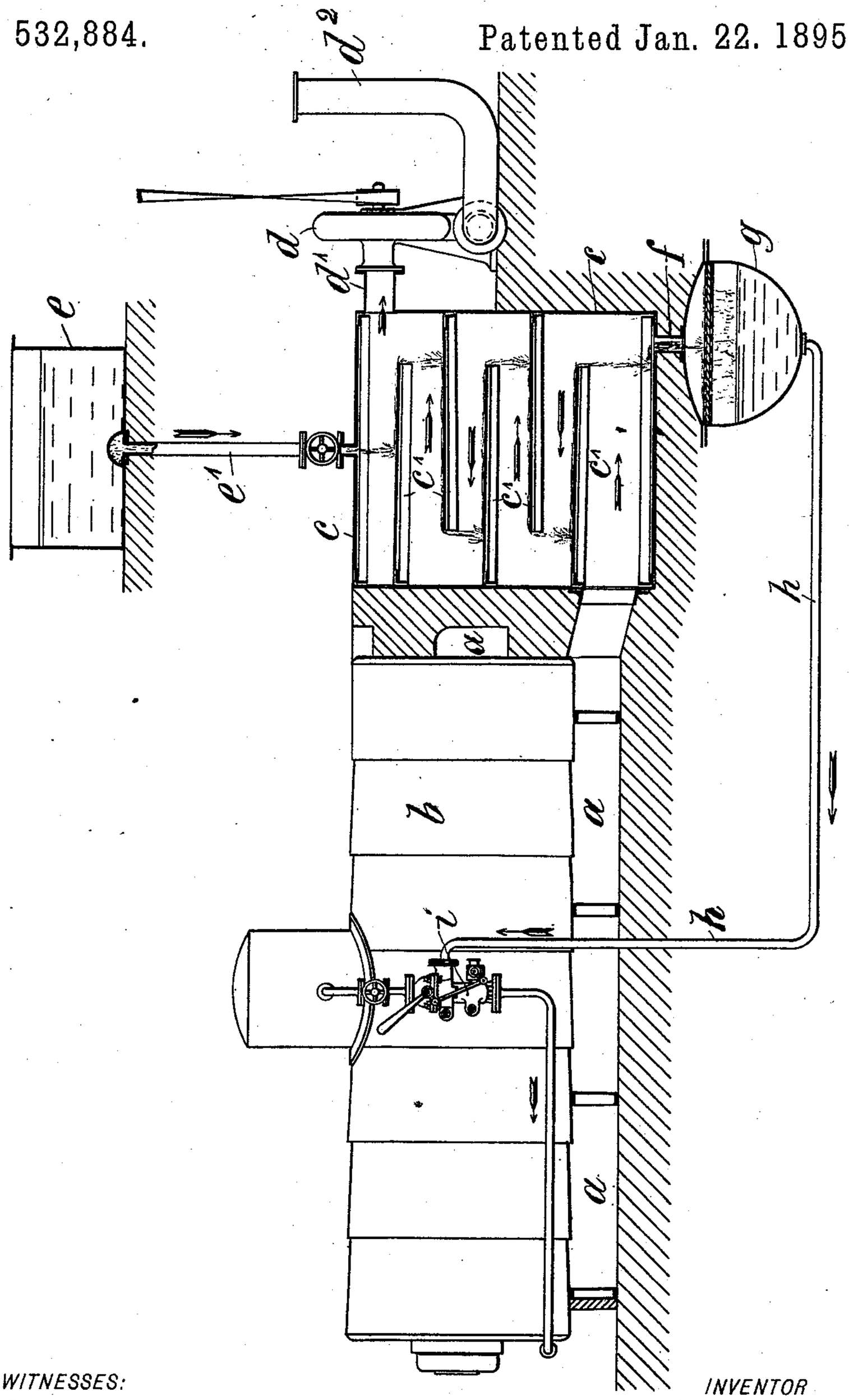
(No Model.)

H. LEFFLER.

APPARATUS FOR UTILIZING HEAT OF GASES OF COMBUSTION.

No. 532,884. Patented Jan. 22. 1895.



WITNESSES:

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UNITED STATES PATENT OFFICE.

HANS LEFFLER, OF GIEBICHENSTEIN, GERMANY.

APPARATUS FOR UTILIZING HEAT OF GASES OF COMBUSTION.

SPECIFICATION forming part of Letters Patent No. 532,884, dated January 22, 1895.

Application filed March 16, 1894. Serial No. 503,836. (No model.)

To all whom it may concern:

Be it known that I, HANS LEFFLER, a subject of the King of Prussia, German Emperor, residing at Giebichenstein, near Halle-on-the Saale, Kingdom of Prussia, Germany, have invented a certain new and useful Improvement in Apparatus for Utilizing the Heat of the Gases of Combustion, of which the following is a specification.

This invention relates to an improved apparatus for utilizing the heat absorbed by the gases of combustion in boilers and other heat generators.

By my invention the gases of combustion will not be caused to pass through the purifying liquid by means of a pressure, but by means of a vacuum. The purifying liquid is subsequently freed from the pulverous materials by a filter, so that it may be used as feed water for the steam boiler.

The accompanying drawing represents an elevation, partly in section, of my improved apparatus.

The gases of combustion which escape from the flues *a*, of a steam boiler *b*, enter the lower part of a closed receptacle or receiver *c*. Within this receiver is contained a series of horizontal baffle-plates *c'*, arranged to break line, so that the gases are caused to move in a zig-zag course. The gases of combustion are drawn upward by means of a ventilator *d'*, the suction pipe *d'*, of which enters the upper end of the receiver.

Above the receiver *c*, is placed a tank *e*, from which water flows through pipe *e'*, into the receiver and over the horizontal baffle-plates *c'*. In this way cascades are formed which intercept the gases of combustion in their zig-zag course. The cascades cause the gases to be freed from their pulverous ingredients and in this way, the gases discharged from exhaust pipe d^2, are entirely colorless. The water heated to a certain extent and charged with the pulverous materials passes through tube *f* into a filter *g*. From the latter, the pure but hot water flows through a pipe *h*, to the feed apparatus *i*, of the steam boiler *b*.

It will be seen that by my invention the pulverous materials admixed with the gases of combustion are removed from these gases before the latter pass to the ventilator. Furthermore this passage is effected after the gases have been cooled, and thus it will be possible to make use of a proportionately small ventilator, while its wear and tear is diminished, as the excessive heating by means of the gases of combustion is obviated.

What I claim is—

The combination of a boiler with a receiver, a series of baffle-plates arranged above one another so as to break line, an inlet pipe for the products of combustion connecting the boiler flue with the receiver, a suction pipe, an upper water inlet pipe, a filter and a pipe connecting the filter with the boiler feed, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HANS LEFFLER.

Witnesses:

CARL HOELZER,

FRIEDRICH REICH.