(No Model.)

J. GREGORY.

STEAM BOILER ATTACHMENT.

No. 462,314. Patented Nov. 3, 1891.

Fig. 1.

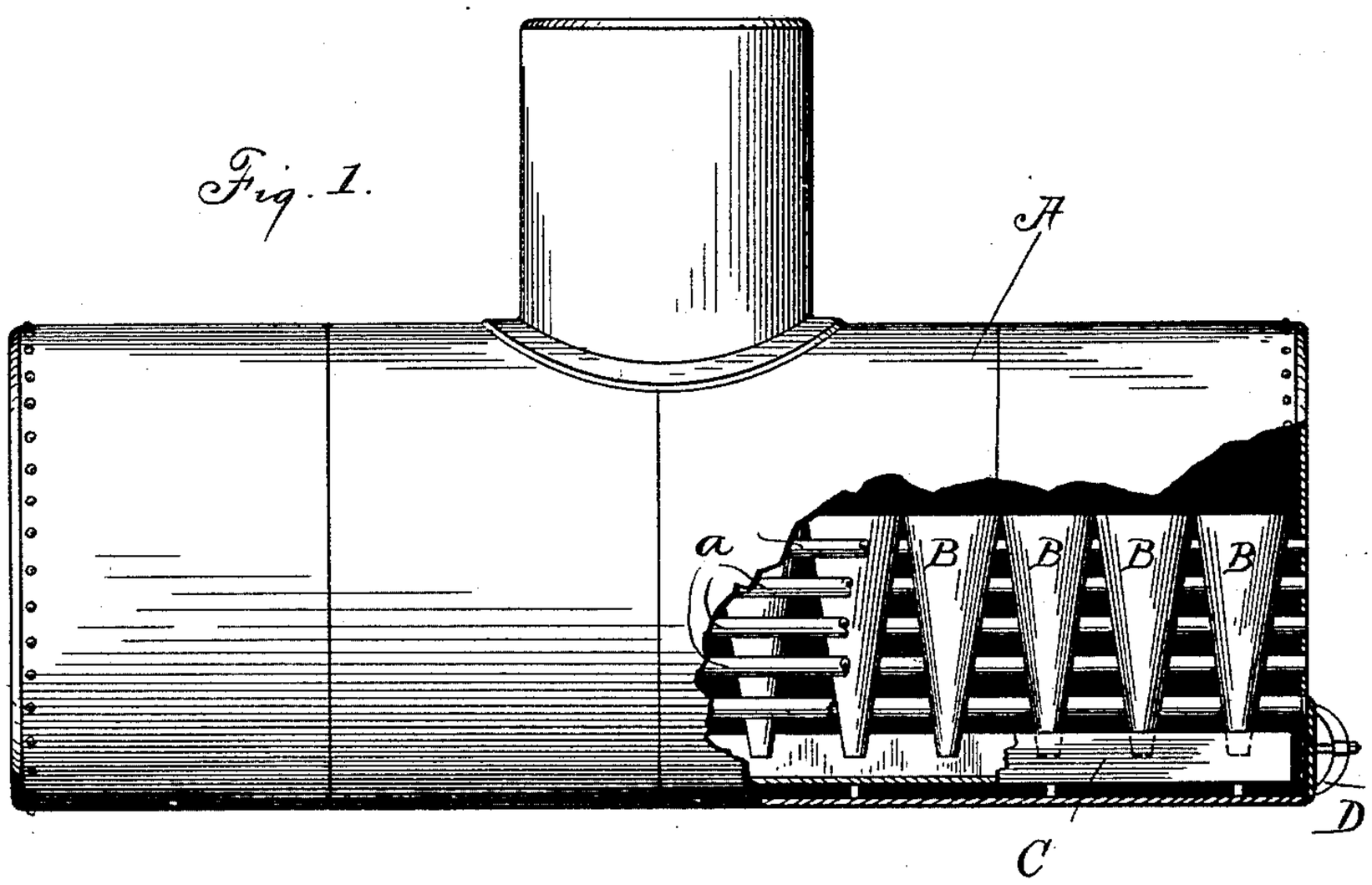
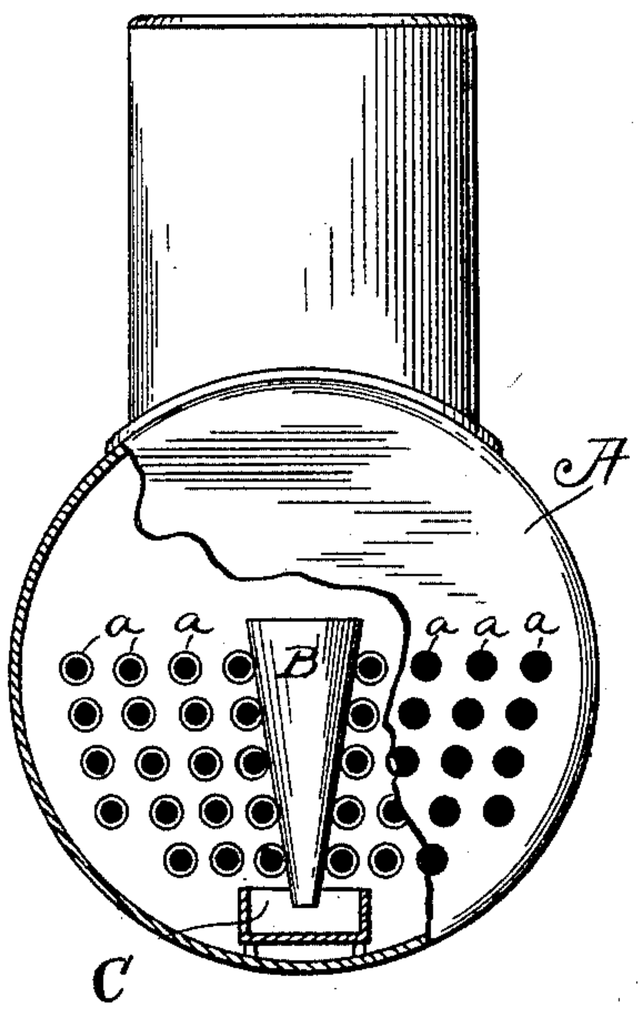


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN GREGORY, OF MARION, OHIO.

STEAM-BOILER ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 462,314, dated November 3, 1891.

Application filed July 25, 1891. Serial No. 400,735. (No model.)

To all whom it may concern:

Be it known that I, JOHN GREGORY, of Marion, in the county of Marion and State of Ohio, have invented certain new and useful Improvements in Steam-Boiler Attachments; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in steam-boiler attachments, comprising in the main a series of circulating-tubes and a removable trough or container for catching the sediment.

In the accompanying drawings, Figure 1 is a side elevation, part in section, and Fig. 2 is an end elevation, part in section, of a steam-boiler and attachments embodying my invention.

A represents the shell of a horizontal tubular boiler, and *a a a* represent the tubes thereof. The rows of tubes nearest the transverse center of the boiler are located substantially as shown in Fig. 2 to make room for the series of upright conical circulating-tubes B, these being placed in close proximity to each other, as shown more clearly in Fig. 1. Tubes B discharge at the bottom into a trough or container C for catching the sediment. There is a large-sized hand-hole at D, through which the trough or container can easily be removed. The trough, by means of legs or other suitable device, should be located a short distance above the internal bottom of the boiler to give free circulation underneath the trough. The water underneath the trough as it becomes heated necessarily passes laterally and then up between the tubes and along the sides of the boiler and returns downward through tubes B, thus establishing a perfect circulation throughout the boiler, and as the water passes downward through these vertical tubes the sediment is precipitated and discharges into trough C, and from time to time this trough is removed, cleaned, and returned to the boiler. By such means the boiler can easily be kept clean and its steam-generating capacity thereby greatly increased, and this, too, without any liability of injuring the boiler, as is frequently done by the use of chemicals in the boiler.

The danger to the boiler and the great waste of fuel caused by sediment in the boiler are too well known to require further mention.

What I claim is—

1. In a steam-boiler, a series of upright circulating-tubes and a removable trough located inside the boiler in position to receive the downward discharge of such circulating-tubes, substantially as set forth.

2. In a steam-boiler of the horizontal tubular variety, a series of conical upright circulating-tubes arranged substantially as shown and a removable trough or container located inside the boiler underneath such upright tube, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 12th day of June, 1891.

JOHN GREGORY.

Witnesses:

CHARLES C. FISHER,

ROBERT HOPKINS.