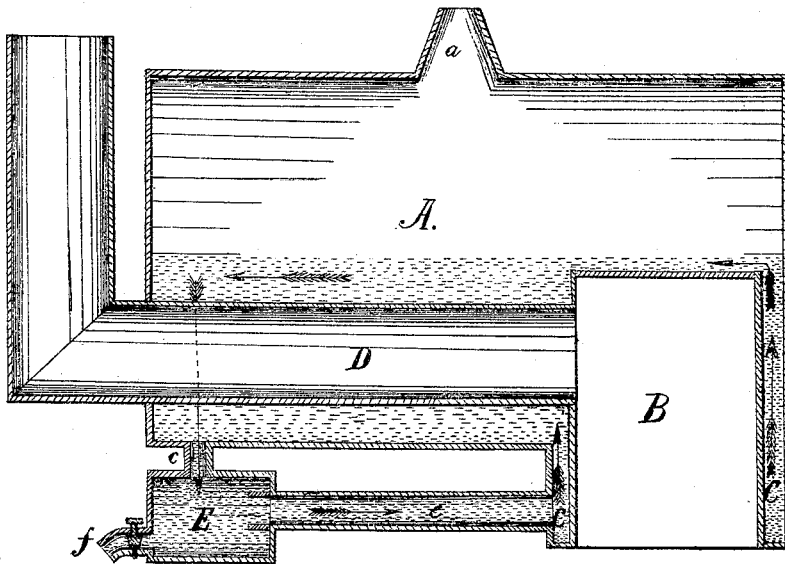


F. A. WOODSON.

Improvement in Steam-Boilers.

No. 114,503.

Patented May 2, 1871.



Witnesses:

Parker H. Sweet, Jr.
W. J. Peyton

Inventor:

Fredrick A. Woodson

UNITED STATES PATENT OFFICE.

FREDERICK A. WOODSON, OF SELMA, ALABAMA.

IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. **114,503**, dated May 2, 1871.

To all whom it may concern:

Be it known that I, FREDERICK A. WOODSON, of Selma, in the county of Dallas and State of Alabama, have invented a new and useful Improvement in Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description thereof, sufficient to enable others skilled in the art to which my invention relates to make and use the same, reference being had to the accompanying drawings, making part of this specification, in which the figure is a central vertical longitudinal section.

This invention relates to the formation of a continuous passage for the circulation of water in the boiler from the cold to the hot end thereof. It consists in securing to and underneath the colder end of the boiler a drum or cylinder, connected by tubes with the cold end of the boiler and the water leg or jacket around the fire-box, and also in such a construction of the several parts as will secure a rapid, equal, and constant circulation of the water and generation of steam.

The object sought and accomplished by my invention is the perfect circulation of the water in the boiler in proportion to the heat applied, the prevention of incrustation in and the removal of sediment from the boiler.

In the drawing referred to, the letter A represents an ordinary steam-boiler. B is the fire-box, and C the water-jacket surrounding it. E is the mud drum or cylinder, placed under the cold end of the boiler, and connected therewith by the tube *e*, and to the throat-sheet of the fire-box or water jacket by the tube *e*. D represents a flue and its connection with the smoke-stack and fire-box.

Water having been supplied to the boiler and the fire kindled, steam is soon generated and ascends directly to the dome *a* or the upper part of the boiler. The atom of hot water converted into steam is immediately replaced by an atom of colder water from the front of the boiler, through the mud-drum and its tubes. This is then likewise heated, vaporized, and replaced, and so on infinitely, until a circulation takes place, in the manner substantially shown by the arrows, and by which circulation colder water is constantly fed to the hot end,

and the generation of steam as constantly carried on, and, by its immediate ascent to the dome, the cylinder is supplied with dry steam. By means, also, of this same constant current the sediment is carried down into the mud-drum, wherein an eddy is formed, and whence it is blown off through the cock *f*, provided for that purpose.

The advantages gained by this circulation are, the reduction of the causes of boiler-explosions, in this, that it prevents overheating and unequal expansion of the plates; prevents repulsion of water; it prevents the deposit of sediment in those parts of the boiler exposed to the heat, and consequently increases the duration of the boiler. This circulation is carried on as well when the engine is at rest as when in motion. Furthermore, by this circulation, as soon as generated, the steam ascends to the dome without colliding with the descending water, and consequently is drier and more effective in the cylinders than that usually made. Another advantage gained is, that the pressure on the mud-drum from two directions expels the deposits therein with small loss of hot water. It can be fitted to any kind of railroad, marine, or stationary boiler, and works automatically.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. When applied to a horizontal internal-flue boiler, the pipe *e*, connecting the mud-drum E with the boiler A, and forming a continuous passage for mud and sediment together into the mud-drum, with the straight pipe *e*, connecting the mud-drum and water-leg of the boiler, all in combination, substantially as and for the purpose set forth.

2. A horizontal projection or flange of the pipe extending into the mud-drum, for the purpose of circulating the clear water above the settlings into the hot end of the boiler, substantially as described.

To the above I have signed my name this 28th day of February, A. D. 1871.

FREDERICK A. WOODSON.

Witnesses:

W. J. PEYTON,
W. H. FINCKEL.