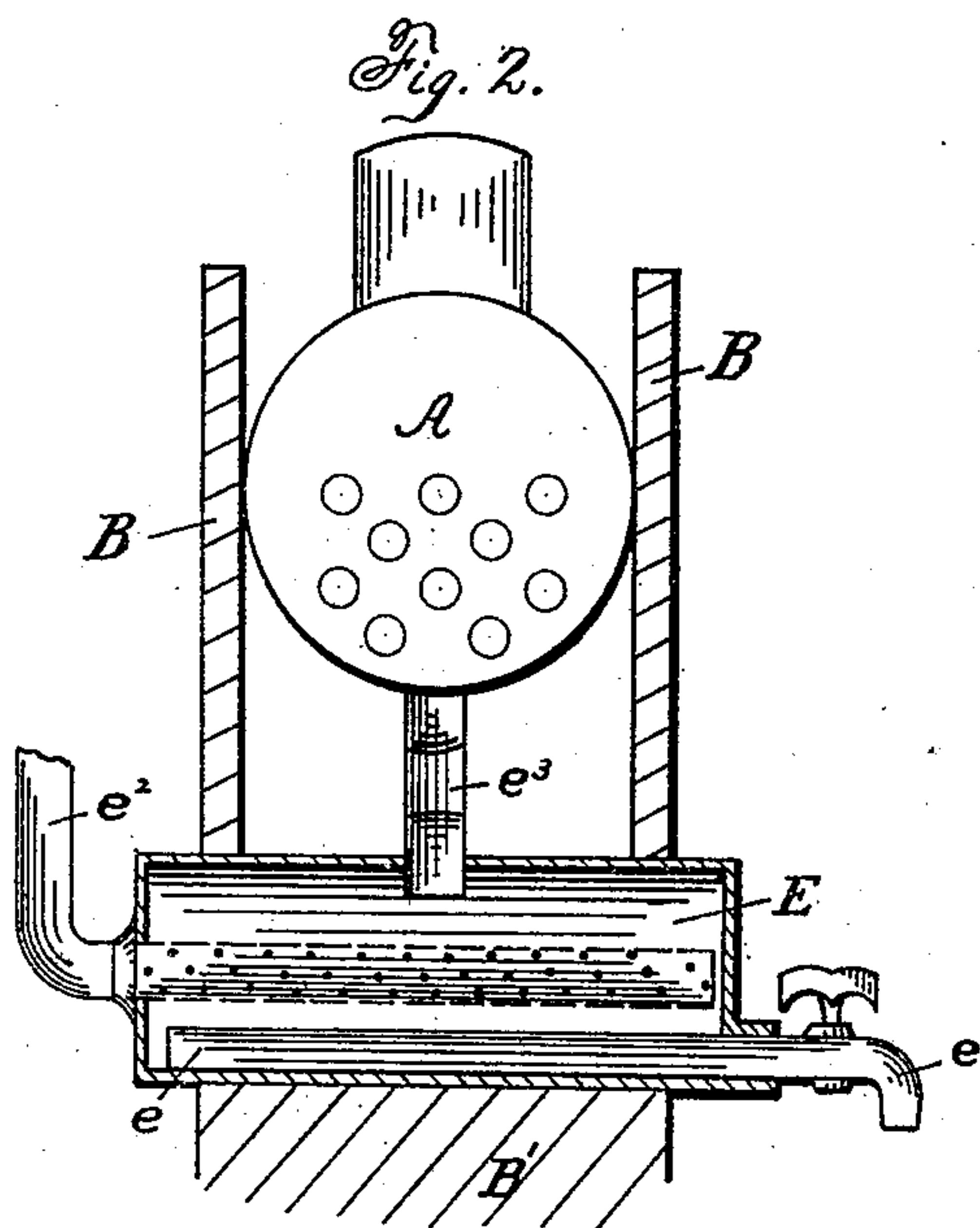
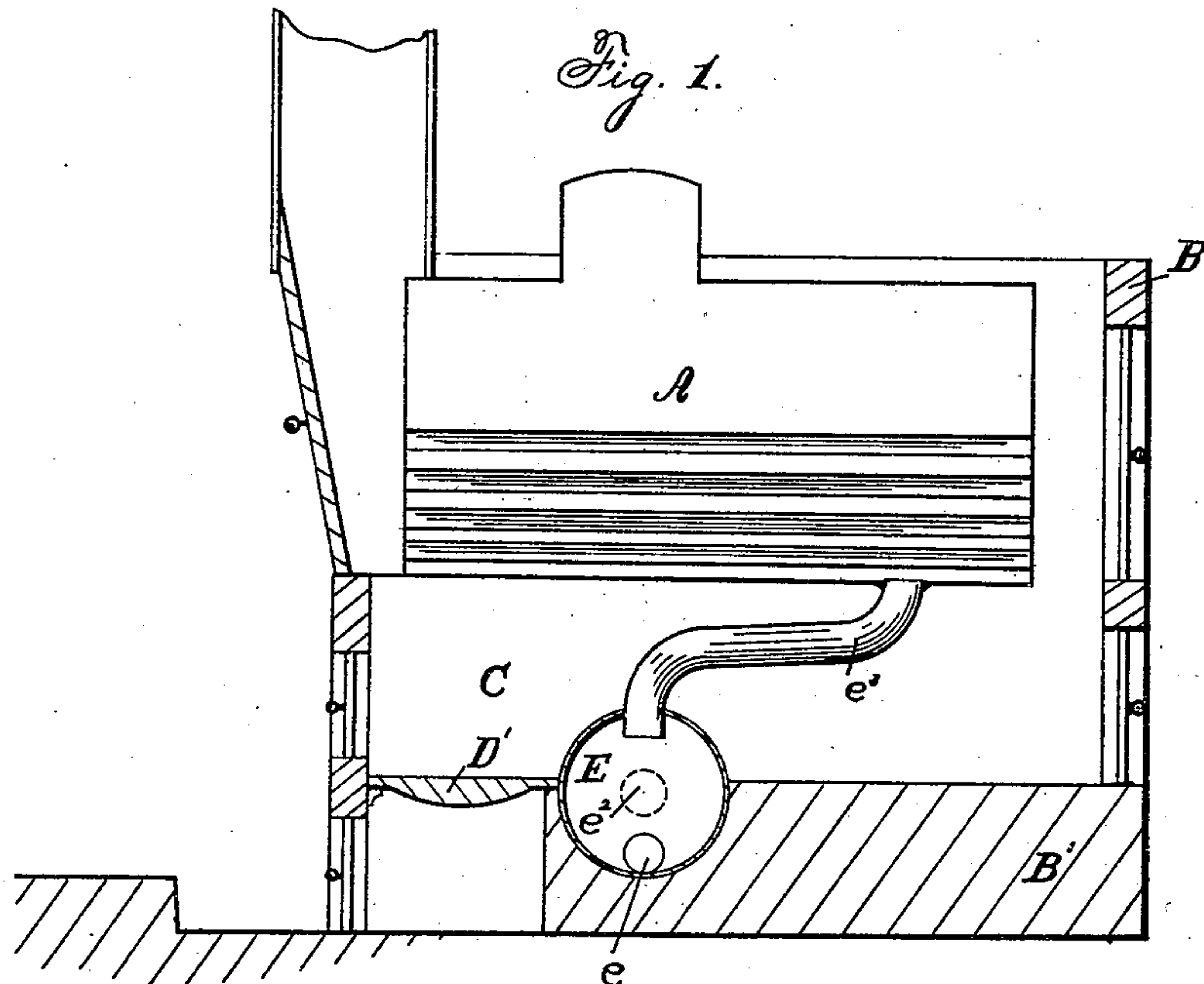


(No Model.)

R. W. PELTON.
FEED WATER HEATER.

No. 270,692

Patented Jan. 16, 1883.



WITNESSES

Samuel C. Thomas.
J. Edward Warren

INVENTOR

Richard W. Pelton
By W. W. Fegget

Attorney

UNITED STATES PATENT OFFICE.

RICHARD W. PELTON, OF TOWNSEND, SANDUSKY COUNTY, ASSIGNOR OF ONE-HALF TO M. F. COWDERY AND O. P. COWDERY, OF SANDUSKY, OHIO.

FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 270,692, dated January 16, 1883.

Application filed May 19, 1882. (No model.)

To all whom it may concern:

Be it known that I, RICHARD W. PELTON, of Townsend, county of Sandusky, State of Ohio, have invented a new and useful Improvement in Feed-Water Heaters for Steam-Boilers; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form a part of this specification.

My invention consists in the combinations of devices and appliances hereinafter specified, and more particularly pointed out in the claims.

In the drawings, Figure 1 is a longitudinal central section of a device embodying my invention. Fig. 2 is a vertical cross-section of the same.

Heretofore great difficulty has been experienced in the use of steam-boilers from the presence of various impurities—such as mud, lime, &c.—in the water used, whereby a coating or deposit is formed in the boiler, causing much trouble and expense in the removal of the same, and constituting the most fruitful source of boiler explosions by reason of the burning out of the coated surfaces, and also causing a great waste of fuel. It is the object of my invention to correct this difficulty.

It is well known that water when heated tends to precipitate its many impurities. My invention provides means for accomplishing this result and for furnishing to the boiler water in a heated and purified condition.

Heretofore it has been customary generally to heat the feed-water from below or from a heating-surface in the body of the water. In these cases, however, ebullition so agitates the water that the impurities which are separated are not permitted to settle or precipitate, but are fed onward with the water into the boiler. By my invention, however, the water is heated from the top, so that this agitation is prevented, and impurities are therefore permitted to settle quietly as soon as separated. My construction is such as to facilitate this settling, also to facilitate the removal of deposits from the heater, and the introduction of water to the heater in the most practicable manner to effect the separation of its impurities by the heat.

To this end, as shown in the drawings, A is a boiler of any ordinary construction.

B is its wall or case.

B' is the foundation.

C is the furnace.

D' is the grate.

E is a feed-water reservoir, located under the boiler and within the furnace in such a manner that the water shall be heated on the top or upper portion. I prefer that the lower portion of this feed-water reservoir should be excluded from the direct heat of the furnace by embedding the said lower portion either in common earth masonry or some non-conducting material, so as to secure as low a temperature as possible in the bottom of the reservoir, and thus facilitate the clarifying of the water by preventing ebullition.

e is a removable tube or mud-pipe in the feed-water reservoir. I prefer that this tube should be nearly as long as the reservoir. On the outside end it is provided with a faucet, e', for the purpose of drawing off any sediment that may accumulate in the bottom of the reservoir. This pipe may be drawn out, so as to draw away the sediment from any point along its line.

e² is the supply-pipe by which water is admitted to the reservoir. I prefer that said tube should be suitably perforated, so as to emit the water into the reservoir in the form of jets from the numerous perforations along its whole length.

e³ is the feed-tube leading from the reservoir into the boiler. A curved tube is found very convenient in connecting the reservoir with old boilers; but I do not limit myself to the curved form of the tube, as a straight one comes also within the scope of my invention. In practice it is found preferable that this tube should extend a little below the surface of the water in the reservoir.

I am aware that feed-water heaters have been located on a bridge-wall underneath the boiler, adapted for a steam generator and circulator for steam-boilers, where the construction is evidently not designed, however, to purify the water, as above described, but to expose as much of the surface of the reservoir as possible to the heat to generate steam and to introduce it back into the boiler; and for

this purpose the device is provided with means for supplying the reservoir with water from the boiler, the water being first pumped into the boiler. In said device, also, means are
 5 provided for returning the steam to the boiler. I do not claim such a construction, as it is the essential feature of my invention not to locate the reservoir "across the top of the bridge-wall," as in the device referred to, where "the bridge-
 10 wall terminates nearly on a level with the grate-bars," being surmounted by the reservoir, but to suitably exclude the lower portion of the reservoir from the heat by embedding said portion in some non-conducting material, so as
 15 to prevent the heating of the water in the bottom of the reservoir as much as possible, for the purpose of facilitating the deposit of any impurities in the water.

My construction is purposely designed to
 20 prevent circulation from the bottom of the boiler into and through the reservoir, but is specially for the purpose of supplying the boiler with water heated at the upper surface in the heating-reservoir.

25 It will also be observed that the feed-water heater is itself the mud-pipe of the boiler, being so located as to gather the sediment that may pass into the latter.

What I claim is—

30 1. A feed-water heater for supplying purified water to steam-boilers, consisting of a reservoir located within the furnace in such a manner that the lower portion shall be excluded from the direct furnace heat, and adapted
 35 to receive the furnace heat only upon its upper portion, and in combination therewith a pipe adapted to feed water from the upper surface of said reservoir to the boiler and a pipe adapted to supply water to said reservoir,
 40 substantially as described.

2. A feed-water heater for supplying purified water to steam-boilers, consisting of a reservoir located within the furnace in such a

manner that the lower portion shall be excluded from the direct furnace heat, and adapted
 45 to receive the furnace heat only upon its upper portion, and in combination therewith a pipe adapted to feed water from the upper surface of said reservoir to the boiler, and a pipe adapted to supply water to the top of
 50 said reservoir, and provided with an interior perforated end, substantially as described.

3. A feed-water heater for supplying purified water to steam-boilers, consisting of a reservoir located within the furnace in such a
 55 manner that the lower portion shall be excluded from the direct furnace heat, and adapted to receive the furnace heat only upon its upper portion, and in combination therewith a pipe adapted to feed water from the upper
 60 surface of said reservoir to the boiler, a pipe adapted to supply water to said reservoir, and an interior adjustable tube, *e*, located in the bottom of said reservoir and provided with a faucet at its outer end, substantially as and
 65 for the purposes described.

4. The combination, with a steam-boiler, of a feed-water heater for supplying the boiler with purified water, said heater consisting of a reservoir located within the furnace in such
 70 a manner that the lower portion shall be excluded from the direct furnace heat, and adapted to receive the furnace heat only upon its upper portion, and in combination therewith a pipe adapted to feed water from the upper
 75 surface of said reservoir to the boiler, and a pipe adapted to supply water to the top of said reservoir, and means for cleansing the reservoir of sediment, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses. 80

RICHARD W. PELTON.

Witnesses:

ARTHUR PHINNEY,
 M. F. COWDERY.