(No Model.)

C. E. PARKER.

STEAM BOILER.

No. 524,115. Patented Aug. 7, 1894.

Fig. 1.

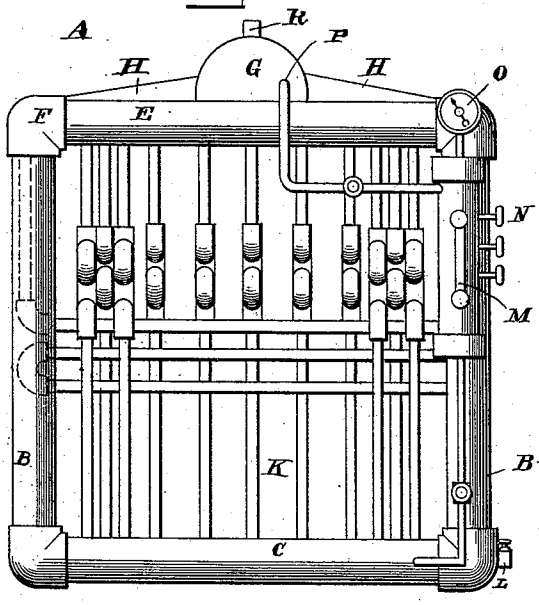


Fig. 2.

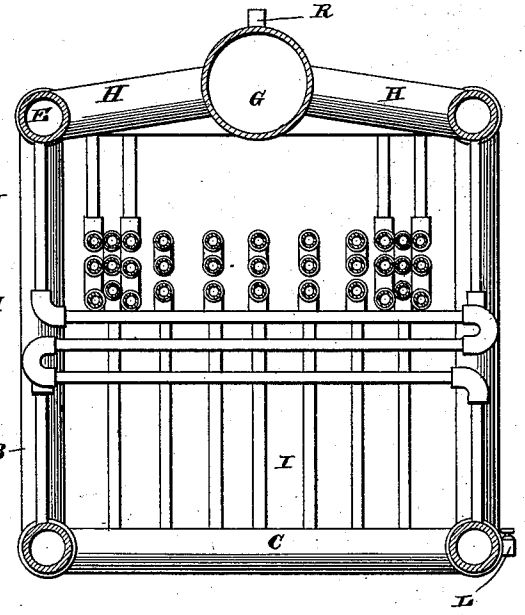
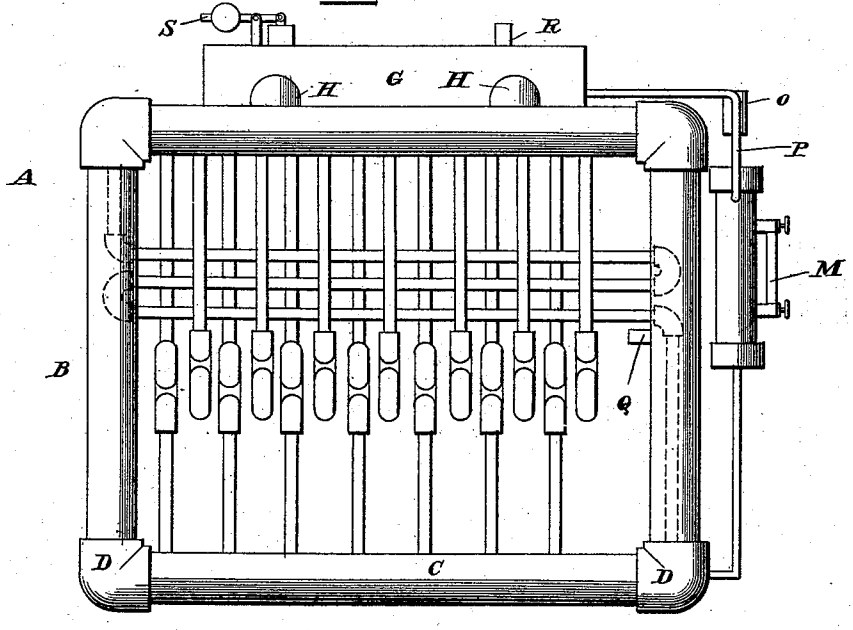


Fig. 3.



WITNESSES

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CHARLES E. PARKER, OF ORANGE, TEXAS.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 524,115, dated August 7, 1894.

Application filed May 28, 1894. Serial No. 512,814. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. PARKER, a citizen of the United States, residing at Orange, in the county of Orange and State of Texas, have invented certain new and useful Improvements in Steam-Boilers; and I do 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, reference being had to the letters of reference marked on the accompanying drawings, which form a part of this specification.

My invention relates to steam generators.

The object of my invention consists in producing a water-tube steam generator, which shall be simple in construction, easily repaired, interchangeable parts, and rapid and effective steaming qualities.

For these purposes my invention consists in the following construction and combination of parts, the details of which will first be fully described, and the features of novelty therein then set forth and claimed.

Figure 1 is an end elevation of a steam boiler embodying my invention. Fig. 2 is a vertical transverse section of the same. Fig. 3 is a side elevation of the steam boiler.

In the drawings—A represents the boiler as a whole. It consists preferably of four large vertical circulation tubes B, which also serve to support the weight of the parts of the boiler. The boiler is of rectangular shape.

C represents four large horizontal circulating pipes, one at the base of and parallel with the four sides of the boiler, and communicating with the four vertical circulation tubes B, by the three-way couplings D.

E are four corresponding horizontal circulating tubes, communicating with the top of the vertical tubes B by three-way couplings F, and form the upper edges of the boiler structure.

G is the water reservoir and superheater, horizontally placed at about the level, or a little above, of the circulation tubes E. H are branch circulation tubes of which there are preferably four, two on each side of the reservoir G, which serve as a free communication between the opposite pair of circulation tubes E and the reservoir.

All the tubes previously described are of much larger diameter or size than the steaming tubes proper, hereinafter described, so as to constitute a rigid and substantial frame-work for the support of the water-tubes in more immediate contact with the fire, and at the same time to provide a means of free circulation of the water continuously through the tube and allow the proper separation of the steam.

I represents one of the series of the water-tubes, each of which is connected to and starts from one of the bottom circulation-tubes C, and passes vertically upward to a proper height above the fire-box and below the reservoir G, whence it passes horizontally across the boiler several times, by means of the return-bend coupling, and is finally led up to and connected with diagonally opposite upper horizontal circulation tube E. All the water-pipes I are disposed in the same manner.

A second series of return-bend water-tubes K are disposed substantially in the same manner as the series of tubes I, only that their arrangement is at right angles to that of the series of tubes I, the series K starting from the opposite pair of lower circulation tubes C and ending in the upper opposite pair of circulation-tubes E.

In both series of water-tubes I and K, each pipe in the series rises alternately from opposite sides of the circulation tubes C and end in a similar manner in the upper circulation-tubes E.

To provide a suitable opening for the admission of fuel, several of the pipes in the series K are omitted, as shown in Figs. 1 and 2. It has not been deemed necessary to show a brick-work or casing around the tubes, or a fire-box or ash-pan.

L is the feed-pipe.

M is the water-gage, and N the gage-cocks.

O is the steam-pressure indicator, and P the pipe connecting the superheater with the water-gage cylinder.

Q is the fusible safety plug, and R the pipe-connection for the live-steam pipe.

S is the safety-valve.

In operation, the water being subjected to the products of combustion it becomes heated, and that portion being of lighter specific gravity than the colder portion, it rises in the water-pipes I and K and circulation-tubes, the

steam being separated in the reservoir G from the water.

No matter how intense the heat or the temperature of the water that portion of it which is more remote from the fire than that in immediate contact with the fire will be relatively, or comparatively cooler and consequently of greater specific gravity. Consequently there is a continual downwardly flowing current through the outer tubes B into the tubes C, and upwardly through the series of water-tubes I and K to the tubes E, H and reservoir D, and downwardly again, as before, continuously.

I claim—

1. In a steam-boiler the combination of a rectangular series of circulation tubes at the base of the boiler, disposed horizontally, a rectangular arrangement of horizontal tubes at the top of the boiler, a series of four vertical circulation tubes uniting each of the four corners of the lower horizontal with each of the corners of the upper horizontal circulation tubes, a series of water-tubes and a steam dome or reservoir connected with said circulation-tubes.

2. In a steam boiler, the combination of the upper rectangular horizontal circulation tubes, a steam dome or reservoir placed within and supported by said rectangular circulation tubes, and a series of inclined circulation tubes connecting the steam dome at intermediate points along the opposite sides with intermediate points along the opposite sides of the rectangular circulation tubes all of said tubes being of substantially the same capacity.

3. In a steam-boiler, the combination of a boiler of rectangular or square form, having a rectangular series of circulation tubes surrounding the sides of each of the six faces or sides of the boiler, a series of return-bend water-tubes connected with the circulation tubes, and another series of return-bend water-tubes disposed at right angles to the first series, and connected with the circulation tubes.

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