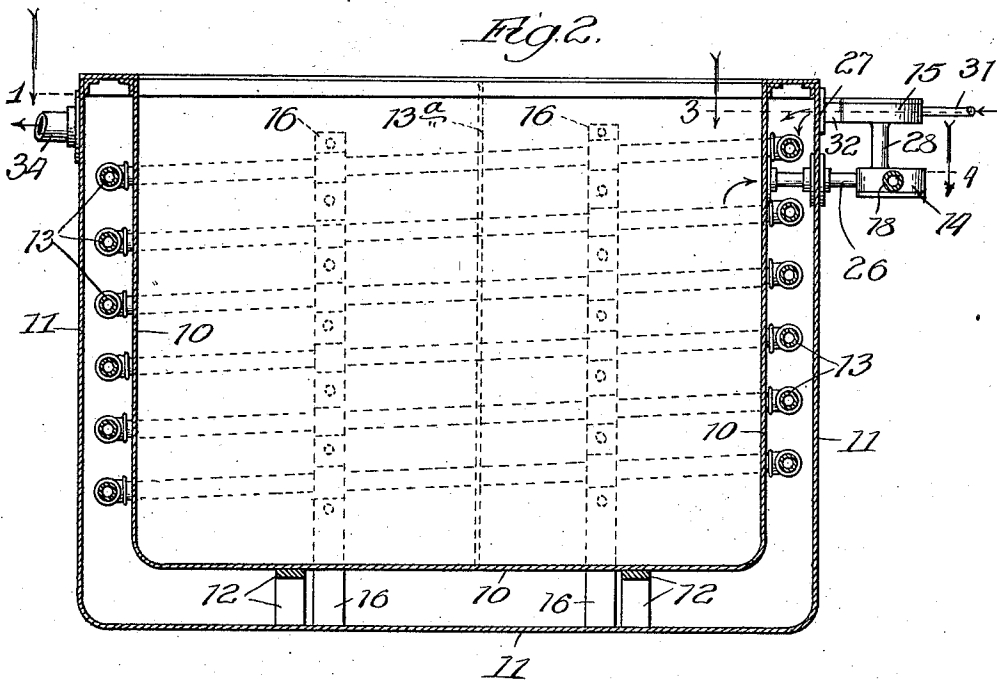
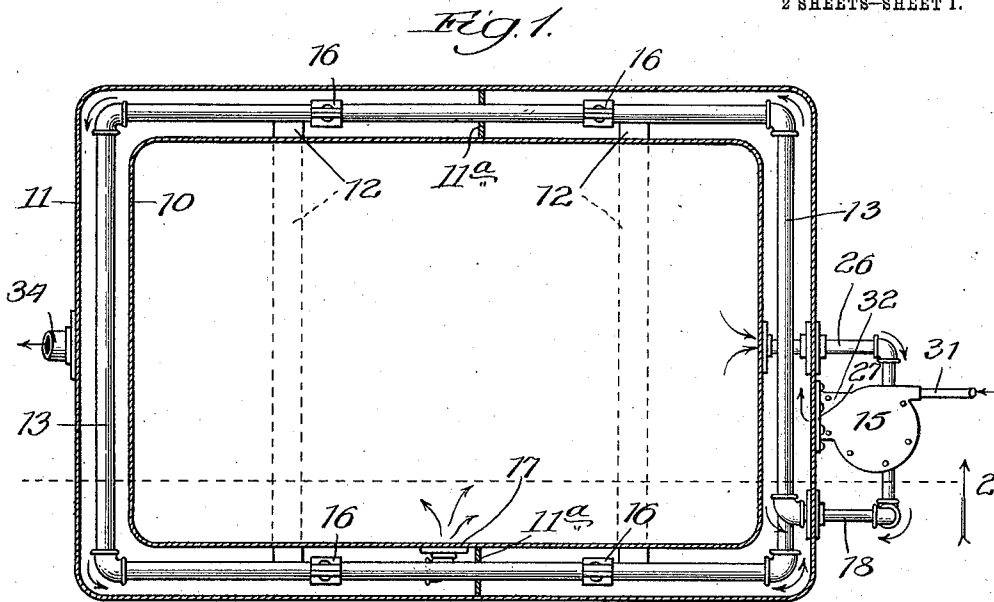


W. G. LUNGER.
COOLING TANK.
APPLICATION FILED FEB. 8, 1912.

1,066,128.

Patented July 1, 1913.

2 SHEETS—SHEET 1.



Witnesses:
E. J. Gaylord.
J. F. Chasov.

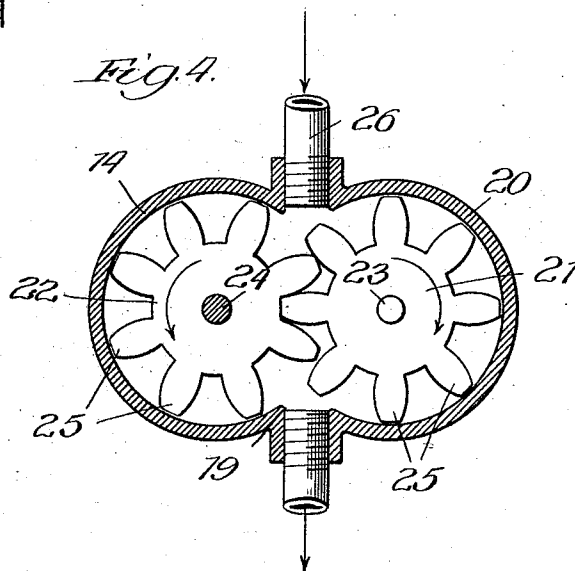
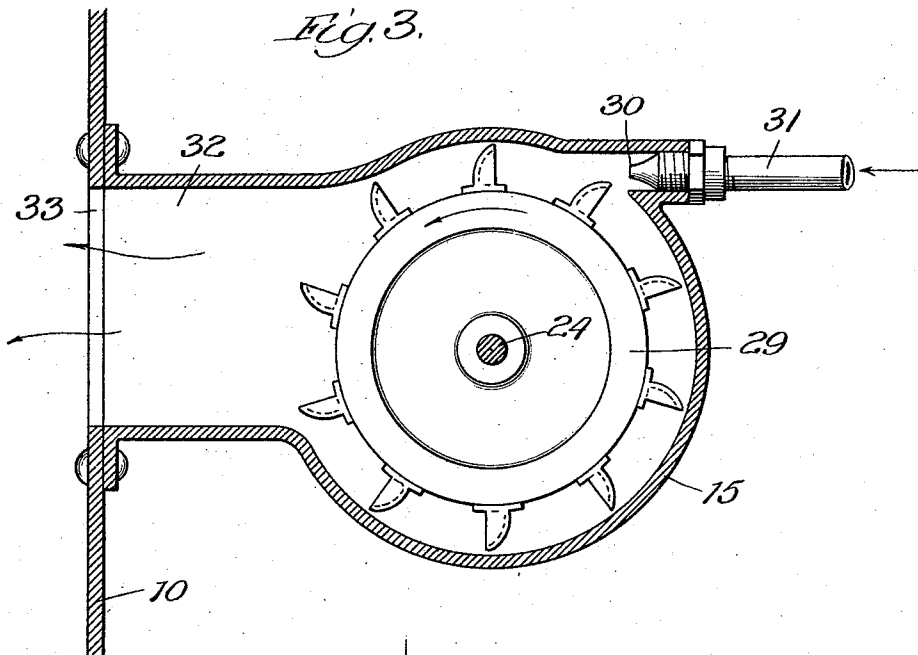
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2 SHEETS—SHEET 2.



Witnesses.
E. C. Gaylord.
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UNITED STATES PATENT OFFICE.

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COOLING-TANK.

1,066,128.

Specification of Letters Patent.

Patented July 1, 1913.

Application filed February 8, 1912. Serial No. 676,421.

To all whom it may concern:

Be it known that I, WALDO G. LUNGER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Cooling-Tanks, of which the following is a specification.

In the manufacture of certain articles of steel or alloys thereof, it is necessary that they be treated to heat and in heated condition quenched in a fluid bath, as for example of oil or brine, at, or approximately at, a certain temperature, to refine the metal, or to temper or harden it, all as is well understood in the art of heat treating steel, my invention relating to cooling-tanks devised, more particularly, for the above stated purpose.

My object is to provide a construction of apparatus for the purpose above stated which may be manufactured and installed, together with its operating mechanism, at relatively low cost, and be economically operated.

Referring to the accompanying drawings—Figure 1 is a plan view of a cooling apparatus constructed in accordance with my invention. Fig. 2 is a section taken at the line 2 on Fig. 1 and viewed in the direction of the arrow; and Figs. 3 and 4, enlarged plan sectional views of the water-motor and pump illustrated, these sections being taken at the lines 3 and 4 on Fig. 2 and viewed in the direction of the arrow.

In the accompanying drawings I have illustrated what I consider to be the preferred embodiment of my invention, the apparatus therein disclosed comprising an inner receptacle 10 open at its top and supported in a receptacle 11, with its sides and bottom spaced from the latter, the receptacle 10 being supported in said position on cross-pieces 12 in the receptacle 11; a coil 13 located in the receptacle 11 and surrounding the receptacle 10 and connected with a pump 14 for circulating the oil, or other fluid used, through the receptacle 10 and coil 13; and a water-motor 15 operatively connected with the pump 14 for actuating the latter and adapted to discharge therefrom the spent water into the chamber between the receptacles 10 and 11.

The receptacle 10 is provided for the purpose of receiving the oil or other fluid into which the heated metal articles to be cooled

are to be immersed, the fluid commonly employed as the immersing bath being oil or brine. The coil 13, which is supported at intervals on standards 16 in the receptacle 11, opens at its lower end, indicated at 17, into the lower end of the receptacle 10 to communicate with the interior of the latter, the upper end of the coil extending through a wall of the receptacle 11 and connecting with a pipe 18 which opens into the outlet 19 of the pump 14. In carrying out my invention, the pump 14 may be of any suitable construction, that disclosed being of a well-known type and comprising a casing 20 containing a pair of toothed rotary members 21 and 22 supported on shafts 23 and 24 respectively in the casing 20. The members 21 and 22 intermesh at their teeth 25 with each other, and are adapted, when they are rotated in the direction of the arrows, as hereinafter described, to cause the oil flowing into the casing 20, from the upper end of the receptacle 10 through a pipe 26, to be discharged through the pipe 18 into the coil 13 and forced through the latter into the receptacle 10 near the bottom of the latter.

The water-motor 15, which may be of any suitable construction, is secured at its casing 27 to a wall of the receptacle 11, and is provided with a depending sleeve 28 connected with the casing 20 of the pump 14. The rotary drive-member of the pump 15 is represented at 29 and is fixed on the upper end of the shaft 24 which extends upwardly through the sleeve 28 and is journaled in the casing 27 of the motor 15. Thus it will be understood that rotation of the member 29, as hereinafter described, will drive the members 21 and 22 of the pump. The inlet of the motor 15 is represented at 30 and is connected with a pipe 31 which leads to any suitable controllable source of water under pressure, this inlet being so arranged that the water upon entering the casing 27 of the motor 15 will drive the member 29 in the direction of the arrow in Fig. 3. The outlet for the spent water from the motor 15 is represented at 32 and communicates with an opening 33 in a wall of the receptacle 11, whereby the spent water is discharged into the latter.

The operation of the apparatus is as follows: The fluid in the receptacle 10 is circulated through the latter, and the coil 13, by

means of the pump 14 driven from the motor 15. The fluid in the coil 13 is subjected to the cooling action of the water which is supplied to the receptacle 11 from the discharge-end of the motor 15, the receptacle 15 being provided with an overflow 34, which is preferably located a slight distance below the opening 33, whereby back-pressure of water on the pump 15 is avoided. It will be understood that in the preferred arrangement illustrated, the water in the receptacle 11 is maintained at the desired temperature for cooling the fluid in the coil 13, by the discharge from the pump 15 into the receptacle 11 and a corresponding overflow from this receptacle, baffles 11^a therein serving to insure the complete circulation of the water in the receptacle 11. The subjection of the coil 13 to the cooling action of the water in this receptacle will cause the fluid circulated through this coil to be cooled, which thus permits the quenching bath in the receptacle 10 to be maintained at, or substantially at, a certain temperature.

The feature of employing a water-motor for actuating the pump which circulates the quenching fluid is of great importance in an apparatus of this character, as it permits of the economical operation thereof, in that the force of the water is utilized for driving the pump, and the spent water therefrom is used for cooling the circulating quenching fluid, thus causing the water to perform a double function. Furthermore, the apparatus may be installed and operated wherever water, under pressure, is available, as distinguished from the constructions hitherto employed which require for their operation, in addition to a water-supply for cooling the quenching fluid, some other form of power medium for driving the circulating pump. By the employment of a water-motor discharging the spent water therefrom into the receptacle 11, the degree to which the circulating quenching fluid is cooled may be controlled merely by varying the supply of water to the motor 15, it being understood that the greater the flow of water to the motor the faster the pump 14 is operated, and the faster the quenching fluid circulated, and consequently the lower the temperature of the water in the receptacle 11.

While I have illustrated and described a certain construction in which my invention is embodied, I do not wish to be understood as intending to limit my invention to the construction illustrated, as the same may be variously modified and altered without departing from the spirit of my invention as defined by the claims.

What I claim as new, and desire to secure by Letters Patent, is—

1. In apparatus of the character set forth, the combination of a receptacle for a quench-

ing fluid, means for circulating the quenching fluid, a water-motor adapted to be connected with a source of water-supply and operating to actuate said circulating means, and means for subjecting the circulating quenching fluid to the cooling action of the spent water discharged from said motor.

2. In apparatus of the character described, the combination of a receptacle for a quenching fluid, a conduit opening at its ends into said receptacle, means for circulating the quenching fluid through said conduit and said receptacle, a water-motor, adapted to be connected with a source of water-supply, operatively connected with said circulating means for actuating the latter, and means for subjecting the fluid in said conduit to the cooling action of the spent water discharged from said motor.

3. In apparatus of the character described, the combination of a receptacle for a quenching fluid, a conduit opening at its ends into said receptacle, a pump for circulating the quenching fluid through said conduit and receptacle, and a water-motor, adapted to be connected with a source of water-supply, operatively connected with said pump for driving the latter and discharging the spent water therefrom against said conduit for cooling the quenching fluid therein.

4. In apparatus of the character described, the combination of a receptacle for a quenching fluid, a conduit opening at its ends into said receptacle, a receptacle into which said conduit extends, a pump for circulating the quenching fluid through said conduit and said first-named receptacle, and a water-motor, adapted to be connected with a source of water-supply, operatively connected with said pump for driving the latter and discharging the spent water therefrom into said last-named receptacle.

5. In apparatus of the character described, the combination of a receptacle for a quenching fluid, a conduit opening at its ends into said receptacle, a receptacle into which said conduit extends provided with an overflow, a pump for circulating the quenching fluid through said conduit and said first-named receptacle, and a water-motor, adapted to be connected with a source of water-supply, operatively connected with said pump for driving the latter and having its discharge for the spent water communicating with said second-named receptacle above the overflow therein, for the purpose set forth.

6. In apparatus of the character described, the combination of an outer receptacle, an inner receptacle for a quenching fluid located within and having its walls spaced from the walls of said outer receptacle, a conduit extending into the space between said receptacles and opening at its

opposite ends into said inner receptacle toward the upper and lower ends thereof, a pump for circulating the quenching fluid through said inner receptacle and said conduit, and a water-motor, adapted to be connected with a source of water-supply, operatively connected with said pump for driving the latter, and discharging the spent water therefrom into the space between said receptacles for cooling the quenching fluid in said conduit.

7. In a cooling-tank, the combination of an outer receptacle provided near its upper end with an overflow, an inner receptacle for a quenching fluid located within, and having its walls spaced from, the walls of said outer receptacle, a pipe-coil surrounding said inner receptacle and located within

the space between the latter and said outer receptacle, said coil opening at its lower end into the interior of said inner receptacle and at its upper end opening into the upper end of said inner receptacle, a pump interposed in the upper section of said coil for circulating the quenching fluid through said inner receptacle and said coil, and a water-motor, adapted to be connected with a water-supply, operatively connected with said pump for driving the latter, the discharge-end of said water-motor opening into said outer receptacle above said overflow, for the purpose set forth.

WALDO G. LUNGER.

In presence of—

M. J. CANADAY,
R. H. ROBE.

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