

T. P. SHARTS.
ELECTRIC FURNACE CONDENSER.
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1,044,087.

Patented Nov. 12, 1912.

Fig. 1.

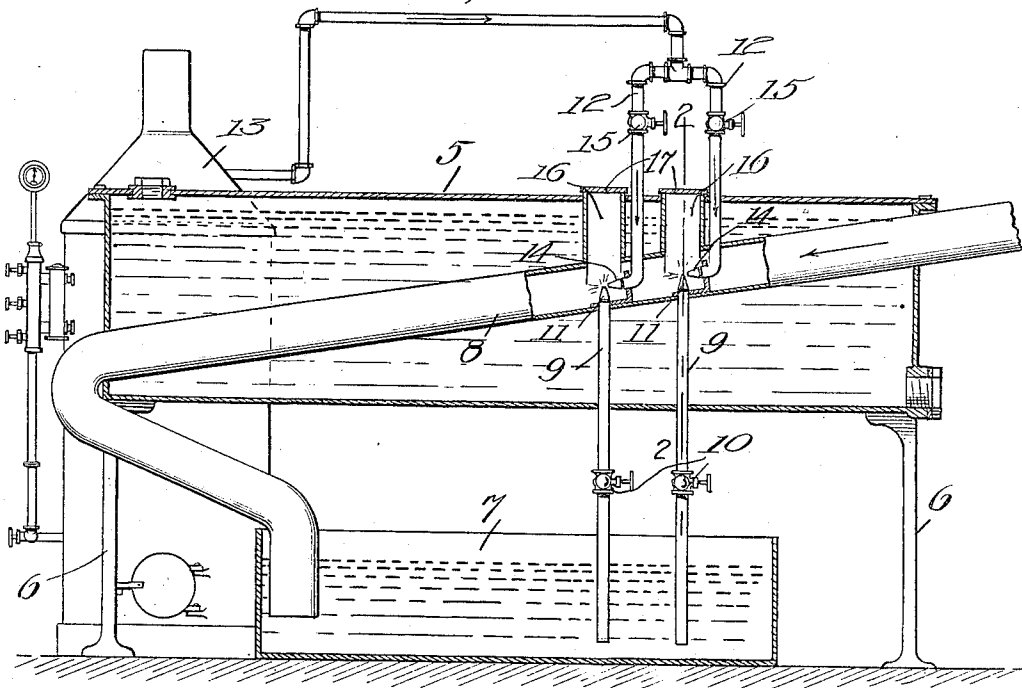
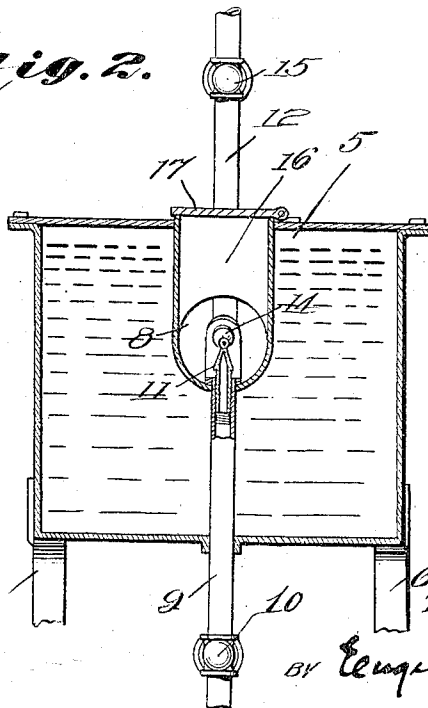


Fig. 2.



WITNESSES

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ELECTRIC-FURNACE CONDENSER.

1,044,087.

Specification of Letters Patent.

Patented Nov. 12, 1912.

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To all whom it may concern:

Be it known that I, TRUEMAN P. SHARTS, a citizen of the United States, residing at North Adams, in the county of Berkshire and State of Massachusetts, have invented certain new and useful Improvements in Electric-Furnace Condensers, of which the following is a specification.

The apparatus which is the subject of the present invention is designed more particularly for condensing the volatilized products of an electric furnace, and its object is to provide a condenser which is highly efficient and rapid in operation; and with this object in view, the invention consists in a novel combination and arrangement of parts to be hereinafter described and claimed.

In order that the invention may be better understood, reference is had to the accompanying drawing, in which—

Figure 1 is a longitudinal sectional view of the apparatus, and Fig. 2 is an enlarged cross-section on the line 2—2 of Fig. 1.

Referring specifically to the drawing, 5 denotes an elongated closed casing mounted on legs or other suitable supports 6. Below this casing is located a tank or similar receptacle 7 which is open at the top. Extending lengthwise through the casing 5, from one end to the other, is a pipe 8 which enters the casing through one of the end walls thereof, and passes out of the same through the other end wall. The pipe enters near the top of the casing and leaves the casing near the bottom, and it is therefore inclined. The lower end of the pipe is continued outside the casing and carried to the tank 7 into which it discharges. The other end of the pipe leads from an electric furnace or other apparatus in which the vapors to be condensed originate. As this apparatus forms no part of the present invention, it has not been illustrated.

Into that part of the pipe 8 which passes through the casing 5 extend pipes 9, which pass through the bottom of the casing and extend down into the tank 7, the purpose of said pipes being to discharge the contents of the tank into the pipe 8, as will be presently described. The pipes are provided with suitable controlling valves 10, and to their ends which extend into the pipe 8 are fitted nozzles 11. Into the pipe 8 also extend steam pipes 12 which are connected to

13. The ends of the steam pipes which are in the pipe 8 are fitted with nozzles 14 which are arranged to discharge toward the lower end of the pipe 8 and past the mouth of the nozzles 11. An atomizing action is therefore produced and the contents of the tank 7 are drawn through the pipes 9 and sprayed from the nozzles 11 into the pipe 8. The steam pipes are provided with suitable valves 15 to control the flow of the atomizing fluid.

In order that access to the nozzles 11 and 14 may be readily had, flues 16 are provided which open at one of their ends into the pipe 8 opposite the mouth of the nozzles, and at their other ends through the top of the casing 5, the last-mentioned ends being provided with suitable closures 17.

The casing 5 will contain a sufficient supply of water in which the pipe 8 is submerged, and the tank 7 also contains water, the pipe 8 discharging below the level thereof.

The operation of the apparatus is as follows: The vapors from the furnace pass through the pipe 8 into the tank 7. The jets of steam which are discharged past the mouth of the nozzles 11 create a vacuum in the pipes 9 which causes the water of the tank 7 to be discharged into the pipe 8 from the nozzles 11 in the form of a fine spray, the action being similar to that of an atomizer. This water mixes with the steam and the vapors to be condensed and all three are discharged into the tank 7, the steam being quickly condensed by water issuing from the nozzles 11. Suction is also produced in the pipe 8 and the vapors are drawn from the furnace as fast as they are formed. The condensing action is also aided by the water jacket which surrounds the pipe 8. The steam discharged into the pipe 8 also acts as a blower to force out the condensed vapor. The steam and water nozzles are adjustable and changeable to suit the character of the vapors to be condensed.

It will be seen from the foregoing that a constant circulation of water from the tank 7 into the pipe 8 and back into the tank is maintained, which, together with the mixing of the water and steam with the vapors rapidly produces condensation of the latter. The precipitates collect in the bottom of the tank from which they are removed when a sufficient quantity has collected.

The preferred embodiment of the invention has been shown, but it will be evident that various minor changes in the structure may be made without departing from the spirit and scope of the invention. Two atomizing nozzles are shown, but their number is immaterial.

I claim:

1. A condenser comprising a closed casing containing a cooling medium, a vapor-conducting pipe passing through the casing, a receptacle outside the casing into which receptacle the aforesaid pipe discharges, an atomizer pipe having its inlet in the receptacle and its outlet in that portion of the vapor-conducting pipe which passes through the aforesaid casing, and means for discharging an atomizing fluid past the mouth of the atomizer pipe.

2. A condenser comprising a closed casing containing a cooling medium, a vapor-conducting pipe passing through the casing, a receptacle outside the casing into which receptacle the aforesaid pipe discharges, an atomizer pipe having its inlet in the receptacle and its outlet in that portion of the vapor-conducting pipe which passes through the aforesaid casing, a source of steam supply, and means for discharging steam past the mouth of the atomizer pipe.

3. A condenser comprising a closed casing containing a cooling medium, a vapor-con-

ducting pipe passing through the casing, a receptacle outside the casing into which receptacle the aforesaid pipe discharges, an atomizer pipe having its inlet in the receptacle and its outlet in that portion of the vapor-conducting pipe which passes through the aforesaid casing, means for discharging an atomizing fluid past the mouth of the atomizer pipe, a flue extending from the vapor-conducting pipe and opening through the wall of the casing, said flue being in line with the mouth of the atomizer pipe, and a closure for the flue.

4. A condenser comprising a closed casing containing a cooling medium, a vapor-conducting pipe entering said casing at one end near the top and passing out of the casing at the opposite end near the bottom, a receptacle outside the casing into which receptacle the aforesaid pipe discharges, an atomizer pipe having its inlet in the receptacle and its outlet in that portion of the vapor-conducting pipe which passes through the aforesaid casing, and means for discharging an atomizing fluid past the mouth of the atomizer pipe.

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

TRUEMAN P. SHARTS.

Witnesses:

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