(No Model.)

# W. H. BURDICK.

## STEAM BOILER.

No. 362,422. Patented May 3, 1887.

Fig. 1.

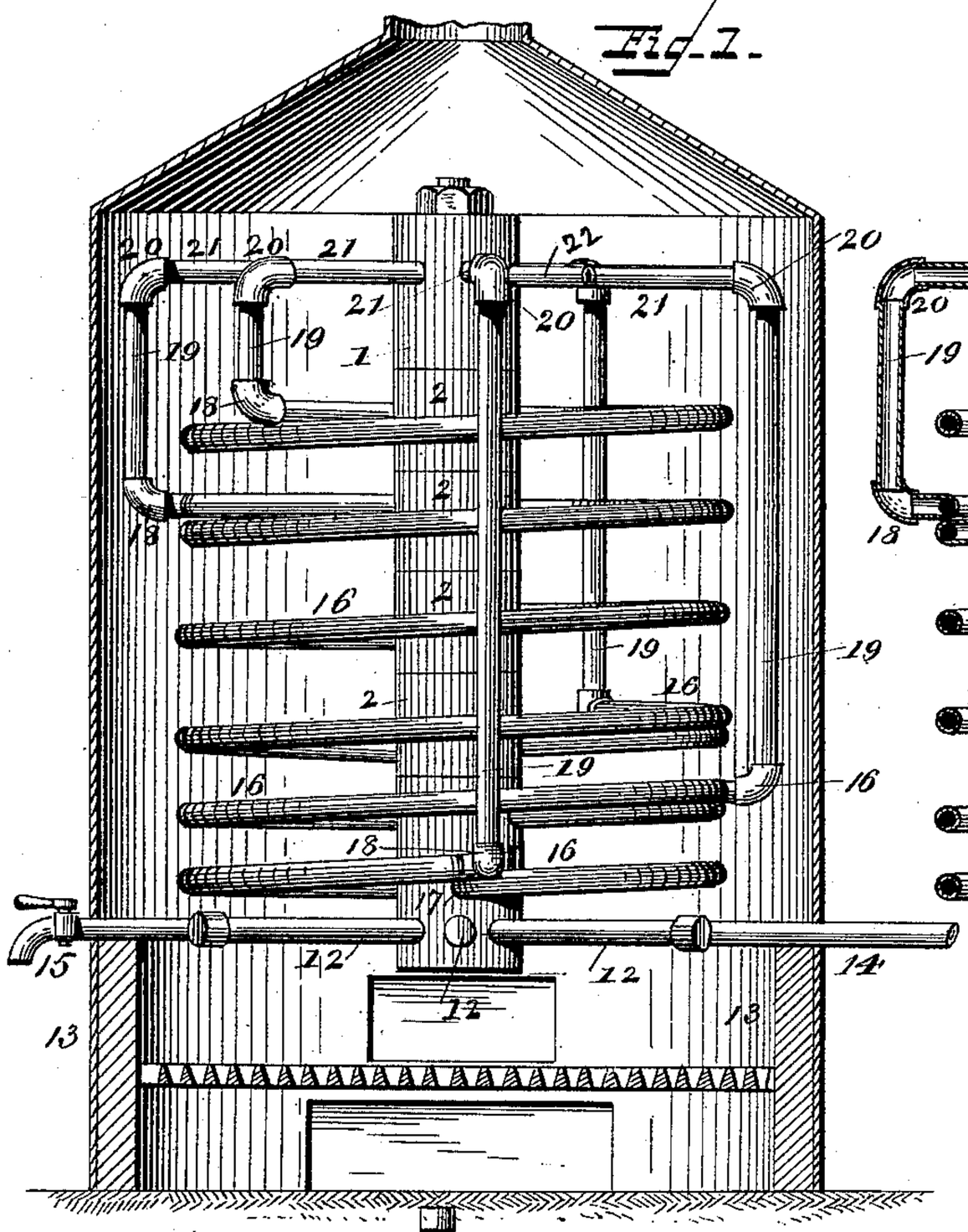


Fig. 2.

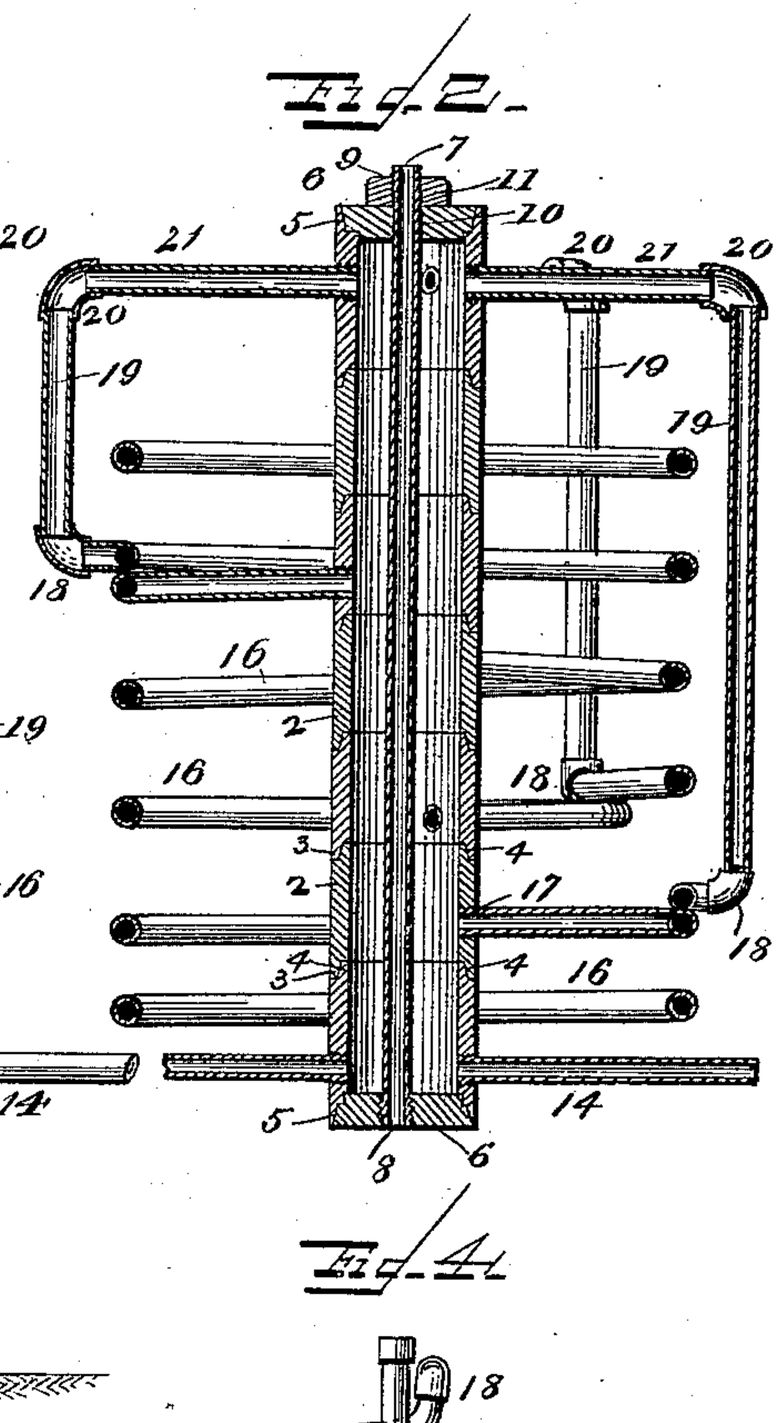


Fig. 3.

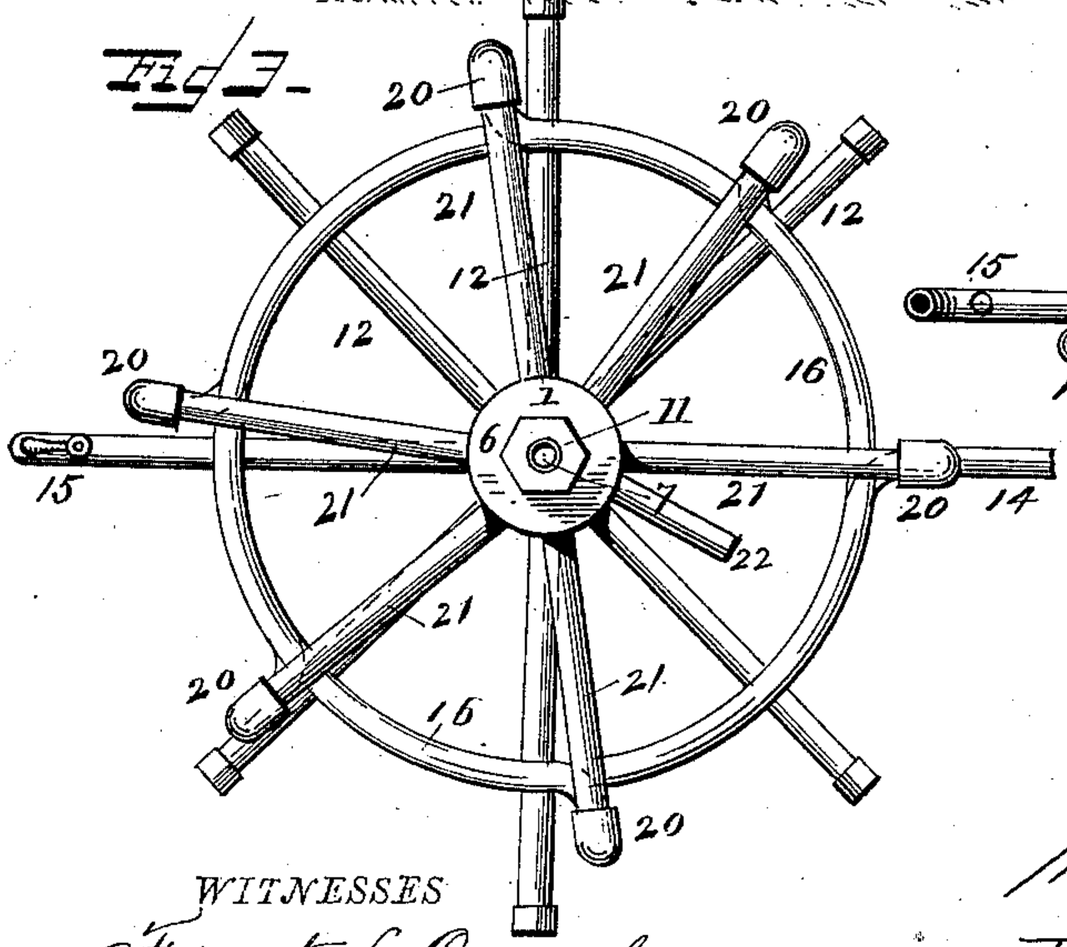
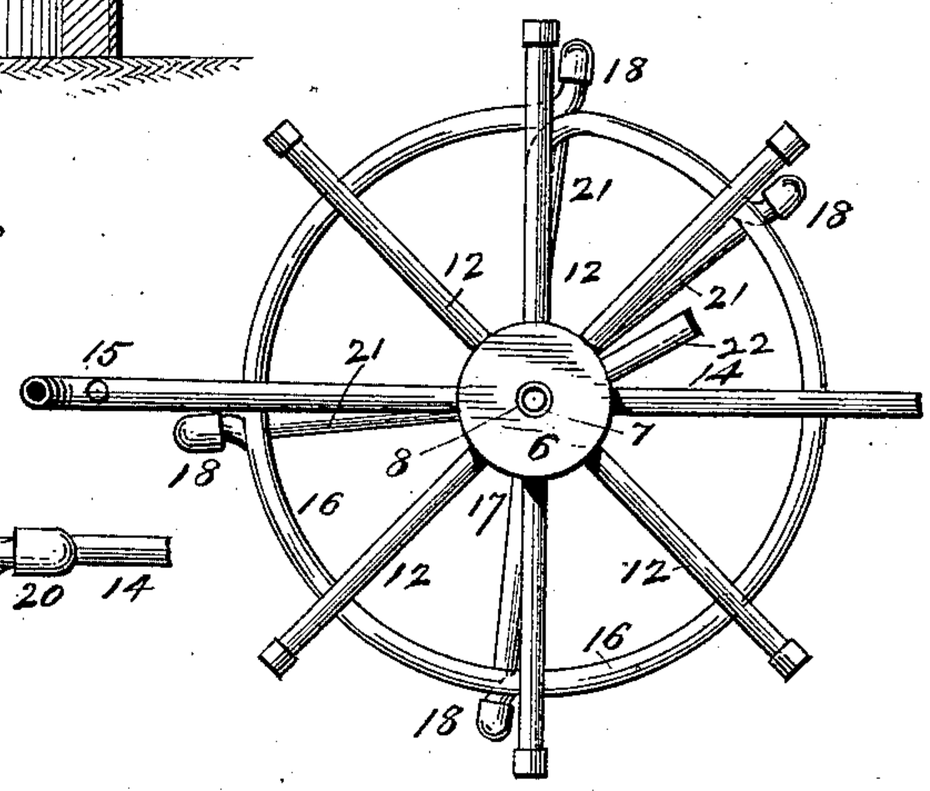


Fig. 4.



WITNESSES

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# UNITED STATES PATENT OFFICE.

WALTER H. BURDICK, OF RACINE, WISCONSIN.

## STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 362,422, dated May 3, 1887.

Application filed February 11, 1887. Serial No. 227,297. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER H. BURDICK, a citizen of the United States, and a resident of Racine, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a side view of my improved boiler. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a top view, and Fig. 4 is a bottom view.

Similar numerals of reference indicate corresponding parts in all the figures.

My invention has relation to that class of steam-boilers which are composed of a number of coiled tubes or pipes inserted in a suitable furnace and opening with their upper ends into a steam-dome or steam-space; and it consists in the improved construction and combination of parts of such a steam-boiler, as hereinafter more fully described and claimed.

In the accompanying drawings, the numeral 1 indicates a central cylindrical chamber composed of a number of sections, 2, having reduced and shouldered upper ends, 3, with which they fit into corresponding shouldered recesses, 4, in the lower ends of the sections above, the joints formed by the shoulders being ground and fitted so as to be steam-tight. The upper and lower sections are formed with shouldered recesses 5 in their ends, and shouldered plugs 6 are inserted into the ends, closing the same. A rod or hollow tube, 7, is secured with its lower screw-threaded end, 8, in a central perforation in the lower plug or head of the chamber, and the upper screw-threaded end, 9, of the rod or tube is fitted through a smooth perforation, 10, in the upper plug, and has a nut, 11, bearing against the plug and drawing the sections of the chamber together. The lowermost section is supported within the outer shell or casing above the furnace by means of radiating tubes 12, having their ends supported upon the walls 13 of the fire-place, and one of these radiating tubes is provided with the feed-pipe 14, while another of the tubes is provided with a blow-off cock, 15.

One end of a coiled pipe, 16, fits into an aperture or tapped perforation, 17, in the lowermost section, and the other end of this coil is extended outward and has an elbow-joint, 18, into which is secured a vertical pipe, 19, the upper end of which has an elbow-joint, 20, to which is secured a horizontal pipe, 21, radiating from the uppermost section of the chamber, a number of similar pipes radiating from the section, corresponding in number to the number of sections in the chamber. The other sections of the chamber have each a similar coil and vertical pipe and elbow-joints, all the vertical pipes having a connection with the upper section through the radiating horizontal pipes, and the live-steam pipe 22 enters the upper section and carries off the steam formed in the coils and conveyed through the vertical and radiating horizontal pipes into the upper section of the chamber.

It will be seen that by having the water circulating in the coils a comparatively-large heating-surface is acquired, so that the boiler will quickly create steam; and it will also be seen that the steam created and carried into the upper section of the chamber will be dry, as the upper ends and the elbows of the vertical pipes and the radiating horizontal pipes are above the water-level and carry the steam to apertures in the upper chamber considerably above the water-level.

When the boiler is to be put together, the lowermost section is first set up and the coil secured with the inner end in the same; another section is thereupon placed on the top of the lower section and the coil secured, and so forth, until the desired number of sections and coils have been built one upon the other, when the upper section is set up with its radiating pipes. The rod or tube which connects the sections of the chamber is thereupon inserted and the nut screwed down loosely, so as to hold the sections together, while at the same time allowing them to revolve one upon the other, and the vertical pipes are thereupon connected to the ends of the radiating horizontal pipes, each section and its coil being revolved so as to bring the vertical pipe to register with the end of the radiating horizontal pipe. When, now, all connections have been made, the nut is screwed home and the sections secured together, the joints being

drawn sufficiently tight upon each other to be perfectly steam-tight.

The furnace and the fire-chamber and shell for the boiler may be of any desired shape and construction, the boiler being capable of being placed into any fire-place which may support the radiating pipes of the lower section, and which can surround the boiler.

It will be seen that the boiler may be provided with any desired number of sections and coils, the generating capacity of the boiler increasing with the number of sections placed one above the other.

Having thus described my invention, I claim and desire to secure by Letters Patent of the Unitd States—

1. In a steam-boiler, the combination of a central chamber, a number of coiled pipes having their inner ends secured one above the other in the chamber, and having vertical pipes at their outer ends, and a number of radiating horizontal pipes in the upper end of the chamber, having the upper ends of the vertical pipes connected to their outer ends, as and for the purpose shown and set forth.

2. In a steam-boiler, the combination of a cylindrical section having a shouldered recess in its lower end and a reduced shouldered upper end, and having a number of radiating supporting-pipes closed at their outer ends, and having a feed-pipe and a blow-off cock upon two of the said pipes, a number of similarly-constructed sections having each one aperture or perforation and fitting one upon the other, an upper section having shouldered recesses in both ends, and having radiating pipes in its upper portion, a plug or head fitting in the lower end of the lowermost section, a similar plug fitting in the uppermost section, a rod or pipe secured in the lower plug and passing through the upper plug and having a nut upon that end, and coiled pipes having their inner ends secured in the perforations of the several sections, and having vertical pipes secured to their outer ends, connected at their upper ends to the outer ends of the radiating horizontal pipes, as and for the purpose shown and set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

WALTER H. BURDICK.

Witnesses:
JOHN SCHULZE,
CHARLES WICHERN.