

Specification of William Alexander Lyttle : treating sewage.

Contributors

Lyttle, William Alexander.

Publication/Creation

London : Great Seal Patent Office, 1875 (London : George E. Eyre and William Spottiswoode)

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A.D. 1874, 13th JULY. N° 2446.

SPECIFICATION

OF

WILLIAM ALEXANDER LYTTLE.

TREATING SEWAGE.

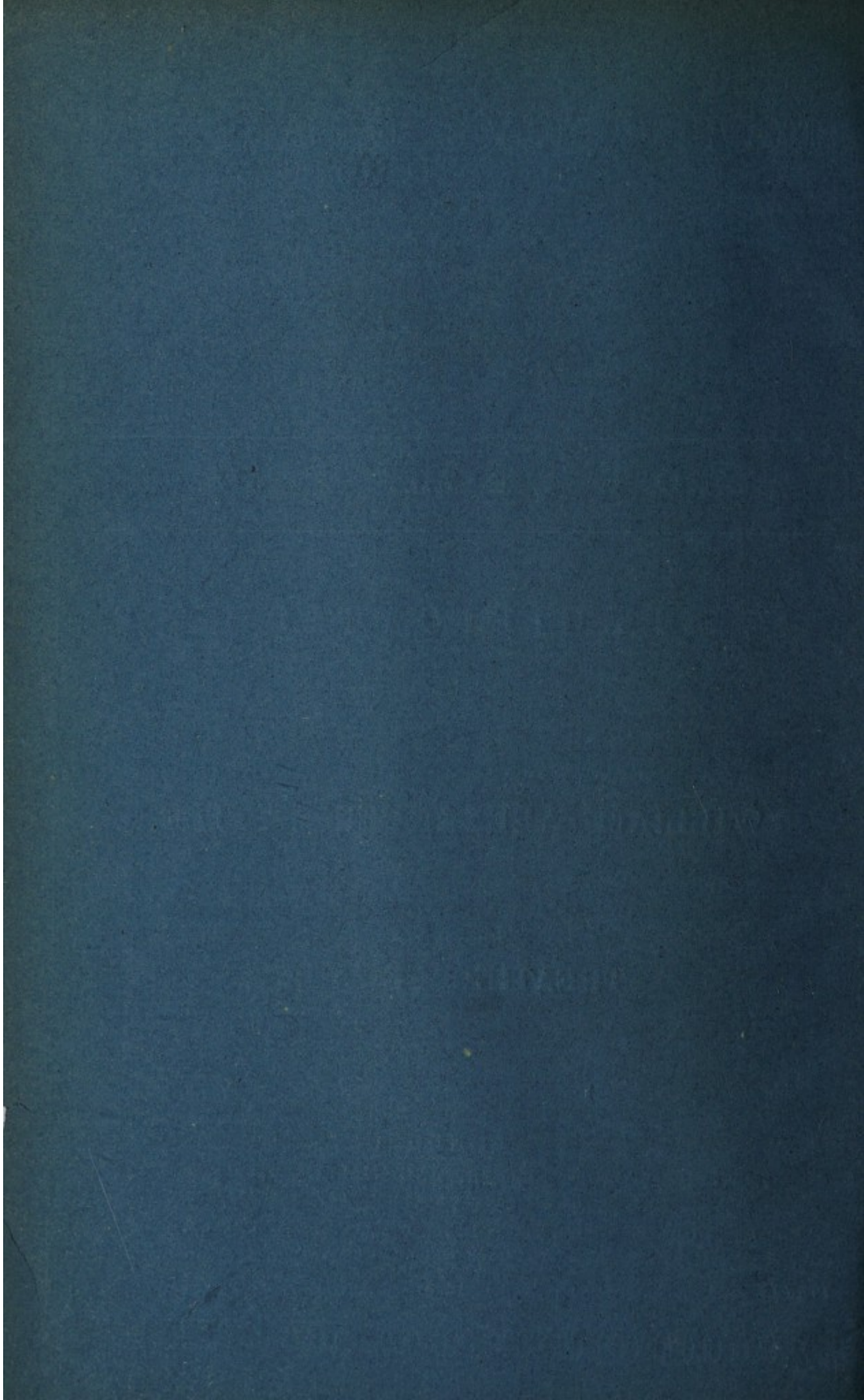
LONDON:

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY:

PUBLISHED AT THE GREAT SEAL PATENT OFFICE,
25, SOUTHAMPTON BUILDINGS, HOLBORN.

Price 4d.

1875.





A.D. 1874, 13th JULY. N° 2446.

Treating Sewage.

(This Invention received Provisional Protection only.)

PROVISIONAL SPECIFICATION left by William Alexander Lyttle at the Office of the Commissioners of Patents, with his Petition, on the 13th July 1874.

I, WILLIAM ALEXANDER LYTTLE, of the Grove, Hammersmith, in the County of Middlesex, Engineer, do hereby declare the nature of the said Invention for "AN IMPROVED PROCESS FOR TREATING SEWAGE AND FOR UTILIZING CERTAIN PRODUCTS DERIVED THEREFROM, WHICH IMPROVEMENTS ARE PARTLY APPLICABLE TO OTHER PURPOSES," to be as follows:—

One of the objects of this process, and its chief claim to the merit of public utility, is to create a market for the sedimentary matter of sewage, commonly known as "sludge," which is now almost everywhere destitute of value, and is a serious loss to the corporations of towns. The new use to which I propose to put this sludge is that of an auxiliary to the materials now used in the smelting of iron.

Owing to the large proportion of carbonaceous matter which the sludge contains, its use will effect a proportional saving in fuel, whilst the silicates derived from the wear of the road metal of the streets will

Lyttle's Improved Process for Treating Sewage.

take the place of so much sandstone for flux. There are several ways in which it may be used. For instance, the sludge may be deodorized by peat charcoal, or by one of those well-known imitations of animal charcoal, consisting of mixtures of peat with lime or clay, or both together, such mixture being coked. The carbon thus added will still 5 further augment the value of the sludge as fuel. The lime, if such is mixed with the charcoal, will also answer to accelerate the fluxing of the ore on account of its intimate incorporation with the silica of the sludge.

Sludge can also be used as the means of agglutinating into solid 10 masses the "duff" or colliery dust of coal, or the dust of peat charcoal for smelting purposes, with or without an admixture of clay or lime, or both together. The sludge fuel can be made into lumps and thrown into the smelting furnace with the ore in the usual way.

Sludge can also be used as an ingredient in the preparation of a 15 metallurgical concrete containing the entire ingredients of a smelting furnace charge in any required proportions, namely, crushed iron ore, quicklime, sand, and powdered fuel; all these materials being well mixed and worked as a plastic mass with the sludge into suitable lumps. 20

The effluent water which passes off when the sludge has been allowed to separate from sewage I propose to clarify as follows:—I provide a pug mill with a false bottom consisting of a bed of gravel acting as a strainer, and I supply peat or any other charcoal to this mill, until, with the admixture of sewage water, it has been worked into a creamy paste. 25 No more charcoal is then added, and by means of a float cock the foul sewage water is allowed to run into the mill at the top as fast as the clarified water escapes through the gravel at the bottom.

When the filtering charcoal is exhausted it can be incorporated with the sludge for smelting purposes with or without a previous coking to 30 extract the ammoniacal salts. This pug mill arrangement I designate a vortex filter, and the same filter will be of great value as the means of supplying absolutely pure water to towns.

The value of this arrangement of filter lies in the fact that its action cannot be impeded by the clogging of its upper stratum with gummy 35 matter, the slow movement of the pugging arms maintaining a constant

Lyttle's Improved Process for Treating Sewage.

mixture of the entire mass. This filter will answer with animal charcoal in all its manufacturing applications as a filtering agent. If all the charcoal required for the daily use of any town as the means of perfectly clarifying its sewage water and deodorizing the sludge is first put to
5 the work of imparting an extra degree of purity to the drinking water supply of such town, the quantity of charcoal will be so large as compared with the organic impurities of such water that the drinking water can thus be rendered absolutely chemically pure without any material deterioration of the charcoal for its subsequent duty to the
10 sewage.

The pug mill is provided with a sluice or door at one side of the bottom, through which the exhausted charcoal can be expelled, and the pugging arms are arranged upon a vertical shaft with a gearing for propulsion by any desired power, in the same way as a brickmaker's
15 pug mill.

Any acid or salt useful in precipitating the ammonia or other impurities of the sewage water may be also supplied as part of the charge of the vortex filter when used for sewage, except salts or acids containing sulphur or phosphorus, these being injurious to iron.
20 Chloride of calcium, and many other chemicals are well-known as useful for this purpose.

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Printers to the Queen's most Excellent Majesty. 1875.

Liddle's Improved Process for Filtering Sewage.

institute of the entire mass. This filter will answer with almost absolute certainty in all the manufacturing applications as a filtering agent. It will also furnish the required quantity for the daily use of any town as the means of purifying the sewage water and decolorizing the sludge is first put to the test of separating an entire degree of purity in the drinking water supply of each town, the quantity of charcoal will be so large as compared with the organic impurities of such water that the filtering water can thus be rendered absolutely chemically pure without any material deterioration of the charcoal for its subsequent duty to the sewage.

The pug mill is provided with a sluice or door at one side of the bottom through which the exhausted charcoal can be expelled, and the pugging arms are arranged upon a vertical shaft with a gearing for propulsion by any desired power in the same way as a butcher's pug mill.

Any acid or salt useful in precipitating the ammonia or other impurities of the sewage water may be also supplied as part of the charge of the vortex filter when used for sewage, except salts or acids containing sulphur or phosphorus, these being injurious to iron. Chloride of calcium, and many other chemicals are well known as useful for this purpose.

It will be seen that the above described process is a simple and effective one, and that it is well adapted for the treatment of sewage water in any town or village.

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