H. S. COLEMAN.

CIRCULATING DEVICE FOR STEAM BOILERS.

No. 190,743. Patented May 15, 1877.

Fig. 1.

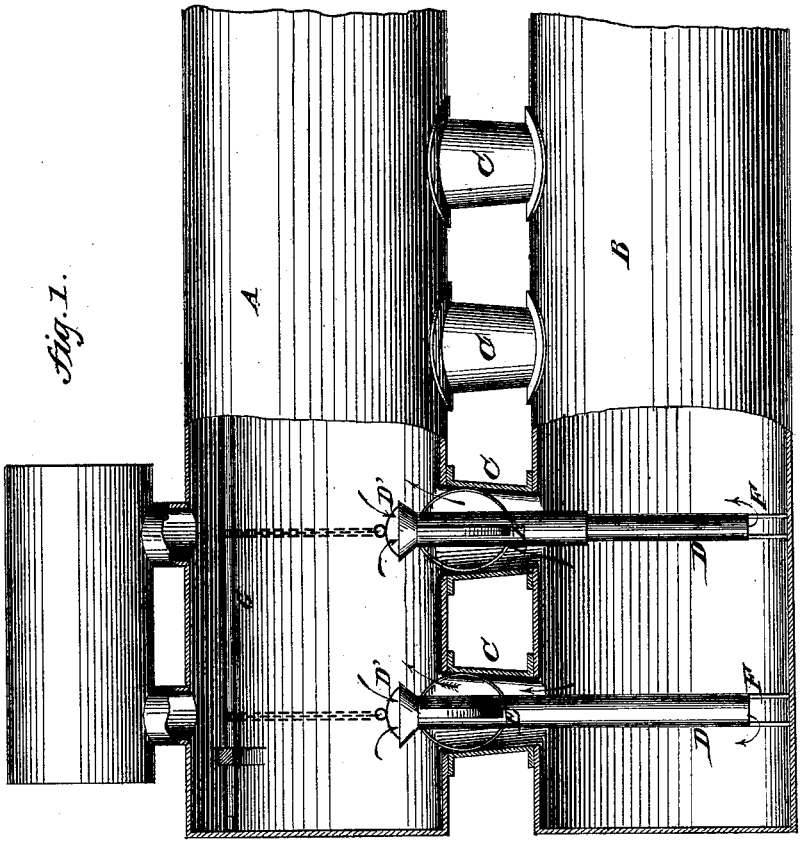
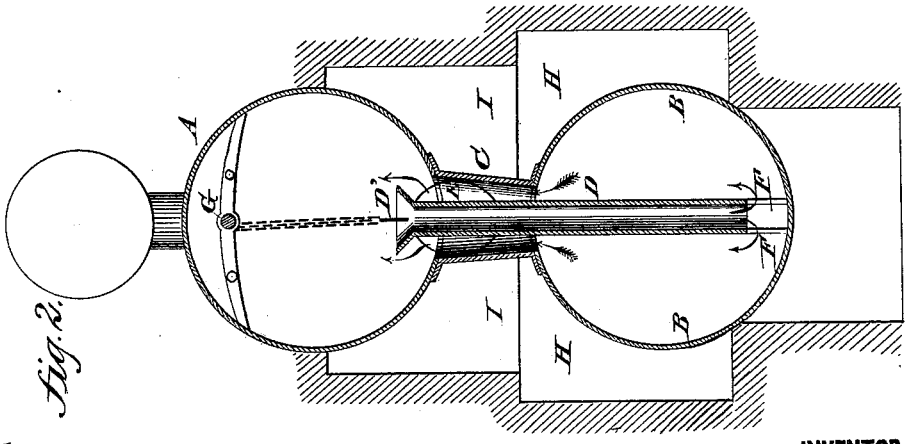


Fig. 2.



WITNESSES:

Gustave Dieterich

J. H. Scarborough.

INVENTOR:

H. S. Coleman.

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

HENRY S. COLEMAN, OF CHELMSFORD, ENGLAND.

IMPROVEMENT IN CIRCULATING DEVICES FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **190,743**, dated May 15, 1877; application filed March 12, 1877.

To all whom it may concern:

Be it known that I, HENRY SEPTIMUS COLEMAN, of Chelmsford, in the county of Essex, in that part of Her Majesty's Kingdom of Great Britain and Ireland known as England, agricultural-implement maker, have invented new and useful Improvements in Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention of improvements in steam-boilers has for its object to lessen the consumption of fuel, and to afford greater facilities for cleaning out the boiler; and it relates to that particular kind of boiler which is known as "double boiler," constructed of two barrels or shells, placed one above the other, and connected together at intervals by short vertical tubes, which, for the purposes of my invention, I prefer should be of truncated conical form, inverted.

My invention consists in the combination with, or employment in, a boiler of this construction of circulating-tubes, suspended within the tubes above referred to as connecting the two shells of the boiler, the said circulating-tubes being straight vertical tubes of about half the sectional area of the outer tubes, and extending upward a short distance into the upper shell, and downward to the bottom, upon which they are supported. The said inner tubes are so supported as to be readily removable out of the way for cleaning the boiler, and for this purpose I mount a rotating shaft in the upper shell, and connect all the tubes with it, so that they may be raised simultaneously. The tubes are also constructed in two parts, one sliding within the other, as hereinafter described.

In the accompanying drawing, Figure 1 is a longitudinal section, and Fig. 2 a transverse section, of a steam-boiler of the kind herein referred to, with my improvements applied.

A is the upper shell, and B the lower shell, of the boiler, connected at frequent intervals by short tubes C, of slightly conical form, the larger ends being uppermost, as shown, to facilitate the upward passage of the steam and water. D are the inner circulating-tubes, with flared ends D′ rising a few inches within the upper shell A, the said tubes D descending to about three or four inches from the bottom of the lower shell B. The tubes D are kept in position by three bent pieces of rod, E, fastened to the upper part of the pipes D, as shown, and fitting within the conical tubes C, so as to keep the inner tubes concentric with the outer ones. The tubes D are also supported by short legs F, resting on the bottom of the lower shell B.

The tubes D are open throughout, and the water circulates in the direction indicated by the arrows, the water from the upper shell descending through inner tubes D, while the heated water ascends between the inner tubes D and outer tubes C.

The water descending through the tubes D strikes against the bottom of the lower shell B, and by this scouring action effectually prevents the deposit of any sediment there, while the incrustation generally is much reduced by rapid circulation of the water throughout the two barrels of the boilers.

To facilitate the insertion and removal of the tube D, I prefer to construct them in two or several lengths, fitted to slide telescopically within one another, as shown; and in order to raise the whole of the tubes out of the way at once, I may mount a shaft, G, longitudinally in suitable brackets within the upper shell A of the boiler, and connect all the tubes D to said shaft by short lengths of chain.

By opening the man-hole in the upper shell A, and by turning said shaft G by a winch-handle applied to the square end thereof, the whole of the tubes D may be raised at once.

The boiler is set in brick-work, as usual, and is fired beneath the lower shell B, the products of combustion passing to the back end of the boiler, and returning through flues H H, inclosing the upper part of lower shell B, and again returning to the back end through flues I I, inclosing the tubes C and the lower part of the upper shell A; or the draft may be otherwise arranged.

Having now described the construction and operation of my invention, what I claim is—

1. The circulating-tubes, constructed in parts fitted to slide telescopically one in the other, as and for the purpose specified.

2. The combination of a rotating shaft, located within the upper shell of the boiler, and suitable suspending-chains, with the circulating-tubes, for raising them simultaneously, substantially as specified.

The above specification of my invention signed by me this 23d day of January, 1877.

HENRY SEPTIMUS COLEMAN.

Witnesses:
WM. CLARK,
T. W. KENNARD.