A. O'LOUGHLIN.

HOT AIR FURNACE.

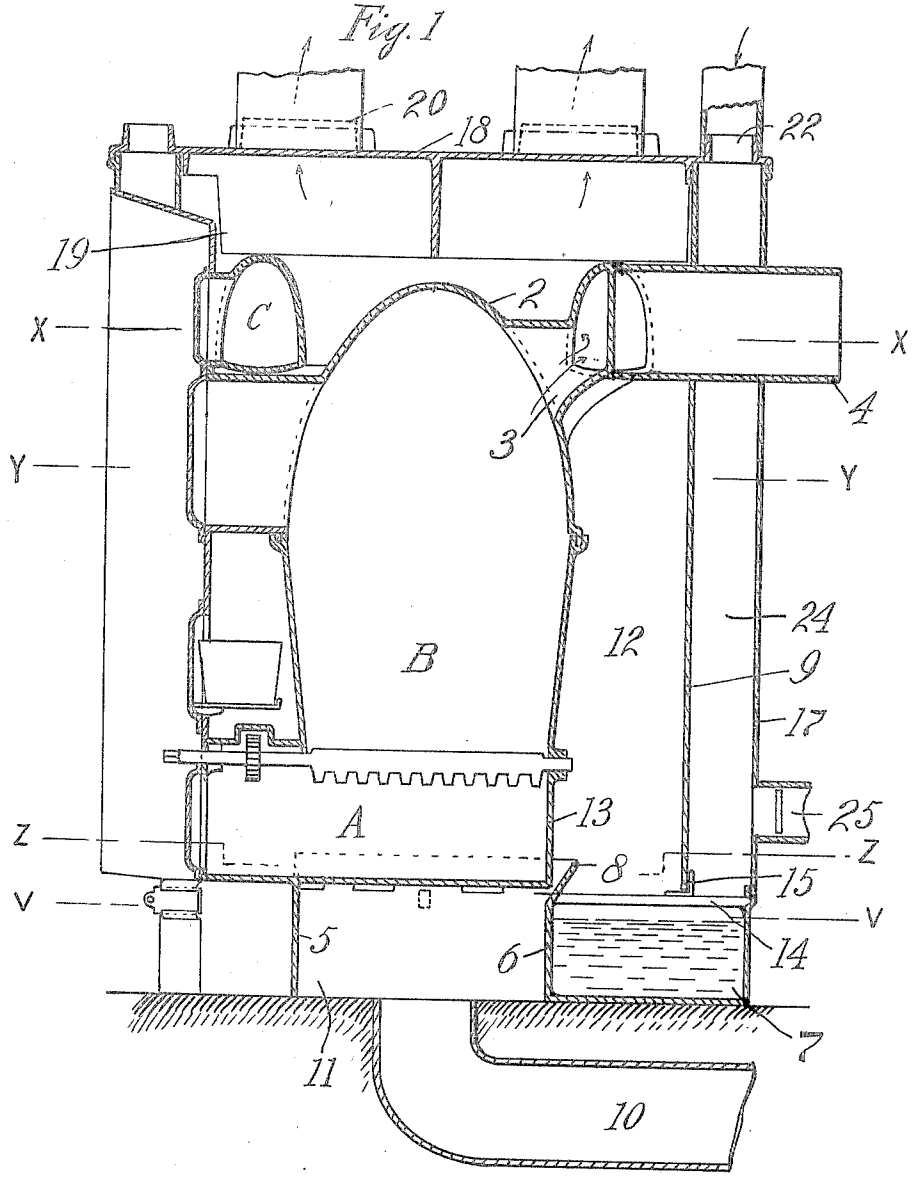
APPLICATION FILED AUG. 29, 1908

1,108,388.

Patented Aug. 25, 1914.

3 SHEETS—SHEET 1.

Fig. 1



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3 SHEETS—SHEET 2.

Fig. 2

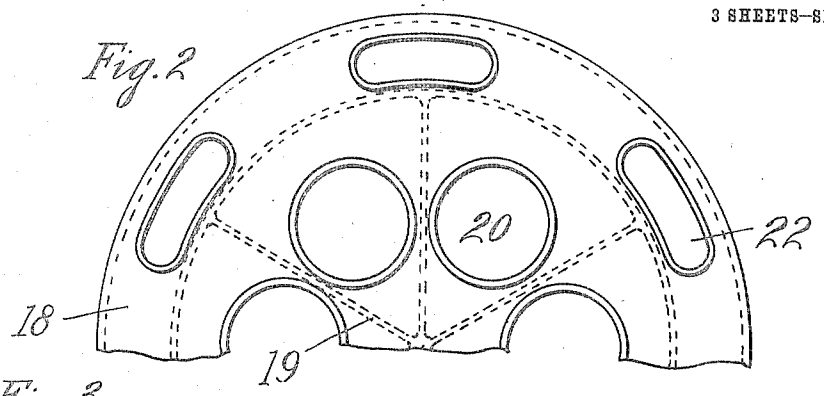


Fig. 3

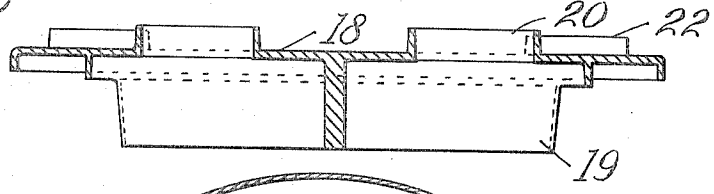


Fig. 4

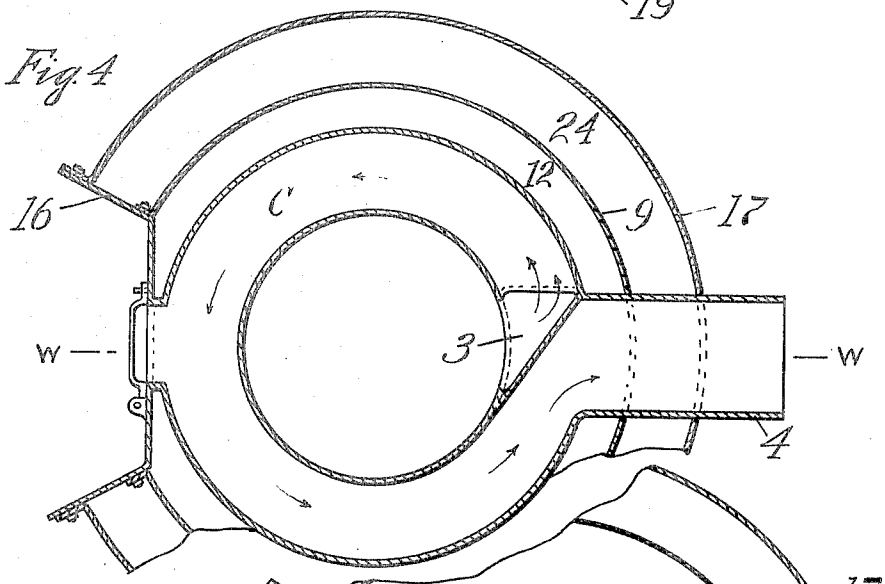
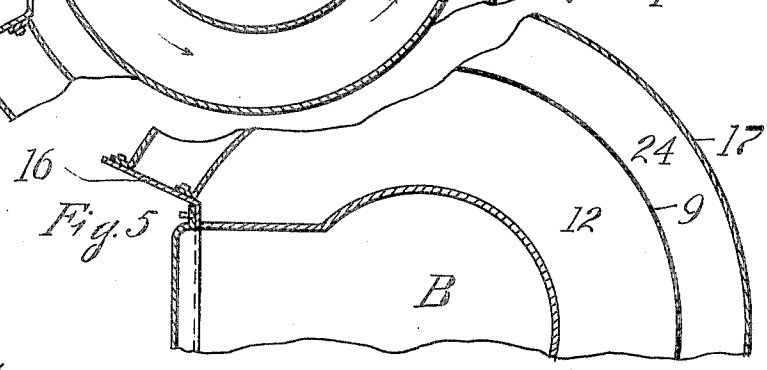


Fig. 5



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3 SHEETS—SHEET 3.

Fig. 6

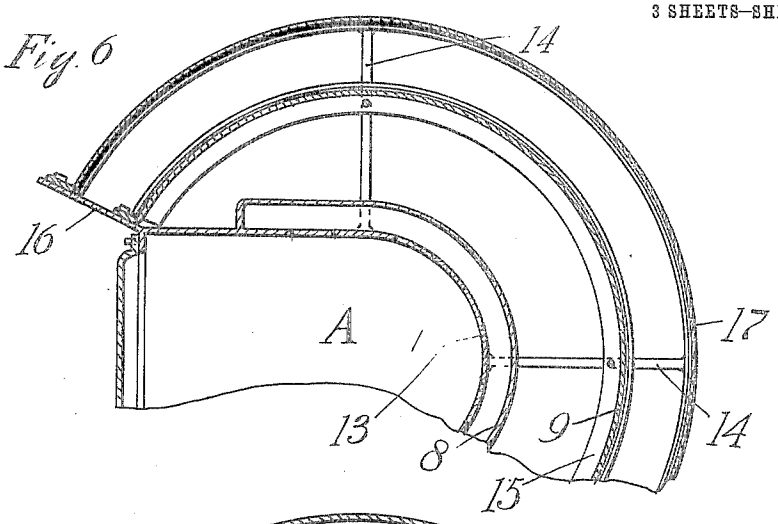


Fig. 7

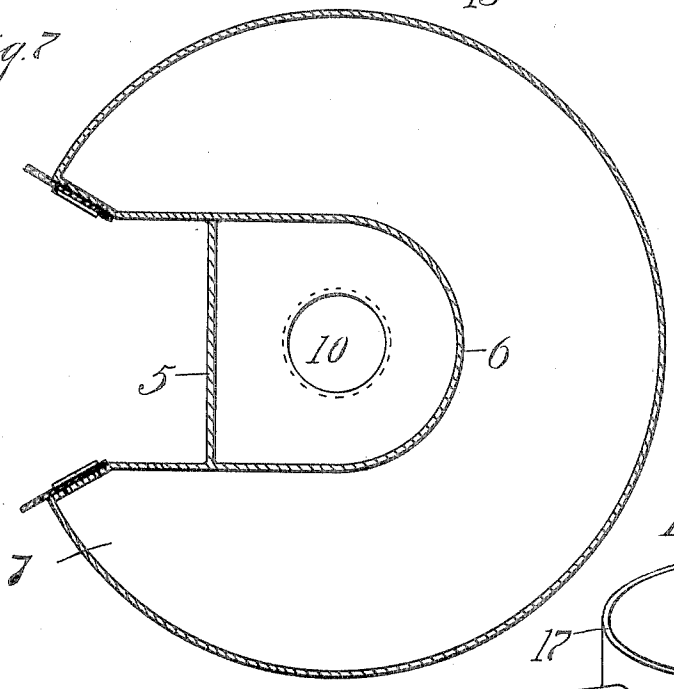
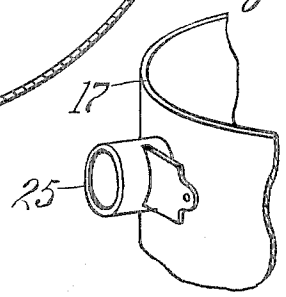


Fig. 8



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UNITED STATES PATENT OFFICE.

ALLAN O'LOUGHLIN, OF ST. PAUL, MINNESOTA.

HOT-AIR FURNACE.

1,108,388. Specification of Letters Patent. **Patented Aug. 25, 1914.**

Application filed August 29, 1908. Serial No. 450,844.

To all whom it may concern:

Be it known that I, ALLAN O'LOUGHLIN, a subject of the King of Great Britain and Ireland, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Hot-Air Furnaces, of which the following is a specification.

My invention relates to improvements in hot air heating furnaces, its object being to provide a furnace by which the air from the rooms may be readily purified, heated and returned to the room.

To this end my invention consists in the features of construction, combination and arrangement of parts hereinafter particularly described and claimed.

In the accompanying drawings forming part of this specification, Figure 1 is a vertical section through the middle of the furnace on line *w—w* of Fig. 4, Fig. 2 is a top view partly broken away, Fig. 3 is a vertical section through the cap, Fig. 4 is a fragmental horizontal section on line *x—x* of Fig. 1, Fig. 5 is a fragmental horizontal section on line *y—y* of Fig. 1, Fig. 6 is a fragmental horizontal section on line *z—z* of Fig. 1, Fig. 7 is a horizontal section on line *v—v* of Fig. 1, and Fig. 8 is a detail of the exhaust air pipe.

In the drawings A represents the ash pit, B the fire box or pot and C the smoke travel of the furnace. The smoke travel is supported upon the dome 2 and runs circularly around it. It communicates with the combustion chamber through a passage 3, and has a smoke arm 4 through which the smoke is discharged into the chimney.

The ash pit is supported above the bottom of the furnace structure by walls 5 and 6. The wall 6 constitutes the inner wall of the water receptacle 7 which extends around on three sides of the furnace as shown in Fig. 7. The wall 6 is formed at the top with an outwardly flared flange 8 which extends up beyond the bottom of the ash pit in order to carry and direct the current of air which enters the chamber 11 through the inlet pipe 10 up above the top of the water receptacle and above the lower end of the partition wall 9 as hereinafter pointed out. The side wall 6 is formed near its point of union with the flange 8 with openings through which the air passes up between the flange and wall 13 of the ash pit into the flue or chamber 12. The openings between the flange 8 and the wall 13 of the ash pit, as shown in Fig. 1, thus constitute ports leading from below the ash pit to the chamber 12.

The receptacle 7 is formed at its top with cross bars 14 upon which is supported a curved strip 15 forming a support for the lower end of the partition wall 9. The partition wall 9 is interspaced from the fire box and combustion chamber to constitute the intermediate chamber 12 and is secured at its front to the outwardly flaring side walls of the front casting 16 of the furnace. Also secured to the front casting 16 is the outer shell 17 of the furnace. This is secured to or rests upon the top of the outer wall of the receptacle 7 and is interspaced from the partition wall 9 to constitute an intermediate chamber or flue 24.

The cap 18 of the furnace fits over and rests upon the outer shell 17 and the partition 9 as shown in Fig. 1. The cap carries on its underside a number of radial partitions 19 which extend downwardly to rest upon the smoke travel C. Thus the hot air chamber above the dome is divided by these radial partitions into a plurality of separate chambers or passages. Above each chamber the cap is formed with an outlet port 20 from which a pipe may lead to the room to be heated. The top of the cap is also formed with a plurality of ports 22 which communicate with the chamber 24 between the walls 9 and 17.

In use the fresh air enters through the pipe 10 and passes thence through the chamber 11 and into the chamber 12 between the wall 13 of the fire-pot and the partition 9. It becomes heated by reason of its contact with, and proximity to, the side wall of the fire-pot, and passes up around the smoke travel into one of the segmental chambers of the cap, and thence through outlet port 20. After it has done its work and lost part of its heat, it passes from the room down through the return port 22 into the chamber 24 between the partition 9 and the outer shell 17 of the furnace. Being colder than the air in the chamber 12, it will pass to the bottom of the chamber or flue 24, and around under the bottom of the partition 9 and up into the chamber 12 where it mingles with the freshly entering air and ascends again to the rooms to be heated. In passing under the partition 9, it is brought into contact with the water in the receptacle. This removes the dust and moistens the air. The

old air may be drawn from the rooms and furnace through a dampered pipe 25 leading from the chamber 24 into the outside air.

I claim:

1. A furnace comprising a fire pot, an inner shell outside the fire pot and spaced apart therefrom to form a hot air chamber, an outer shell extending around the inner shell and spaced apart therefrom to form a return chamber for the air, the hot air chamber having an inlet port near the bottom for the entrance of fresh air and an outlet at the top for the discharge of heated air to the rooms to be heated, and the return chamber having an inlet port at the top for the return of air from the rooms, and a water receptacle extending around under, the bottoms of both of said chambers, the wall constituting the inner shell terminating short of the top of the water receptacle so as to permit the returning air in the outer chamber to pass between the lower end of the shell and the top of the receptacle to the hot-air chamber.

2. A furnace comprising a fire box, interspaced concentric walls around the fire box forming inner and outer chambers, said chambers communicating at their lower ends and the inner chamber having an opening near the bottom and on the side adjacent to the fire pot for the entrance of air to be heated and the outer chamber having an inlet opening at the top for the return of air, a water receptacle below the lower ends of said chambers and in communication therewith, and a cap fitting over the top of the inner chamber, said cap being formed on its underside with a plurality of separated passages and with an outlet port leading from each of said passages and adapted to receive a pipe.

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

ALLAN O'LOUGHLIN.

Witnesses:
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ARTHUR P. LOTHROP.