(No Model.)

# F. WALTON.

## MANUFACTURE OF OXIDIZED OR SOLIDIFIED OIL.

No. 354,755. Patented Dec. 21, 1886.

*Fig. 1.*

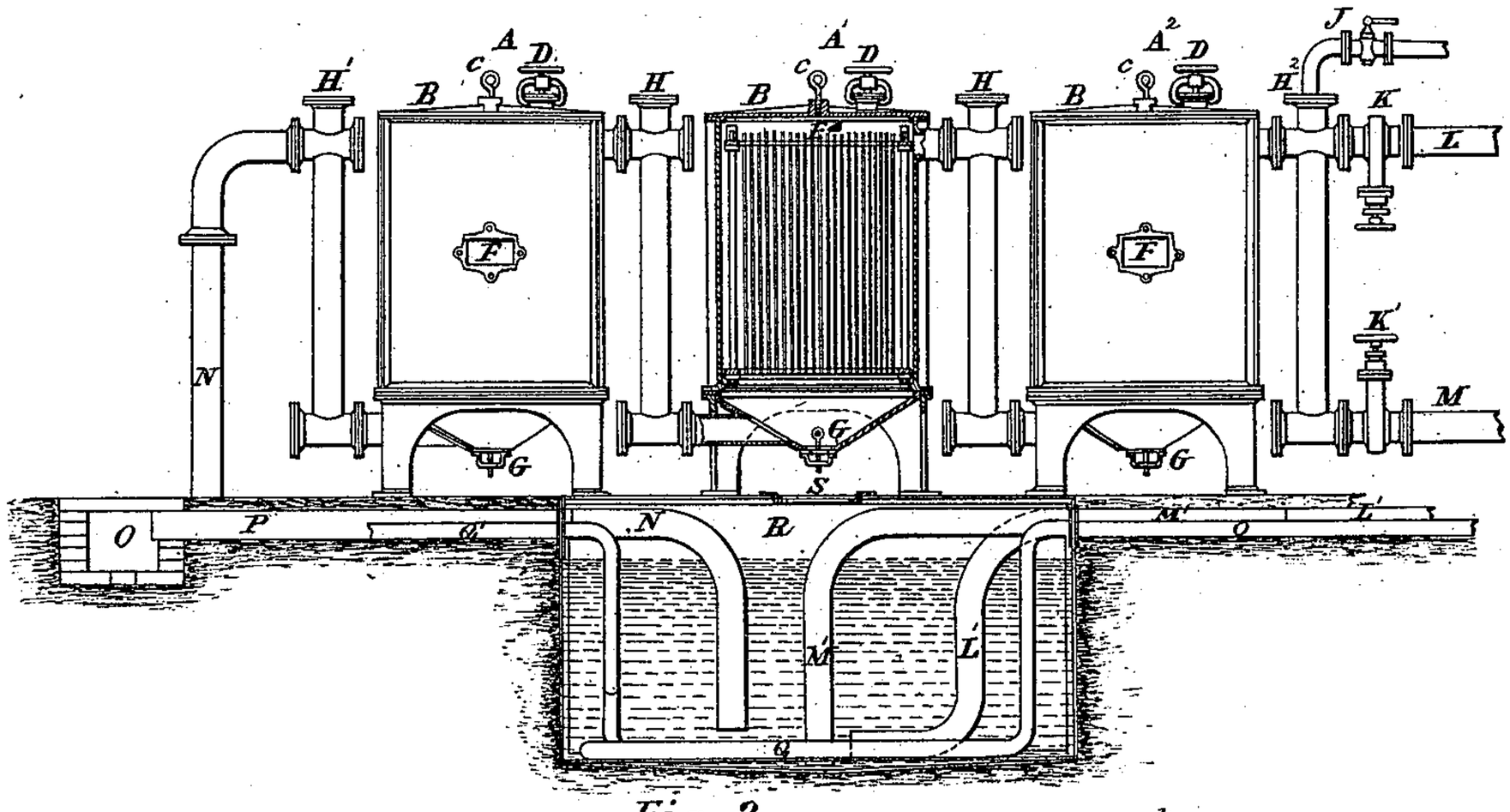
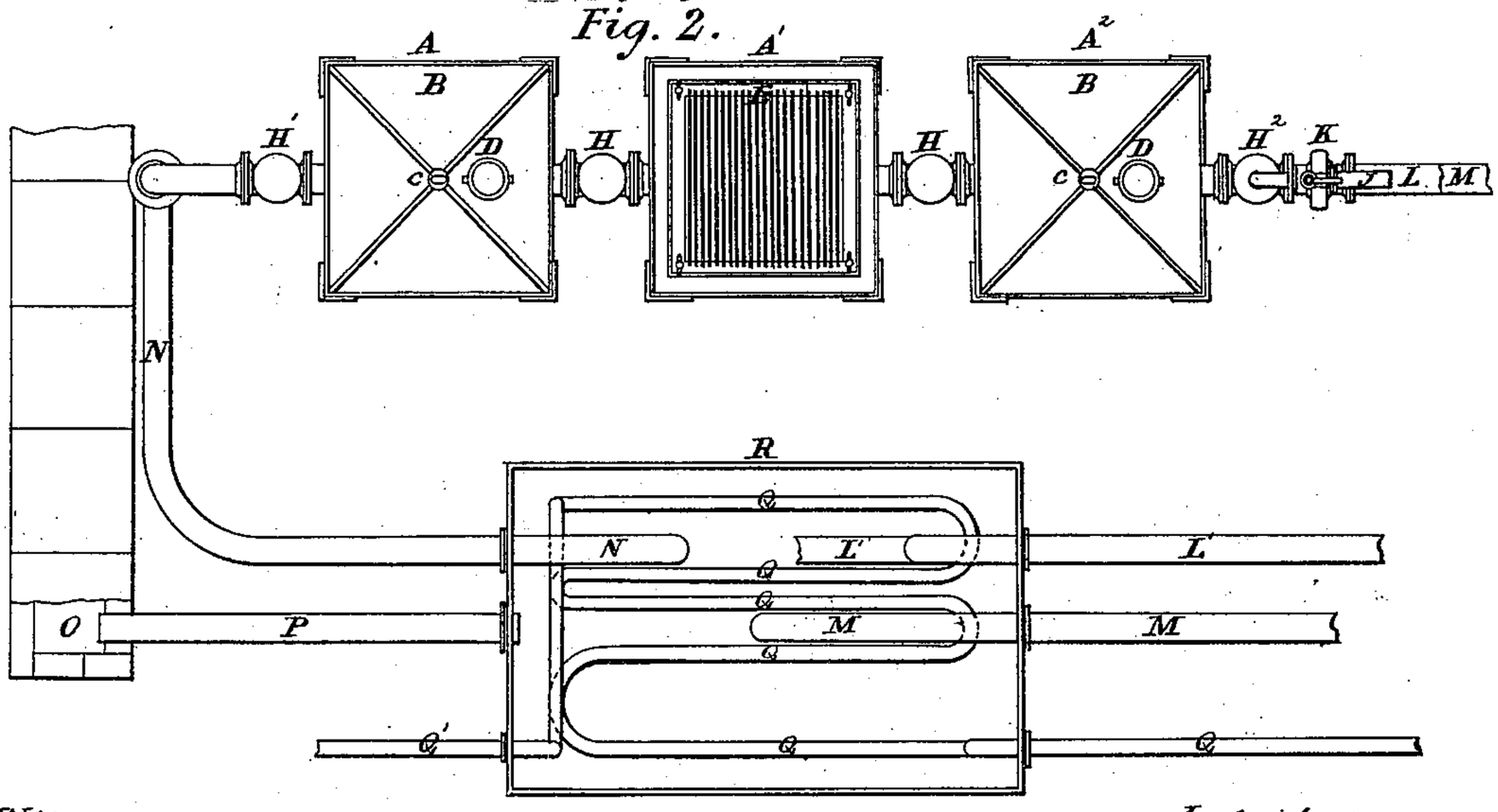



*Fig. 2.*

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# UNITED STATES PATENT OFFICE.

FREDERICK WALTON, OF HEATHAM HOUSE, TWICKENHAM, COUNTY OF MIDDLESEX, ENGLAND.

## MANUFACTURE OF OXIDIZED OR SOLIDIFIED OIL.

SPECIFICATION forming part of Letters Patent No. 354,755, dated December 21, 1886.

Application filed August 23, 1886. Serial No. 211,695. (No model.) Patented in England July 7, 1885, No. 8,250.

*To all whom it may concern:*

Be it known that I, FREDERICK WALTON, a subject of the Queen of Great Britain, residing at Heatham House, Twickenham, in the county of Middlesex, England, manufacturer, have invented certain new and useful Improvements in the Manufacture of Oxidized or Solidified Oil, (for which I have received Letters Patent in Great Britain, No. 8,250, dated the 7th day of July, 1885,) of which the following is a specification.

In the manufacture of solid or oxidized oil as now usually employed the oil is exposed in thin films on extensive surfaces of cotton fabric of a very light texture until by a repetition of dried films a thickness of half an inch or so is obtained, when the whole mass of oil coating the light fabric is broken up and used for the manufacture of linoleum and other cements. This process is open to inconvenience, which I propose to remedy. In the first place I save the expense of the cotton or other fabric, and I obtain oxidized oil which is free from fiber, the presence of which is very objectionable in the manufacture of insulated wire, and in other cases it is inconvenient, as it is liable to interfere with the material being spread evenly over surfaces.

Another advantage of the process which I now employ is, that I can first reduce the oil almost to a treacly or semi-fluid state by well-known preparatory processes, and afterward solidify it in films at a much quicker rate than by the old process formerly patented by me and now in general use.

As oil cannot by ordinary means be spread over large surfaces evenly unless of a certain liquidity, and as the thickness of the film that remains to be dried depends on the thickness or viscidity of the oil, it will be seen that great gain is obtained by the employment of a process which admits of a more viscid and clinging oil being used, which will not run off the surfaces exposed to drying action. Especially is this the case where, as with the mechanism which I provide, the arrangements admit of the application of a current of air charged with an abundance of oxygen at any desired temperature, or charged with any other gases or liquids that may be conducive to the solidifying action.

My improved process has also the advantage that the fumes given off can be blown into a furnace to be consumed, and so all cause of nuisance is avoided.

The apparatus which I employ consists of a number of closed metal chambers connected together by pipes arranged so that the inlet is at the top and the outlet at the bottom of each. They form a continuous series. Each chamber is filled with oil-accumulating plates, for which thin sheets of wrought-iron are suitable. The oil-accumulating plates should be set about one inch to one inch and a half apart. The oil, previously prepared by boiling and thickened by blowing air through it, or otherwise, is introduced, by means of a pump, into one or two of the chambers, after which air is forced into the chambers. The air presses forward the oil out of one chamber into the next, and so throughout the series of chambers, and covers all the oil-accumulating plates in the chambers with a film of oil. So soon as the oil is forced out of the last chamber air continues to pass among the oil-accumulating plates in the chambers so long as the pump or fan employed is kept working.

Figure 1 shows an elevation, partly in section, of the oxidizing apparatus. Fig. 2 shows a plan of the same.

A A′ A² are cast or wrought iron chambers of any convenient size. Their number depends on the quantity of oxidized oil to be produced in a given time. These chambers A are connected by pipes H in such a way that the inlet is at the upper part of each chamber and the outlet at the bottom, which bottom has the shape of a square funnel. At the bottom of this funnel is an inward-lifting valve, G. A cock may be substituted for this valve.

The lids B of the chambers A are provided with hooks *c* for lifting them. They are also provided with air-valves D.

Inside each chamber A is an iron frame, E, carrying a number of oil-accumulating plates, which are set in a distance one from the other of about one inch.

The lids B and the frames E are lifted out

and set in place by a traveling crane. (Not shown in the drawings.)

The chambers A have at F a man-hole, to enable the attendant to observe from time to time the process of oxidation.

The pipe $H^2$ is the delivery-pipe for the oil, and the hot air also passes through it. It has two sluice-valves, K and K′. K is connected by the pipe L with a hot-air blower delivering between three thousand to four thousand cubic feet of air per minute. K′ is connected with the oil-delivering pipe M, which is connected with a rotary pump. M′ is the suction-pipe for the same pump. This pipe descends nearly to the bottom of the oil-tank R. The hot-air blower is likewise connected with the pipe L′, so that the air can be driven either through the chambers A, finding its outlet by the pipe N near the bottom of the tank, or it can be driven direct into the tank through pipe L′, or through both pipes at the same time. At the top of pipe $H^2$ is the pipe J, with a cock. This pipe is connected with an air-compressor.

Q is a coil of pipes heated by steam. Q′ is the outlet branch of this pipe.

The hot air driven through the oil finds its outlet by pipe P, which discharges the air and gases into a flue, O, from whence it is led under a furnace. This furnace is used for heating the air for the blowing-fan. The heating of the air is effected by a coil of pipes which are in contact with the fire. On the top of the tank R is a man-hole, S.

The working of the apparatus is as follows: The tank R is kept about three quarters full of boiled oil. The valve K′ is opened, as also the valve D on the lid of vessel $A^2$. The pump is now set in motion, and oil is discharged into the vessel A′, and when this box is full the valve D on the chamber A′ is shut and D on $A^2$ is opened. The pump is now put out of action, the valve K′ is shut, the cock on pipe J is opened, and compressed air is driven into $A^2$. The oil is forced by this out of $A^2$ into A′. The valve D on this chamber is then shut and D on A opened. The oil is now driven from A′ to A. When A is full, the oil is discharged through H′ and N into the tank R. The air-compressor is now put out of action, the cock on the pipe J is shut, the valves K opened, and the hot-air blower is put in motion. Hot air is now driven in great volume through the pipe L and through all the chambers. It oxidizes the oil adhering to the oil-accumulating plates inside the boxes A. At the same time hot air may be driven through the pipe L′ into the oil in the tank, by which process the oil is thickened and rendered more adhesive. The oxidizing and solidifying of the films of oil upon the plates take place in one to two hours, according to the quantity and temperature of the air driven through the chambers and the oil in the tank. From 120° to 180° will be found suitable temperatures to which to heat the air. The air can, however, be heated to any desired degree, and any volume and pressure may be employed. The air can be charged with oxygen or other gas or fumes that will tend to oxidize or produce other desired changes in the oil. The air may be ozonized by passing it between sheets of glass highly charged with electricity from a Ruhmkorff or other coil—a process well known.

Chemicals or liquids may be passed through the apparatus to facilitate oxidation and solidification of the oil. I can thus expose films of oil to any desired action of liquids or gases which is not possible by the old process.

When the oil-accumulating plates have received a thick coating of oxidized oil by the repeated application of films, they are removed from the apparatus, and the oil can then be stripped off in the following manner: An endless band of metal, preferably brass, runs over two pulleys some distance apart. The band is heated to a temperature of about 400° to 600° Fahrenheit. Oil-accumulating plates are passed through wood rollers, which force the surfaces of the plates against the heated band. The heat acts on the oil, partially liquefying it at the point of contact, and so enabling it to be removed from the plates without abrading the surface of the metal itself. When one side of a plate is cleaned, the plate is reversed.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. My improvement in the manufacture of oxidized or solidified oil, consisting in employing chambers containing oil-accumulating plates, in filling such chambers with oil, then emptying the same, so as to leave a film of oil on the plates, and forcing a current of air through the chambers, substantially as described.

2. The combination, in an apparatus for the manufacture of oxidized or solidified oil, of closed chambers A, oil-accumulating plates within these chambers, and connections for filling and emptying the chambers and for passing heated air through them, all substantially as described.

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Witnesses:

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