

(No Model.)

F. F. LANDIS.
STEAM BOILER ATTACHMENT.

No. 482,848.

Patented Sept. 20, 1892.

FIG. 1.

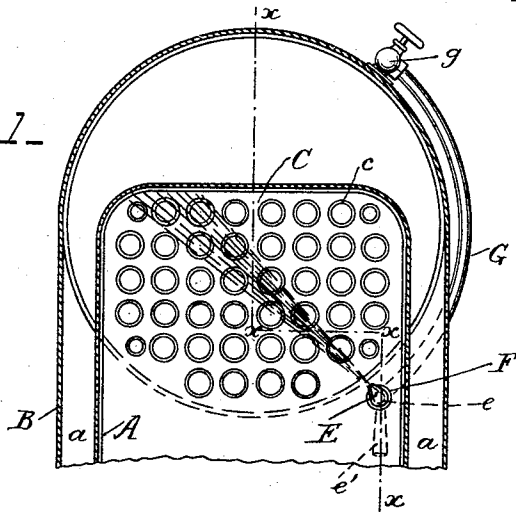
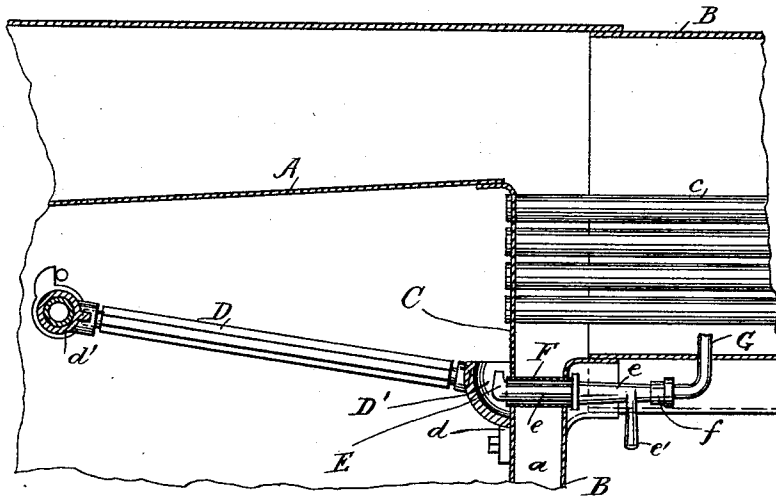


FIG. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

FRANK F. LANDIS, OF WAYNESBOROUGH, PENNSYLVANIA.

STEAM-BOILER ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 482,848, dated September 20, 1892.

Application filed May 28, 1892. Serial No. 434,737. (No model.)

To all whom it may concern:

Be it known that I, FRANK F. LANDIS, a citizen of the United States, residing at Waynesborough, in the county of Franklin and State of Pennsylvania, 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 appertains to make and use the same.

This invention relates to steam-boilers, and more particularly to steam-boilers specially adapted for burning straw and used for traction and portable steam-engines.

This invention consists of the novel construction and combination of the parts, hereinafter fully described and claimed, and by means of which the ends of the boiler-tubes are freed from accumulations of slag and ashes formed during the combustion of the straw.

In the drawings, Figure 1 is a front view of the tube-plate of a boiler, showing part of the shell and the fire-box in section. Fig. 2 is a longitudinal section through a portion of the boiler, taken on the line *x x* in Fig. 1 and showing a side view of the steam-jet attachment.

A is the fire-box of the boiler, and B is the outer shell, a water-space *a* being formed between these parts in the usual manner.

C is the tube-plate, and *c* are the tubes, having their ends secured in the tube-plate.

D is the baffle-plate, and *d d'* are the supports for the baffle-plate. The support *d* is secured to the tube-plate below the tubes and is provided with the recess *D'* next to the tube-plate.

The remaining parts of the boiler and its plate differ in no essential respect from those shown and described in the two patents issued to me, No. 456,149, dated July 21, 1891, and No. 464,305, dated December 1, 1891.

In firing a boiler with straw it is found that the tubes have to be large in diameter to prevent them from choking up and that on account of the silica contained in the straw and the dirt and rubbish mixed in with it considerable quantities of glass or slag are formed in the furnace. Portions of this slag are drawn over against the tube-plate by the draft through the tubes, together with portions of

the burning straw, and the glass is also formed against the tube-plate around the orifices of the tubes. The slag or glass and the ashes mixed with it soon choke up the ends of the tubes and the accumulations have to be removed every few hours.

For the purpose of clearing the ends of the tubes a steam-nozzle E is provided. A tube F is secured in the fire-box and in the outer shell of the boiler at one side of the tube-plate below the tubes, so that no water can leak out of the water-space *a*. A pipe *e* is loosely journaled in the said tube F and terminates in the upwardly-projecting nozzle E inside the fire-box, and this nozzle is arranged to come in the said recess *D'*, so that it is not subject to the direct impingement of the flame in the fire-box. A handle *e'* and a stuffing-box *f* are formed on the pipe *e* outside the boiler.

G is a pipe provided with a valve *g* at its upper end, which communicates with the steam-space of the boiler. The other end of the pipe G is operatively connected with the stuffing-box *f* on the end of the pipe *e* outside the boiler. When the ashes and glass accumulate upon the projecting ends of the tubes, the valve *g* is opened and steam is allowed to pass out of the boiler through the nozzle. The steam strikes against the glass and ashes and causes the glass to contract suddenly and break away from the metal. The steam blows away the broken particles and they are carried through the tubes by the draft. The handle *e'* is turned back and forth while the steam is issuing from the nozzle, so that the nozzle is partially revolved and the steam is directed across the ends of all the tubes.

What I claim is—

1. In a boiler, the combination, with the outer shell, the fire-box provided with a tube-plate, and a series of tubes, of a water-tight tube passing through the shell and the tube-plate, a pipe passing through the said tube and provided with a nozzle inside the fire-box and having a handle for oscillating it outside the boiler, and a pipe provided with a valve and operatively connected with the aforesaid pipe and with the interior of the boiler, whereby a jet of steam may be directed across the ends of all the tubes, substantially as set forth.

2. The combination, with a boiler provided with a series of horizontally-arranged fire-

tubes, of a steam-nozzle arranged crosswise of the ends of the tubes inside the fire-box and means for oscillating said nozzle, whereby the steam may be directed across all the tubes, substantially as set forth.

3. The combination, with a boiler provided with a series of horizontally-arranged tubes and a support for the baffle-plate, secured to the tube-plate below the tubes and having a recess D', of a steam-nozzle arranged in the said recess and directed crosswise of the ends

of the tubes, whereby the steam may be directed across the tubes and the nozzle preserved from direct contact with the flame, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK F. LANDIS.

Witnesses:

HERBERT W. T. JENNER,
DANIEL S. BEARD.