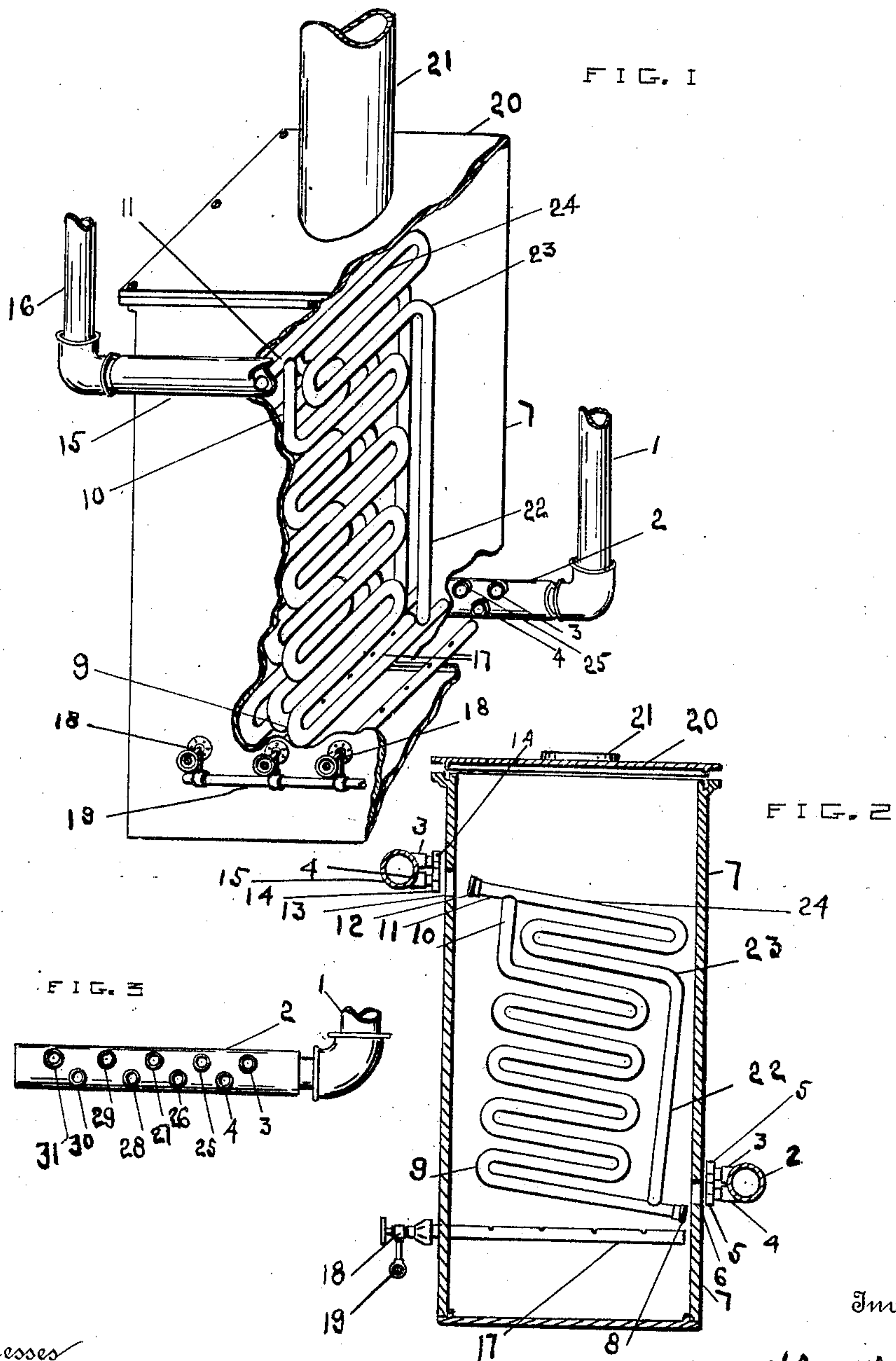


A. H. MERRILL.
COIL HEATER.
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990,763.

Patented Apr. 25, 1911.



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ALFRED H. MERRILL, OF TOLEDO, OHIO.

COIL-HEATER.

990,763.

Specification of Letters Patent.

Patented Apr. 25, 1911.

Application filed November 7, 1910. Serial No. 590,961.

To all whom it may concern:

Be it known that I, ALFRED H. MERRILL, a citizen of the United States, residing at Toledo, Lucas county, Ohio, have invented
5 a new and useful Coil-Heater, of which the following is a specification.

This invention relates to a water tube heating structure.

This invention has utility when embodied
10 in a hot water heater such as for instantaneous heating, domestic use or radiator system.

Referring to the drawings: Figure 1 is a perspective view with parts broken away showing an embodiment of the invention
15 adapted to a water heater; Fig. 2 is a section thereof showing position for removal of parts; and Fig. 3 is a detail of one of the manifolds.

The down or return line 1 is connected to
20 the manifold 2 which has opening 3 near the upper side thereof, and opening 4 near the lower side thereof. These manifold openings are provided with union elements
5 adjacent opening 6 in the heater housing
25 7 through which opposing elements 8 of the connecting means may serve to unite the coil having section 9 in communication by line
10 with the discharge pipe 11 having union connecting element 12 movable to protrude
30 through housing opening 13 and thereby enter into mounting relation with the opposing union element 14 carried by the riser manifold 15 having similar structure to the return manifold 2. This manifold 15 is
35 connected to the riser line 16 which may extend to a radiator heating system having the return line 1.

Placed in the lower part of the housing
7 is a burner 17 shown as of gas type hav-
40 ing control valve 18 from the gas supply line 19. The housing 7 has removable top 20 through which the exhaust flue passage 21 may be in communication with the stack or chimney.

45 In the same plane as the riser coil section 9 is riser 22 to the coil 23 in the housing 7. This coil 23 is remote from the burner 17 and adjacent the flue 21. The coil 23 has line 24 in communication with line 11 into
50 which coil 9 discharges. These coils 9 and 23 are in a common plane and are riser coils. The former, being adjacent the burner, may be considered the primary or main heating coil to be normally operable
55 while the coil section 23 may be considered secondary and effective to abstract from the

products of combustion such remaining heat as may exist and supply its heated water to the riser manifold 15 at such rate relative to the circulation through coil 9 as the
60 relative areas of the coils and the heating produced may develop. Considerable advantage accrues from this coil structure in that extension of coil 9 say to the limit occupied by coil section 23 might result in a
65 heating of the flue gases by radiation from the coil at this remote point from the burner. Such direct heat loss might be avoided by this branching of the coil and placing them selectively in parallel. The coil itself may
70 be compactly and economically shaped up from tubing with say electric welds to unite the branched coils. The building of the coil in a common plane as to sections 9 and 23 renders it compact and units may be built
75 up in parallel to such extent as may be found necessary. In the instance shown herein, the coils are shown in three groups of three each, the grouping being as shown
80 in Fig. 3 with the coils connected to the openings in the manifold 3, 4, 25, 26, 27, 28, 29, 30 and 31.

Instead of firepot structure or general extent burner, there is shown in this instance a burner separately controlled for
85 each set of three of the coils. This will permit of running the heater at any reduced rate desired.

A feature of considerable importance in practice has to do with the setting up as
90 well as taking down of the coils which may become defective from use or misuse. This disconnecting may be readily and simply accomplished in this device by merely disconnecting the unions 14 and 5 from the coil
95 it is desired to remove and rocking the coil in the housing so that the union elements 8 and 12 are free of the openings 6 and 13. When so released from the housing, as
100 shown in Fig. 2 with the top ready for removal as also shown in this figure, the coil may be drawn upward, the ends plugged, or a substitute coil installed. Staggering the coils permits of more easy access to the
105 unions.

What is claimed and it is desired to secure by Letters Patent is:

1. The combination of a heater having a housing, a pair of manifolds exterior of said housing, and an upward flow coil in the
110 housing and protruding therefrom to connect said manifolds, the portion of the coil

within the housing being branched to form two flow lines between the manifolds.

2. The combination in a heater having a combustion chamber of a pair of manifolds exterior of said chamber, adjacent parallel manifold connecting coils each having a branch separating therefrom and joining thereto within said chamber, each branch and its coil lying in a common plane.

10 3. The combination in a heater having a housing, a burner in said housing, and a plurality of adjacent similar continuous flow

coils disposed above said burner; said coils each having a branch separating therefrom and joined thereto within said housing, the branch from each coil lying in a common plane with said coil. 15

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

ALFRED H. MERRILL.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
