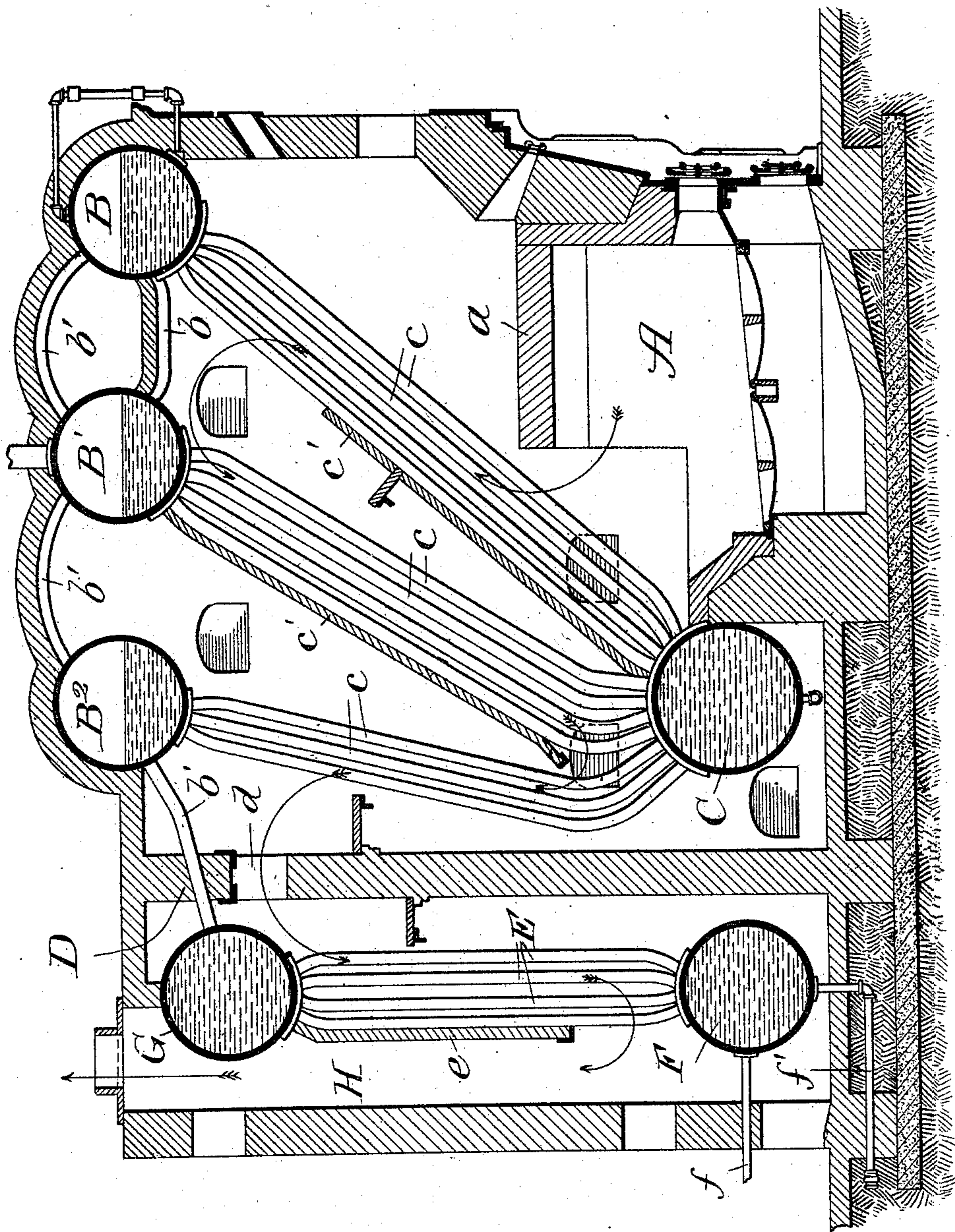


(No Model.)

H. S. PELL.
STEAM BOILER.

No. 571,282.

Patented Nov. 10, 1896.



Witnesses:
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UNITED STATES PATENT OFFICE.

HARRY S. PELL, OF AKRON, OHIO, ASSIGNOR TO THE STIRLING COMPANY,
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STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 571,282, dated November 10, 1896.

Application filed December 22, 1893. Serial No. 494,404. (No model.)

To all whom it may concern:

Be it known that I, HARRY S. PELL, a citizen of the United States, residing at Akron, Ohio, have invented certain new and useful
5 Improvements in Steam-Boilers, of which the following is a specification.

The object of my invention has more particular reference to tubular steam-boilers of the general type shown and described in the
10 Stirling patent, No. 479,678, issued July 26, 1892; and my invention consists in the features and combinations hereinafter described and claimed.

The drawing represents a transverse vertical section of my improved tubular boiler.

In making my improved steam-boiler I make a fire-chamber A of the desired size and cover it with an arch *a*. I arrange water and steam drums B and B' and B² in the upper part of the boiler and connect the first
20 two of them with water-pipes *b* and steam-pipes *b'*, which steam-pipes are also used to connect the last two of the drums mentioned.

I arrange in the lower part of the boiler a
25 drum C, which is intended to be connected with and suspended from the three upper drums mentioned by a series of tubes *c*, so as to afford communication between them. Deflecting-plates *c'* and *c'* are arranged behind
30 the series of tubes connecting the drum C and the drums B and B', so as to deflect the heat and products of combustion upward through the one series of tubes and down through the other, as indicated by arrows, in
35 order to expose as great a portion of their length as practicable to the heat. Up to this point I have simply described in general terms the construction shown in the Stirling patent referred to, and reference may be had
40 to such patent for a more minute and detailed description of the construction and operation of the parts. While using these parts which are found in the Stirling construction, I do not in all cases, however, lead the heat and
45 products of combustion directly from the last series of tubes up and out through the smoke-stack; but I prefer to arrange a wall or deflecting-plate D at the back of the last series of tubes. If a wall is used, as shown in the
50 drawing, I provide it with an opening *d* in its upper portion, through which the heat and

products of combustion are drawn, so as to come into contact with another series of tubes E, which connect a lower drum F and an upper drum G, so as to afford communication
55 between them. This upper drum is connected with the drum B² by pipes *b'*, while the lower drum is connected by a pipe *f* to a source of water supply. It is also provided with a blow-off pipe *f'*. The series of tubes E has
60 arranged behind it a deflecting-plate *e*, so as to cause the heat and products of combustion after coming into contact with such tubes near their top to pass down through them before entering the flue H, which leads to the
65 smoke-stack.

In operation the water supply to the boiler enters from the source of supply through the pipe *f* into the lower drum F. It is intended that the sediment which may be contained in
70 the water will to a certain extent be precipitated and caught in this drum. The water passes up through the series of tubes E into the water-drum G. This drum is preferably
75 arranged on a somewhat lower plane than the steam and water drums, so that it will be constantly kept filled with water. It may also be supplied with a valve (not shown) to permit the escape of any air that may get in.
80 The water passes from the drum G through the water-pipes *b* into the steam and water drum B². This drum has communication through the pipe *b'* with the steam-space of the drum B', so that its upper portion will be
85 kept filled with steam, thus exerting a pressure on the water to facilitate its feeding. The water from the drum B² passes through the series of tubes connecting it with the lower drum C, whence it passes up through the series
90 of pipes connecting the drum C with the steam and water drums B and B'. Through means of the water communication *b* a circulation is maintained through these drums and their connecting series of tubes.

What I regard as new, and desire to secure
95 by Letters Patent, is—

1. In a water-tube boiler, the combination of a lower feed-drum communicating with a source of water supply, a rear elevated drum, pipes connecting the feed-drum with the rear
100 elevated drum, a middle elevated drum, pipes connecting the rear and middle elevated

drums, a lower mud-drum, pipes connecting the middle elevated drum with the mud-drum, a front elevated drum or drums, pipes connecting the mud-drum with the front elevated drum or drums, and means for drawing off steam from the middle and front elevated drums, whereby water may be introduced into the lower feed-drum, carried up to the rear elevated drum, across to the middle elevated drum, down to the mud-drum, and up to the front elevated drum or drums, substantially as described.

2. In a water-tube boiler, the combination of three elevated steam and water drums, B and B' and B², a lower drum, C, series of

tubes connecting the lower drum with each of the elevated drums, pipes affording steam and water communication between the drums, B and B', and steam communication between the drums B' and B², a lower feed-water drum, F, an elevated feed-water drum, G, a series of tubes connecting such drums, tubes affording water communication between the drums G and B², and means for supplying water to the lower feed-water drum, substantially as described.

HARRY S. PELL.

Witnesses:

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