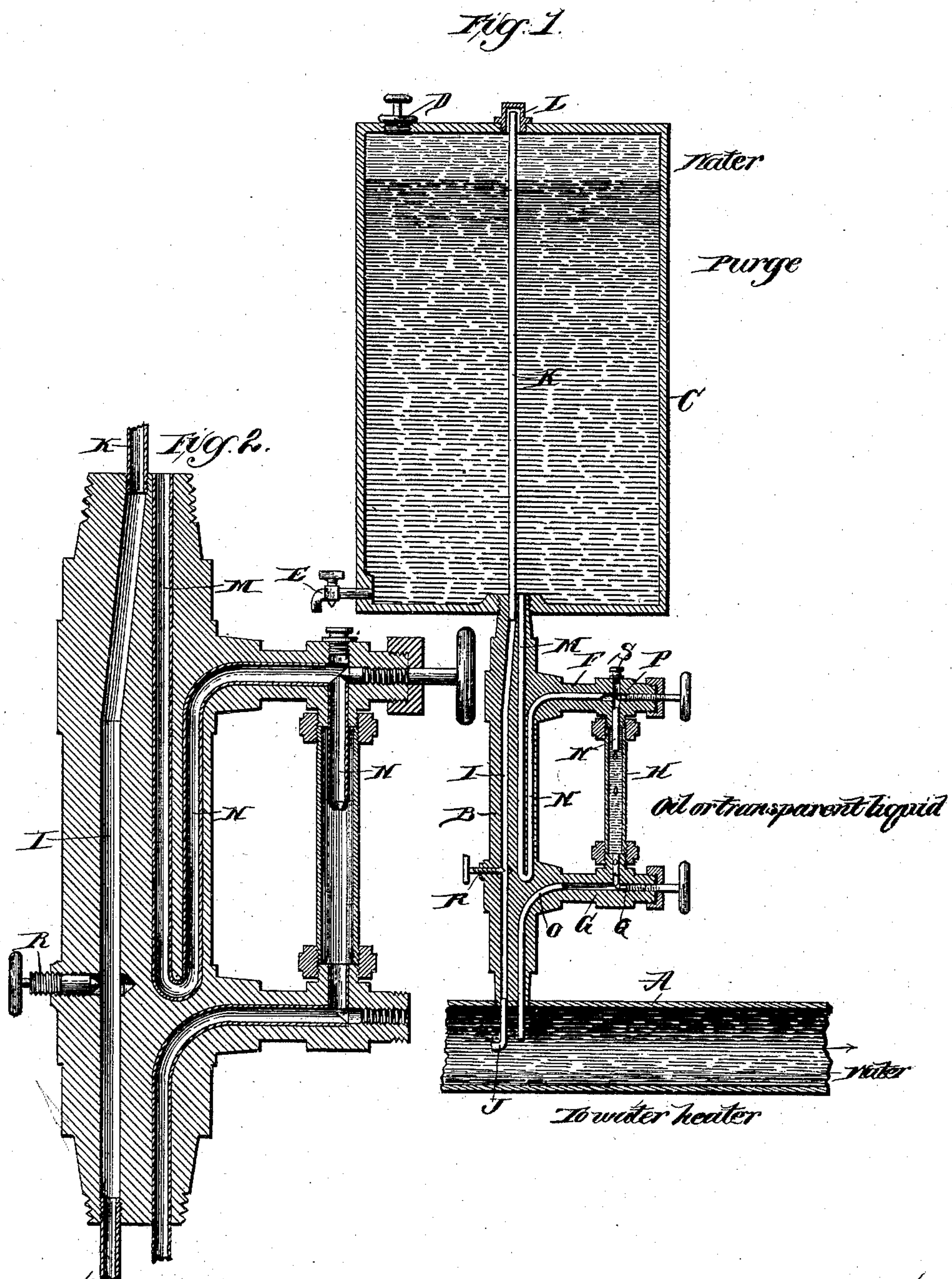


(No Model.)

N. E. SHONTZ.
BOILER PURGE FEEDER.

No. 445,909.

Patented Feb. 3, 1891.



Witnesses—
Wm. H. Fort
R. B. Quahundro

Inventor
Neri E. Shontz
by *Elliott H. Quahundro*
Attys

UNITED STATES PATENT OFFICE.

NERI E. SHONTZ, OF CHICAGO, ILLINOIS.

BOILER-PURGE FEEDER.

SPECIFICATION forming part of Letters Patent No. 445,909, dated February 3, 1891.

Application filed January 14, 1890. Serial No. 336,941. (No model.)

To all whom it may concern:

Be it known that I, NERI E. SHONTZ, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Boiler-Purge Feeders, of which the following is a specification.

This invention relates to improvements in that class of devices known as "boiler-purge feeders" for feeding or introducing a purge into the feed-water before it reaches the boiler, in order that when heated the purge may cause the precipitation of all scale-forming and other impurities from the water.

The prime object of this invention is to have the feeder automatic and uniform in its operation, but readily controllable and of such a character that the gravity of the purge may be utilized for forcing the feed.

Another object is to utilize the feed-water as a balance for a sight-feed liquid, through which the purge passes and the feed thereof observed, and also to prevent the occurrence of a vacuum in the purge-reservoir, whereby the gravity-feed of the purge will remain unaffected during the discharge of the entire contents of the reservoir.

Other objects are to provide novel details of construction for promoting the durability, simplicity, and effectiveness of my invention.

These objects are obtained by the devices illustrated in the accompanying drawings, in which—

Figure 1 represents a central vertical section through a purge-feeder embodying my invention, and Fig. 2 an enlarged detail section through the feed-tube.

Similar letters of reference indicate the same parts in both the figures of the drawings.

Referring by letter to the accompanying drawings, A indicates a feed-water pipe, preferably that portion leading from the pump to the feed-water heater, because in the practical use of my boiler-purge feeder it is preferable that the purge should be introduced into or mixed with the feed-water while cool and be gradually heated with the water while in the heater, for under these conditions the very best results are obtainable, and the precipitation of the lime, scale-forming sub-

stances, and other impurities contained in the water will be separated from the water while in the heater and precipitated into the usual receptacle provided for that purpose, although if no feed-water heater be employed the same results would be accomplished when the water entered the boiler, for the impurities would be precipitated into the mud-drum thereof. To this pipe A is screwed or otherwise rigidly secured the feed-pipe B, standing upright and having secured to the upper end thereof the reservoir C, supplied with a removable plug D for convenience in filling and a blow-off cock E to discharge the sediment therefrom.

The feed-tube is provided with two lateral branches F G near the upper and lower ends thereof, respectively, which are in turn connected by a brass tube H, extending parallel with the body of the feed-tube. Through the feed-tube from end to end and preferably to one side of the center extends a passage or bore I, to the lower end of which connects, preferably, an angular pipe J, extending into the feed-water pipe, while with the upper end of the passage connects a pipe K, extending up through the reservoir C and terminating within a hollow plug L, fitted into the upper end of the reservoir, the hollow or recess of the plug or cap being of sufficiently greater dimension than the pipe to permit the free passage of water from the pipe down into the reservoir. Through the feed-tube extends another passage M, but in an irregular or tortuous manner, beginning at the upper end of the tube and extending about two-thirds of the way down the length of the tube, then bending backward with a portion N parallel with the main portion, which extends upwardly, and then out through the upper branch F of the feed-tube, terminating in the glass tube. From the lower end of the glass tube H leads the remainder of the passage through a pipe O, extending through the branch G and the lower portion of the body of the feed-tube down into the feed-water pipe A a suitable distance.

In each of the branches F G are arranged hand-operated valves P Q, by means of which the passage last described, and which we will call the "purge-passage," may be closed both from the reservoir and from the feed-water

pipe. The water-passage I through the tube is also provided with a hand-operated valve R for closing this passage, and the branch F is further provided with a screw-plug S for convenience in filling the glass tube with kerosene-oil or a similar light-colored oil or liquid of any kind that will float upon water, so that it may be sustained and confined within the glass tube by the pressure of the water from the feed-water pipe when the valve Q is open and the purge-feeder in operation.

In practice, after this glass tube is filled with a suitable liquid the reservoir is filled with a purge of some suitable character and generally of a dark color, which by reason of its gravity flows down through and fills the purge-passage M N to the valve P in the upper branch of the feed-tube. After this the valves P, Q, and R are opened and the purge by gravity alone will pass in drops through the liquid in the glass tube, where its feed may be observed, down through the remainder of the purge-passage O into the feed-water tube A, where it will mix with the feed-water and be carried thereby to the heater, there to do its work of purging the water of impurities, as before described.

It will be observed that as rapidly as the purge is fed from the reservoir its place is supplied by the water passing into the upper portion thereof through the water-passage, the pressure of which is equalized by the pressure of the water upon the discharge end of the purge-tube, thus leaving the purge dependent solely upon its gravity for the feed and producing a uniform and easily-controllable action of the feeder; and it will also be readily understood that the purge must have greater specific gravity than water, in order that it may not float upon the water in the reservoir, and may also rise and pass through the purge-passage and force its way down into the feed-water tube against the pressure of the water therein.

A constructional feature of importance is the purge-passage, which by reason of the character of the purge should be as smooth and free from angles and projections as possible, to which end I provide a metallic tube, which is clearly illustrated in Fig. 2, bent to the desired form of the passage, one for the upper and another for the lower section of the passage, and then cast the body of the feed-tube about these pipes, so that they will be encompassed by the tube. This construction

avoids the objectionable angles, spurs, and expense of boring this tortuous passage, besides promoting the efficiency of the feeder; but obviously such construction is not absolutely essential to the operation of the feeder, but its use is preferred because of the advantages derived therefrom, before referred to, and I therefore do not desire to limit myself to the exact structural relation or arrangement of the parts herein shown and described, nor to the exact form and relative arrangement of the passages for the water and purge in the feed-tube, so long as I am enabled to feed the purge by gravity against the pressure of the water in the feed-water pipe.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a boiler-purge feeder, the combination, with the feed-water pipe, of a feed-tube secured thereto, a purge-reservoir attached to said tube, a valved purge-passage in said tube, connecting the lower end of the reservoir and the feed-water pipe, and a sight-tube provided with a transparent liquid filling located between the valves in said passage and constituting a portion of the passage, substantially as described.

2. In a boiler-purge feeder, the combination, with the feed-water pipe, a feed-tube secured thereto, and a purge-reservoir attached to said tube, of a purge-passage opening at its ends, respectively, in said pipe and in the reservoir near the bottom thereof, and a water-passage opening at its ends, respectively, in said pipe and in the reservoir at the top thereof above the purge-line, substantially as described.

3. In a boiler-purge feeder, the combination, with the feed-water pipe, the feed-tube connected therewith, and the reservoir secured thereto, of a purge-passage opening at its ends, respectively, in said pipe and in the reservoir near the bottom thereof, a sight-tube provided with a transparent liquid filling constituting a portion of said passage, and a water-passage opening at its ends, respectively, in the feed-pipe and in the reservoir at the top thereof above the purge-line, substantially as described.

NERI E. SHONTZ.

Witnesses:

R. C. OMOHUNDRO,
W. R. OMOHUNDRO.