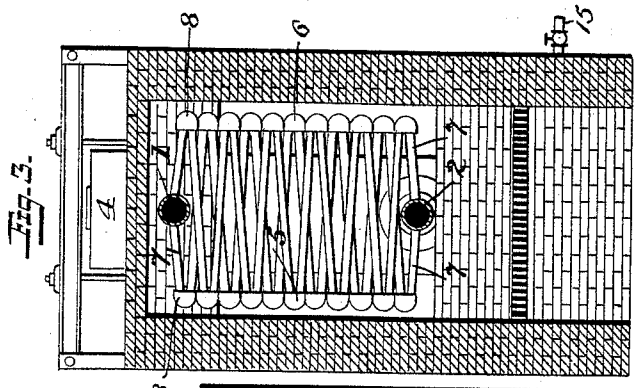
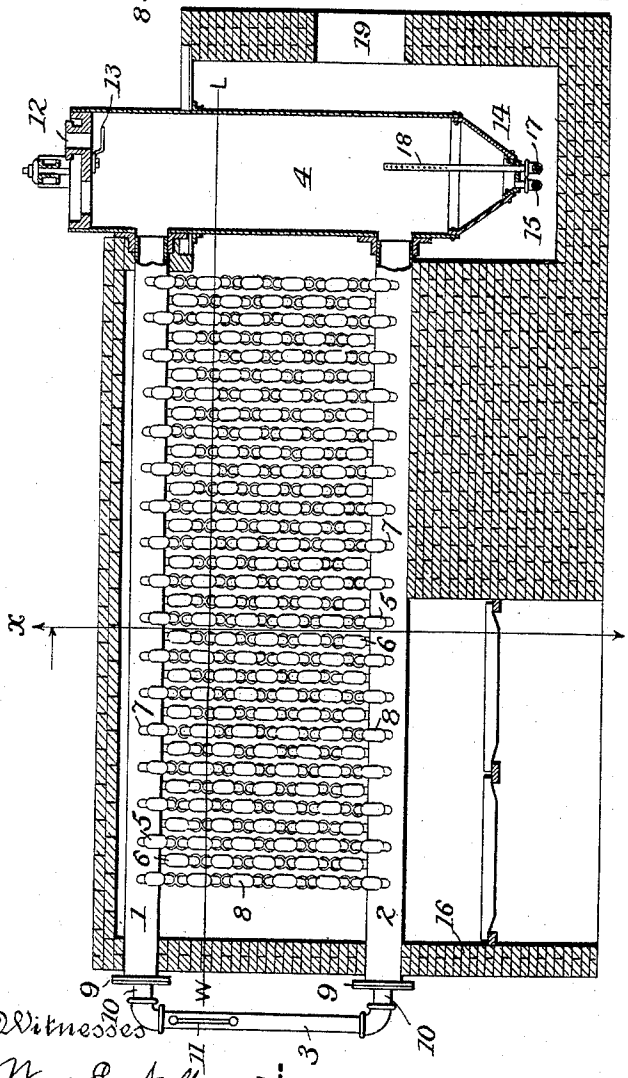
(No Model.)

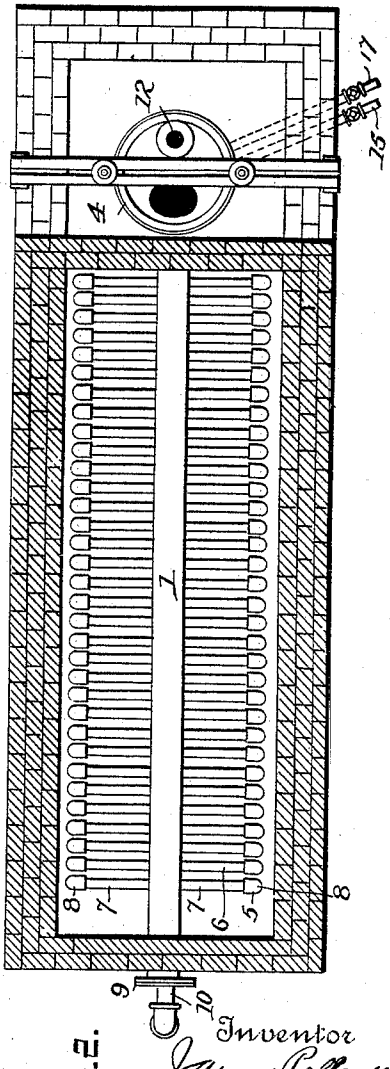
J. POLLOCK.

STEAM BOILER.

No. 482,459. Patented Sept. 13, 1892.







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UNITED STATES PATENT OFFICE.

JAMES POLLOCK, OF WILKES-BARRÉ, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE WYOMING BOILER COMPANY, LIMITED, OF SAME PLACE.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 482,459, dated September 13, 1892.

Application filed May 13, 1892. Serial No. 432,892. (No model.)

To all whom it may concern:

Be it known that I, JAMES POLLOCK, a citizen of the United States, residing at Wilkes-Barré, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification.

My invention relates to steam-boilers; and it consists in an improved construction of water-tube boiler.

The object of my invention is to produce a boiler of this variety which shall be easily accessible for cleaning, simple and cheap in its construction, and which will produce dry and more or less superheated steam, a great objection to the water-tube boilers at present in use being that the steam generated carries with it a great deal of water.

I will now proceed to describe my improved boiler, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a side elevation, partly in section, of the boiler and its furnace. Fig. 2 is a plan view of the same, and Fig. 3 is a section on the line *x x* of Fig. 2.

The principal parts of the boiler are a horizontal steam-drum 1 at the top and a horizontal water-drum 2 at the bottom, a vertical pipe 3, connecting the forward ends of the drums, a vertical chamber 4, communicating with the rear ends of the drums, and two series of zigzag pipes 5 6, arranged between the drums within the furnace. The zigzag sections or pipes 5 of one series are fitted to one side of the steam-drum and to one side of the water-drum, and the sections 6 of the other series are fitted to the opposite sides of the drums and cross and recross the sections 5 a number of times, thus forming a maze of pipes through which the hot gases from the furnace are compelled to travel. The upper and lower members 7 of the zigzag sections are reversely threaded at their ends and screw into the drums and the return-bends 8. Any section of the zigzag pipes may be quickly removed by simply unscrewing the portions 7 at its top and bottom, and, if necessary, a new coil of pipe may be substituted, the coils being all exactly alike and interchangeable.

The front ends of the drums are closed by plates 9, bolted to flanges on the drums, and these plates are tapped to receive short pipes 10, to which the vertical pipe 3 is attached. The pipe 3 is tapped above and below the water-line "W L," to receive the ends of a glass gage 11 for indicating the level of the water in the boiler.

As above stated, a great objection to water-tube boilers is that a large amount of moisture in the form of water is carried off with the steam. This is partly due to the fact that a portion of the steam is formed considerably below the water-line, and in passing through the narrow tubes to the steam-drum it necessarily agitates the water violently and tends to carry off a considerable amount of it. Furthermore, it has been considered necessary heretofore to keep the tubes full of water to prevent them from burning out. I have found that portions of the tubes may be safely and profitably located above the water-line and that the water carried up by the steam will be vaporized in the heated tubes and at the same time keep the temperature of the tubes down to prevent injury to them. Thus the steam is rendered dry and partially superheated.

As an extra precaution against wet steam I take the steam from a port 12 in the upper part of the enlarged casing or chamber 4, where the water is less agitated than in the tubes, and I locate a baffle-plate 13 opposite said port. The casing or chamber 4 is preferably cylindrical, except at the bottom, where it terminates in a conical section 14 and a blow-off pipe 15. The steam-drum 1 is riveted to the upper part of the casing and the drum 2 is riveted to the lower portion. The casing 4 acts as a setting-chamber, as the water-currents in it are very sluggish and the bulk of the dirt and impurities in the water settle into the conical bottom and may be readily drawn off through the blow-off pipe 15. Should any dirt accumulate in the drums, it can be readily removed by taking off the plates 9 and inserting a suitable flue-cleaner. For this purpose the drums are extended through the front wall 16 of the furnace.

The feed-water may be introduced into the

boiler at any point; but I prefer to connect the feed-pipe 17 to the casing 4 near its lower end and to provide its inner end with a perforated or spray pipe 18. In this way the coolest water in the boiler is always nearest the flue 19, where the gases pass out of the furnace, and in this way the escaping gases are reduced to the lowest possible temperature and the greatest economy obtained.

What I claim, and desire to secure by Letters Patent, is—

1. In a steam-boiler, the combination of the horizontal steam-drum, the horizontal water-drum, the vertical connections 3 4 at the ends of said drums, and the two series of zigzag pipes connecting said drums, substantially as described.

2. In a steam-boiler, the horizontal steam and water drums having their forward ends extending through the front wall of the furnace and provided with removable covering-plates, the vertical pipe 3, communicating with the forward ends of the drums, the enlarged casing 4, with which the rear ends of the drums communicate, and the zigzag pipes arranged in two series and communicating with both of said drums, substantially as described.

3. The combination, with the horizontal drums, the zigzag tubes connecting said drums, and the vertical pipe 3, extending between the forward ends of said drums, of a vertical casing 4 in communication with the rear ends of the drums, said casing having a steam-outlet at the upper end and a conical bottom and blow-off pipe at its lower end, substantially as described.

4. The combination, with horizontal steam and water drums, of two series of zigzag pipes connecting said drums, an enlarged cylindrical casing connected to the rear ends of said drums, a steam-outlet at the upper end of the casing, a perforated water-inlet pipe near the lower end of the casing, and a blow-off pipe 15 at the bottom of the casing, substantially as described.

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

JAMES POLLOCK.

Witnesses:

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JOHN C. SWEENEY.