**Specification of William Robert Lake : deodorizing and utilizing sewage.**

A.D. 1874, 23rd APRIL. N° 1415.

# SPECIFICATION

OF

# WILLIAM ROBERT LAKE.

## DEODORIZING AND UTILIZING SEWAGE.

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# A.D. 1874, 23rd April. N° 1415.

## Deodorizing and Utilizing Sewage.

(*This Invention received Provisional Protection only.*)

**PROVISIONAL SPECIFICATION** left by William Robert Lake at the Office of the Commissioners of Patents, with his Petition, on the 23rd April 1874.—A communication from abroad by Leopold Hesse, of Collins Street West, Melbourne, Victoria, Merchant.

I, WILLIAM ROBERT LAKE, of the Firm of Haseltine, Lake, & Co., Patent Agents, Southampton Buildings, London, do hereby declare the nature of the said Invention for "AN IMPROVED METHOD OF AND APPARATUS FOR THE DEODORIZATION AND UTILIZATION OF SEWAGE," a communication, to be as follows:—

The improved method of deodorizing and utilizing sewage, which forms the chief part of this Invention, consists, first, in distilling it, and secondly, in providing some suitable ingredient for retaining the valuable portion of the vapours given off from the boiler or retort.

I first agitate the material to be treated so as to make it all of the same consistency, and then supply it to the retorts or boilers in sufficient quantity and subject it to the action of heat until it boils. The vapors which are then given off I conduct through vessels containing some suitable ingredient (say sulphate of iron) which will intercept and retain

the valuable portion of them, leaving the remainder valueless and deodorized to escape.

The apparatus in which I conduct these operations consists of an agitator working in a large reservoir, one or more boilers or retorts, and a series of Woolf's bottles to each retort. The reservoir is by preference sunk in the ground, and built of brick cemented on the inside. A pipe connects it with the retorts, which are by preference made of iron, and heated in any convenient way, whilst a bent pipe springs from the top of each retort and is connected with the first of a series of Woolf's bottles.

The material to be treated is supplied to the said reservoir through a grating or other suitable strainer for preventing the entrance of foreign ingredients. When in this reservoir the agitator is set in motion to bring the whole into a liquid of uniform consistency. When this is done a cock is turned in the connecting pipe leading to the retorts so as to allow of a sufficient quantity being supplied to them. Here the liquid is agitated and boiled, and the resultant vapors are conducted through the bent pipe or neck of each retort into the first of a series of Woolf's bottles, in each of which is a certain quantity of sulphate of iron. As the vapors pass through these bottles the ammonia and other gases are retained by the sulphate of iron, leaving the residue an innocuous and deodorized vapor to escape into the atmosphere.

I prefer to make the retorts of sufficient capacity to hold about seven tons of liquid each, and I consider four tons a sufficient charge.

The Woolf's bottles I prefer to make large enough to hold four hundred gallons each, and I charge each with thirty-two pounds of sulphate of iron. Four, six, or eight may be used for each retort, the thinner the liquid the greater the number required, but four will be the standard. I continue to agitate and boil the contents of the retorts until the same are reduced to a state barely moist and with scarcely any vapor arising therefrom. I then allow the said contents to cool and take the same out of the retorts; this is a fine manure. I next take the contents of the Woolf's bottles and subject the same to mechanical filtration, say through a blanket, and from this I obtain sulphate of ammonia by distillation or evaporation.

The precipitate remaining in the filtering material consists of protoxide and sulphide of iron which only requires to be dried, so that by this

process I produce a fine manure, and two other valuable products, namely, sulphate of ammonia and a combination of protoxide and sulphide of iron, whilst I destroy the noxious character of the material treated.

In the event of the sulphate of iron being insufficient for the purpose an additional quantity may be added through a tube provided for the purpose. The insufficiency of the supply is at once notified by the smell of the escaping vapor, and may also be ascertained by testing the contents of the bottles with litmus paper. When the acid is entirely neutralized more sulphate must be added.

Muriatic or carbolic acid may be used as a substitute for the sulphate of iron, but the products are not so valuable.

Slacked lime may also be used in the first Woolf's bottle, sulphuric acid in the second and third, and sulphate of iron in the fourth, if so preferred. The product of the first bottle will then be gypsum, and that of the remainder sulphate of ammonia. I prefer however to use sulphate of iron in all the bottles.

LONDON:
Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1874.