S. D. GILSON.

PURIFYING WATER IN STEAM-BOILERS.

No. 194,084. Patented Aug. 14, 1877.

Fig. 1.

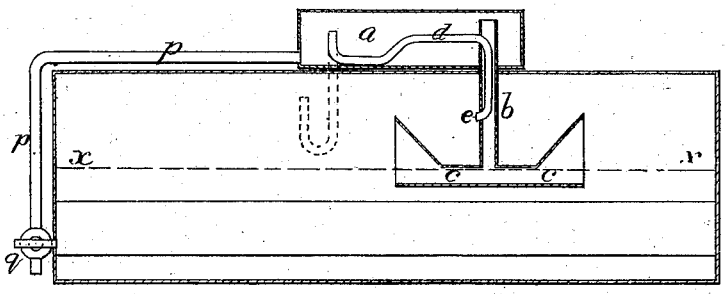
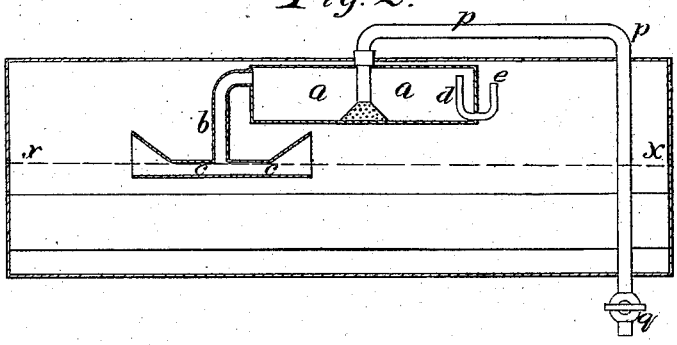


Fig. 2.



Witnesses

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SAMUEL D. GILSON, OF SYRACUSE, NEW YORK.

IMPROVEMENT IN PURIFYING WATER IN STEAM-BOILERS.

Specification forming part of Letters Patent No. **194,084**, dated August 14, 1877; application filed April 14, 1877.

To all whom it may concern:

Be it known that I, SAMUEL D. GILSON, of Syracuse, New York, have invented certain Improvements in Apparatus for Removing Impurities from the Water in Boilers, of which the following is a specification:

For some years I have removed from the water in steam-boilers the impurities held in suspension or brought to the surface, as scum, by means of a pipe at or near the surface, which served as a receptacle therefor, and into which said impurities flowed and were afterward blown off through a proper stop-cock. These impurities are much lighter than unevaporated water, of which fact I have availed myself in the construction of my precipitator, by which construction the lighter impurities, together with saturated steam, pass up into the precipitator, and the surplus water drawn up therewith is returned to the boiler through the trap-pipe.

My present apparatus is an improvement upon the simple blow-pipe before named as a mud-receptacle, and is constructed as follows—referring to the accompanying drawing, in which—

Figure 1 is a vertical sectional elevation of the boiler with a precipitator above it. Fig. 2 is a modification of the precipitator placed inside the boiler.

My precipitator *a* is, in Fig. 1, placed above the boiler, from which a pipe, *b*, opens a channel down nearly to the water-line *x x* in the boiler. This pipe *b* has a cross-pipe, *c*, at its lower end, with an open flaring mouth at each end, as seen in Fig. 1, partly submerged below the water-line. The top of the pipe *b* is above the center of the precipitator *a*. There is a smaller pipe, *d*, also within the precipitator, having its open inner end a little below that of pipe *b*, and located at the opposite end of the precipitator. This pipe *d* has a downward curvature, to form a trap, as clearly seen in the drawing, and it then enters the pipe *b*, through which it extends down below the top of the boiler and opens through pipe *b* into the steam-chamber at *e*, above the water-line of the boiler.

A blow-off pipe, *p*, is attached to the precipitator, opening into it. At or near the bottom it is furnished with a stop-cock, *q*, to open and blow off the impurities settled in the precipitator that have flowed into it from the boiler, while the water in the trap-pipe *d* prevents the steam from entering through it into the precipitator, and the water in the precipitator, when it rises above the inner end of pipe *d*, will flow back through it into the boiler.

It is obvious that instead of forming and placing pipe *d* as in Fig. 1, it may be made as shown by the dotted lines, same figure. This trap-pipe *d*, however located, cuts off the steam-chamber from the precipitator, and at the same time allows the overflow of water therefrom after the sediment is deposited in the precipator brought up by pipe *b*.

A modification of this device is shown in Fig. 2, in which the precipitator *a* is located inside the steam-chamber of the boiler. In this case the steam-pipe *b* opens into the precipitator at its end, and pipe *d* is made of U form, and inserted at the opposite end, with its end *e* outside the precipitator in the steam-chamber lower than its inner end. The blow-pipe *p* in this figures enters through the top of the boiler and precipitator, terminating in an expansion at the bottom of the precipitator, where it is perforated and receives and draws off the scum, &c., through the blow-off pipe *p*, and thus frees the precipitator from time to time as it fills.

The action of this apparatus is first to collect in pipe *b* the light scum-froth, which, with the saturated steam, rises into the precipitator, where the steam condenses and the impurities settle. As the precipitator fills above pipe *d* the water passes off into the boiler, leaving the impurities below, which, as before stated, are blown off by the pipe *p* at intervals as they accumulate.

Having thus fully described my invention, I claim—

1. The combination of the inlet-pipe *b* and trap-pipe *d* with the precipitator, in the manner and for the purposes described.

2. The combination of the blow-off pipe *p* with the precipitator *a*, inlet-pipe *b*, and trap-pipe *d*, as herein specified.

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