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PATENTED DEC. 11, 1906.

S. O. LARKINS.
KILN HEATING APPARATUS.
APPLICATION FILED MAR. 30, 1906.

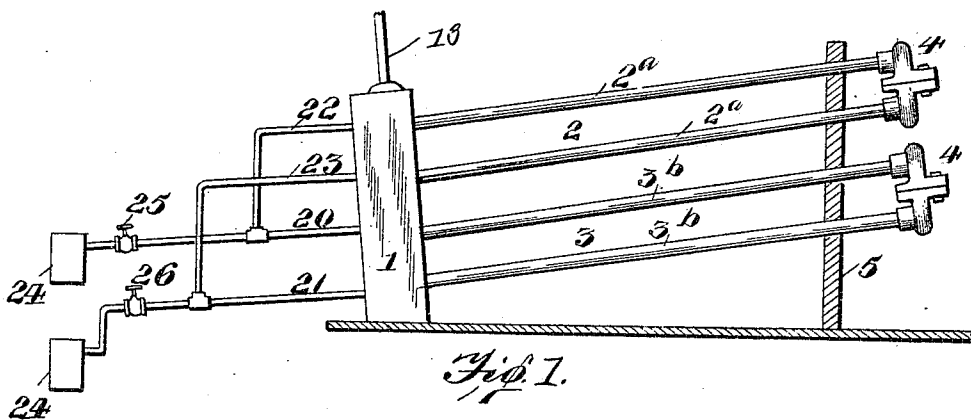
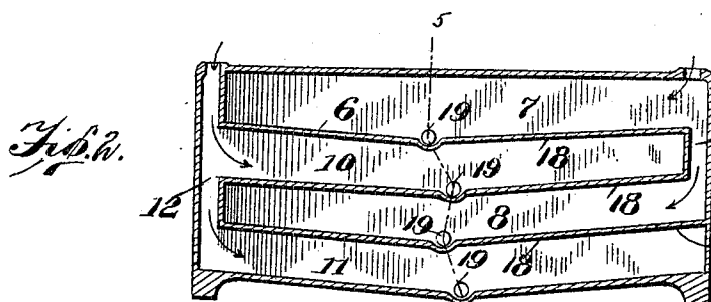
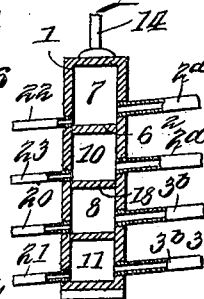
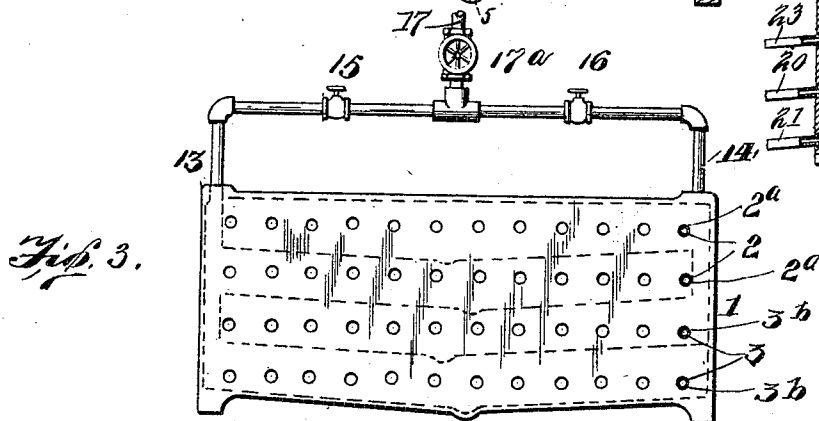
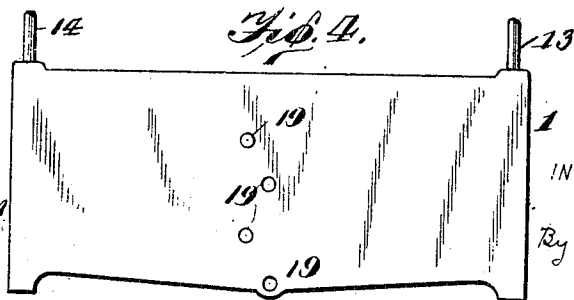


Fig. 5.



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KILN-HEATING APPARATUS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, SAMUEL O. LARKINS, a citizen of the United States, and a resident of Roland Park, in the county of Baltimore and State of Maryland, have invented a new and Improved Kiln-Heating Apparatus, of which the following is a specification.

My invention has to do with heating apparatus employed in lumber kilns or houses, and has for its object peculiar, novel, and improved apparatus of the character stated using steam as the heating medium.

The invention consists of the special construction shown by the accompanying drawings and hereinafter fully described, the features of novelty being pointed out in the appended claims.

In the drawings, Figure 1 is a detail view of my kiln-heating apparatus, the same being shown in side elevation. Fig. 2 is a vertical longitudinal sectional view through the heating-apparatus header. Fig. 3 is a side elevation of the header viewed from its radiating-pipe side, and Fig. 4 is a similar view of the header viewed from its other side. Fig. 5 is a transverse vertical sectional view through the header, taken on line 5 5 of Fig. 2.

My improved heating apparatus is designed for arrangement in kilns or houses adapted for the reception of cars loaded with lumber to be dried. Kilns or houses of the general character stated are well understood, and need not, therefore, be further referred to for a full understanding of my invention.

In the practice of my invention I employ a header 1, into which steam is conveyed, as will appear further on.

2 and 3 designate, respectively, upper and lower series of pipes or return-circulation radiating-tubes extending from the header 1, the same consisting of pipes 2^a and 3^b in the respective series, connected at their far ends from the header 1 by couplings 4, substantially as shown by Fig. 1. The several series of radiating-tubes 2 3 are arranged at an upward inclination from their connection with the header 1 and are provided with any suitable support 5 at their coupled end 4, as will be understood upon reference to Fig. 1 of my drawings.

Referring now to Fig. 2, it will be noticed that the header 1 is constructed with a serpentine transverse partition-wall 6, dividing the interior of the header into chambers 7 8, made communicating through a passage-way

9, and like chambers 10 11, made communicating through a passage-way 12. 13 denotes a pipe adapted to lead into the passage-way 12, and 14 denotes a similar pipe adapted to lead into the passage-way 9. The pipes 13 14 are provided with cut-off valves 15 16 and made communicating with a common supply-pipe 17. The latter pipe is designed to extend to any suitable steam-generator, obvious and not necessary to illustrate, and is provided with a cut-off valve 17^a.

According to my invention the upper pipe 2^a in each loop of the series 2 thereof is made communicating with the header-chamber 7, and the lower pipe 2^a is made communicating with the header-chamber 10. The upper and lower pipes 3^b of the series of loops 3 are arranged communicating with the respective header-chambers 8 11, substantially as the pipes 2^a communicate with the chambers 7 10.

It will be noticed (see Fig. 4) that the portions 18 of the partition-wall 6 extending longitudinally of the header are made inclining to common openings 19 through one vertical side of the header.

20 denotes a drain-pipe leading from the opening 19 in the chamber 8, and 21 a similar pipe leading from the opening 19 in the chamber 11.

22 denotes a branch pipe extending from the pipe 20 and leading into the chamber 7 through its opening 19, and 23 a similar pipe extending from the pipe 21 and leading into the chamber 10 through its opening 19. It is designed to extend the pipes 20 21 to any suitable hot-wells or condensers 24 and provide them with cut-off valves 25 26, as shown by Fig. 3.

The construction of my improved heating apparatus will be understood from the above description and its use rendered apparent by the following statement. In the use of my heating apparatus the valves 25 and 26 are closed, and the valve 17^a in the steam-supply pipe 17 is opened. Now it is apparent that unless air contained in the header-chambers 7, 8, 10, and 11 and the series of radiating-loops 2 3 is exhausted best results are not likely to be had from all portions of the heating apparatus, owing to imperfect circulation of the steam, due to formation of air-traps, all as well understood.

In the use of my improved heating apparatus all the valves should be closed when starting operation. Upon opening the valve

17^a, 15, and 16 steam is free to flow through the pipe 14 into the chambers 7 and 8, and it is also free to flow simultaneously through the pipe 13 into the chambers 10 and 11. 5 Steam in said chambers obviously is free to flow therefrom to the respective drain-pipes 20, 21, 22, and 23. In order that the whole apparatus shall be free to be filled with high-pressure steam, the valves 25 and 26 are 10 opened as occasion requires to drain off water of condensation and any air that may be trapped in the several header-chambers.

My heating apparatus is peculiar and novel in that the series of radiating-loops 2 3 are 15 arranged adapted for complete drainage of all condensation - water, and by reason of their peculiar pipe connections 2^a and 3^b with the respective steam-chambers 7 8 and 10 11 of the header 1 when steam is turned 20 on through the pipe 17 the whole heating apparatus will be filled with high-pressure steam, substantially as in the dome of a steam-boiler.

I claim—

25 1. A heating apparatus comprising a header constructed with inner division-walls forming separated series of vertically-arranged communicating chambers, the chambers of one series being located between similar 30 chambers of a separate series, drain-pipes with cut-off valves leading from the several chambers in the header, steam-conveying

pipes leading into the respective series of header-chambers, cut-off valves in said steam-conveying pipes, and heater-pipes providing 35 communication for a chamber in one series thereof into a lower chamber of a separate series of chambers, the heater-pipes being arranged upwardly inclining from their connection with the header. 40

2. A heating apparatus comprising a header constructed with inner division-walls forming separated series of vertically-arranged communicating chambers, the chambers of 45 one series being located between similar chambers of a separate series, drain-pipes with cut-off valves leading from the several chambers in the header, the chambers being constructed with inner bottoms, made downwardly inclining to centrally-located discharge-openings, providing passage-ways into 50 the drain-pipes, steam-conveying pipes leading into the respective series of header-chambers, cut-off valves in said steam-conveying pipes, and heater-pipes providing open communication from a chamber in one series 55 thereof to a lower chamber in a separate series of chambers, the heater-pipes being arranged upwardly inclining from their connection with the header.

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Witnesses:

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