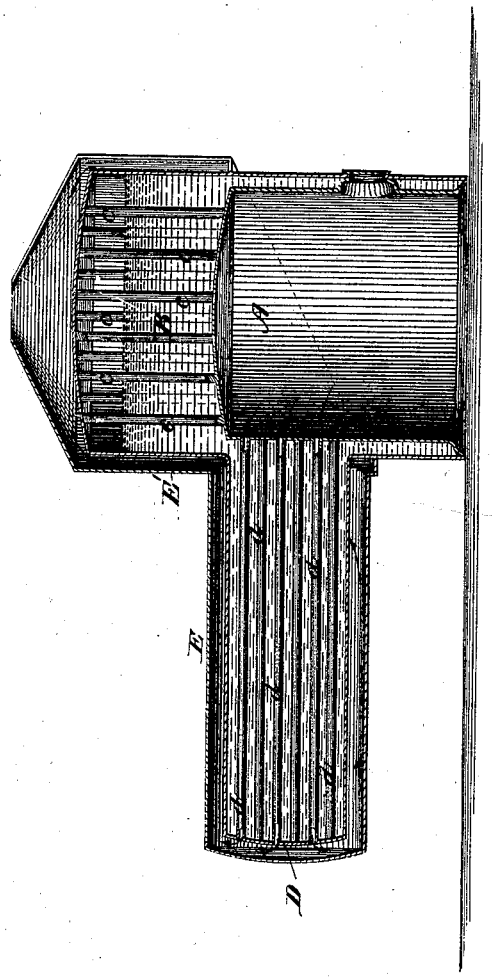
C. M. MILLER.

Portable Steam-Boilers.

No. 203,750. Patented May 14, 1878.



WITNESSES

Harry King

Wm Blackstock

INVENTOR

Cassius M. Miller

By Hill & Ellsworth

His ATTORNEYS.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CASSIUS M. MILLER, OF CANTON, OHIO.

IMPROVEMENT IN PORTABLE STEAM-BOILERS.

Specification forming part of Letters Patent No. **203,750**, dated May 14, 1878; application filed March 28, 1878.

To all whom it may concern:

Be it known that I, CASSIUS M. MILLER, of Canton, in the county of Stark and State of Ohio, have invented an Improved Portable Steam-Boiler; and I do hereby declare the following to be a full and exact description of the same, which will enable any one skilled in the art to which it appertains or with which it is most nearly connected to make and construct the same, reference being had to the accompanying drawing, and to the letters of designation marked thereon.

The object of this invention is to produce a light, strong, and cheap portable boiler, which shall have great capacity for generating steam and holding it at the requisite temperature to produce its best effects; and the invention consists in the construction of the boiler, as I will now proceed to describe.

In the drawing, which represents a longitudinal vertical section of the invention, A indicates the furnace, and B the vertical boiler, arranged directly over it, the top plate of the boiler being connected to the crown-sheet of the furnace by means of stay-rods CC, properly secured.

D represents the horizontal extension of the boiler, having a set of tubes, *d d*, open at both ends, and having a water-space connected with that of the boiler B; and E E′ represent a jacket, which surrounds the horizontal extension, the vertical boiler, and the upper part of the furnace, and terminates in a conical top, which opens into the smoke-stack. All the parts are to be properly and adequately stayed and supported.

The entire furnace, or so much thereof as may be preferred, may be surrounded with a water-space connecting with the two parts of the boiler.

The volatile products of combustion pass from the furnace through the horizontal extension, and are discharged at its farther extremity into the space inclosed by the jacket E E′. They then pass back around the horizontal extension and up around the vertical boiler, and are discharged into the smoke-stack after serving to heat the water in both portions of the boiler, and superheat the steam in the upper part of the vertical boiler. The water, being always above the bottom of the boiler B, keeps the horizontal fire-flues at all times submerged and prevents them from burning out.

When the apparatus is used in connection with agricultural machines designed to be transported on wheels, the horizontal extension of the boiler and smoke-flue will serve, in whole or in part, as a "reach" to connect the front and rear axles of the carriage, thus simplifying the construction and saving cost.

The arrangement of both parts of the boiler within the smoke-flue, and the application of the heat to them in the manner substantially as described, generates steam very rapidly and prevents it from condensation—in fact, actually tends to superheat it in the steam-dome or space—whence it is taken to the engine, so that it can be used with the greatest practical advantage and economy.

By constructing the boiler in the manner described, one part being vertical and the other horizontal, and both combined with the jacket, I produce a boiler having all the essential features of a locomotive, vertical and stationary or arched boiler. Part of the boiler being vertical renders it capable of great inclination without injury, and part being horizontal, the tubes are submerged, as in a locomotive-boiler.

By the return of the heat there is practically as large heating-surface as in the common stationary boiler.

I claim as my invention—

A vertical steam-boiler having a horizontal extension arranged below the line of the crown-sheet, through which the smoke, hot air, &c., pass directly from the furnace by means of tubular flues, and thence pass around said extension and the upper part of the vertical boiler through the flue formed by an inclosing-jacket, for the purpose of heating the water in the extension and in the vertical boiler above the crown-sheet of the furnace, substantially as described.

CASSIUS M. MILLER.

Witnesses:

JEFF. A. HOUSER,
M. E. BOOTH.