

Specification of William White : treating sewage.

Contributors

White, William.

Publication/Creation

London : Great Seal Patent Office, 1874 (London : George E. Eyre and William Spottiswoode)

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A.D. 1873, *24th July.* N° 2532.

S P E C I F I C A T I O N

OF

WILLIAM WHITE.

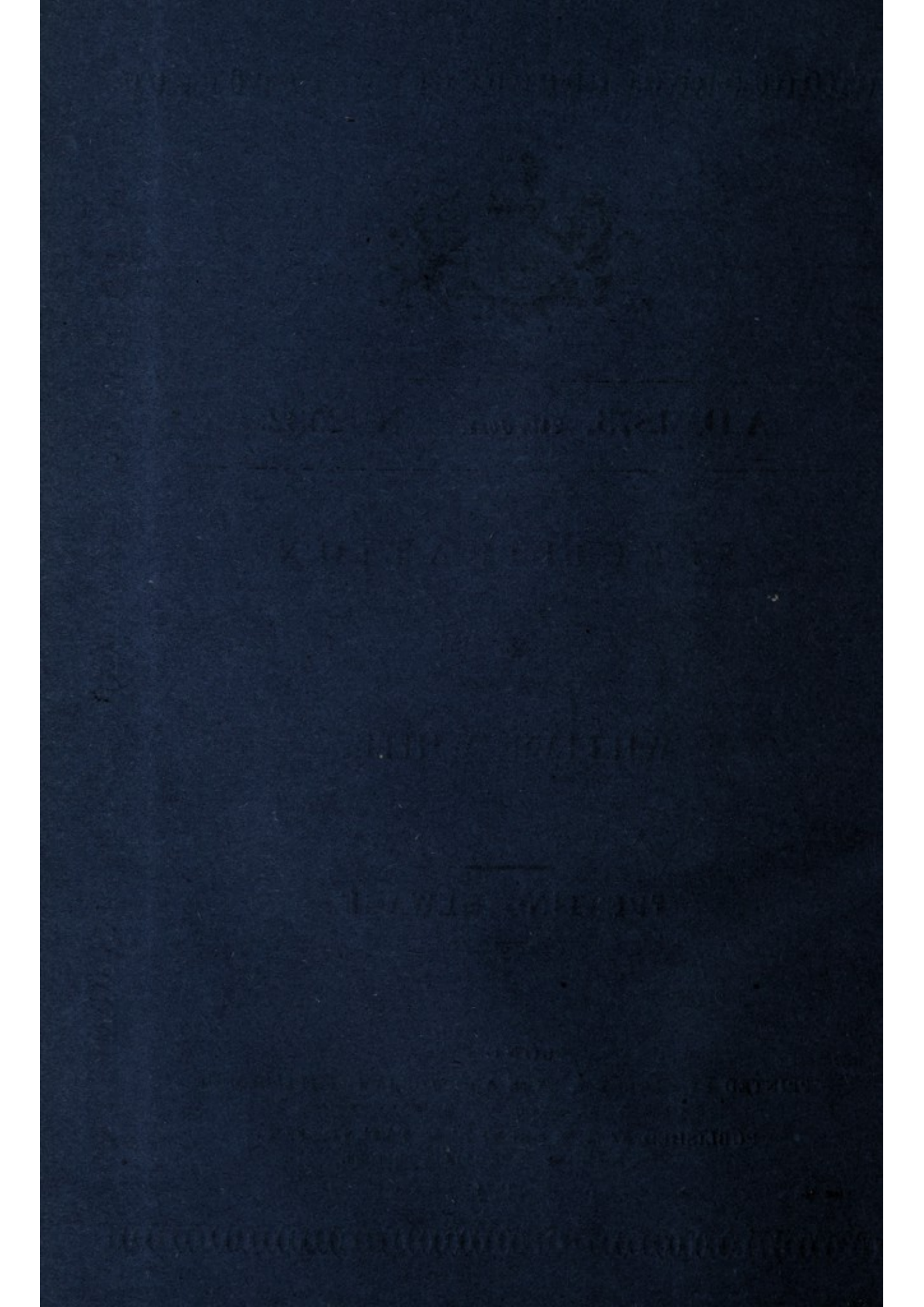
TREATING SEWAGE.

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.

1874.





A.D. 1873, 24th JULY. N° 2532.

Treating Sewage.

LETTERS PATENT to William White, of 30, Thurlow Road, Hampstead, in the County of Middlesex, for the Invention of "IMPROVEMENTS IN THE TREATMENT OF SEWAGE AND CESSPOOL WATER."

Sealed the 11th November 1873, and dated the 24th July 1873.

PROVISIONAL SPECIFICATION left by the said William White at the Office of the Commissioners of Patents, with his Petition, on the 24th July 1873.

I, WILLIAM WHITE, of 30, Thurlow Road, Hampstead, in the County of Middlesex, do hereby declare the nature of the said Invention for "IMPROVEMENTS IN THE TREATMENT OF SEWAGE AND CESSPOOL WATER," to be as follows:—

Chloride of calcium is a waste product in several large manufactures, and is generally thrown away as of no value, but it is exceedingly soluble, and in presence of sulphates precipitates sulphate of lime; and in presence of alkaline carbonates and phosphates precipitates carbonate and phosphosphate of lime, I have found it well adapted for the treatment of ordinary sewage and cesspool water.

White's Improvements in Treating Sewage.

The sewage or cesspool water, or water from urinals being conveyed into suitable settling tanks, I thoroughly mix with the same a sufficiency of chloride of calcium (preferably in spray over the surface) to precipitate the sulphates, carbonates, and phosphates therein, the precipitate thus formed dragging down a large proportion of the albuminous and other 5 organic and nitrogenous matter in suspension and solution, and forming a valuable manure.

In order to produce a larger body of precipitate and thus carry down a still greater proportion of albuminous and other matter, I introduce an excess of chloride of calcium, and subsequently add to such mixture of 10 sewage or cesspool water, or water from urinals and chloride of calcium sulphate of iron, either in solution or otherwise, by which means the excess of chloride of calcium may be converted into sulphate, setting chloride of iron free, which chloride is well known for its astringent action on organic or albuminous matter. The chloride of iron also by 15 oxidation and combination with such organic matter becomes to a great extent gradually converted into an insoluble precipitate.

In order however to remove more rapidly any excess of chloride of iron I precipitate the iron as oxide by the addition of a sufficient quantity of lime; I thus secure a series of three distinct precipitations, 20 each capable of carrying down organic matter; the first being effected with chloride of calcium, the second with sulphate of iron, and the third with lime, leaving a small residue of chloride of calcium in solution.

In some cases, especially when it is desirable to fortify the manure obtained with additional phosphate, I produce a very copious precipitate 25 by dissolving bones, bone ash, horny substances or minerals containing a considerable per centage of phosphate of calcium in hydrochloric acid, and use the mixed solution of phosphate and chloride of calcium for precipitation, introducing to the tank sufficient milk of lime to neutralize any excess of acid, and to ensure the precipitation of the whole of the 30 calcic phosphate. The supernatant water may then after sufficient repose be drawn off, and if still greater purity be required be made to pass through any suitable filtering material; the precipitate consisting largely of sulphate, carbonate, and phosphate of calcium, and organic matter rich in nitrogen, being drained as dry as possible to prepare it 35 for handling for use as manure.

White's Improvements in Treating Sewage.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said William White in the Great Seal Patent Office on the 23rd January 1874.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, WILLIAM
5 **WHITE**, of 30, Thurlow Road, Hampstead, in the County of Middlesex, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twenty-fourth day of July, in the year of our Lord One thousand eight hundred and seventy-three, in the thirty-seventh
10 year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said William White, Her special license that I, the the said William White, my executors, administrators, and assigns, or such others as I, the said William White, my executors, administrators, and assigns, should at any time agree with and no others, from time
15 to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "**IMPROVEMENTS IN THE TREATMENT OF SEWAGE AND CESSPOOL WATER**," upon the condition (amongst others) that
20 I, the said William White, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar
25 months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said William White, do hereby declare the nature of the said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, that is to say:—

30 Chloride of calcium is a waste product in several large manufactures, and is generally thrown away as of no value, but it is exceedingly soluble, and in presence of sulphates precipitates sulphate of lime; and in presence of alkaline carbonates and phosphates precipitates carbonate and phosphate of lime, I have found it well adapted for the treatment of
35 ordinary sewage and cesspool water,

White's Improvements in Treating Sewage.

The sewage or cesspool water, or water from urinals being conveyed into suitable settling tanks, I ascertain the quantity of sulphates, carbonates, and phosphates present, and whether there be any free acid; if so I neutralize with milk of lime. I then thoroughly mix with the same a sufficiency of chloride of calcium to precipitate the sulphates, carbonates, and phosphates therein; the precipitate thus formed dragging down a large proportion of the albuminous and other organic and nitrogenous matter in suspension and solution, and forming a valuable manure. The solution of chloride of calcium is, by preference, thrown over the surface of the sewage by a pump forcing the solution through a rose.

In order to produce a larger body of precipitate and thus carry down a still greater proportion of albuminous and other matter, I introduce an excess of chloride of calcium, and subsequently add to such mixture of sewage or cesspool water, or water from urinals, and chloride of calcium, sulphate of iron, either in solution or otherwise, by which means the excess of chloride of calcium may be converted into sulphate, setting chloride of iron free, which chloride is well known for its astringent action on organic or albuminous matter. The chloride of iron also by oxidation and combination with such organic matter becomes to a great extent gradually converted into an insoluble precipitate.

In order however to remove more rapidly any excess of chloride of iron I precipitate the iron as oxide by the addition of a sufficient quantity of lime; I thus secure a series of three distinct precipitations, each capable of carrying down organic matter; the first being effected with chloride of calcium, the second with sulphate of iron, and the third with lime, leaving a small residue of chloride of calcium in solution. It is preferred that the quantity of chloride of calcium employed should be such that these precipitates should amount at least to 15 grammes per gallon. In some cases, especially when it is desirable to fortify the manure obtained with additional phosphate, I produce a very copious precipitate by dissolving bones, bone ash, horny substances, or minerals containing a considerable per centage of phosphate of calcium in hydrochloric acid, and use the mixed solution of phosphate and chloride of calcium for precipitation, introducing to the tank sufficient milk of lime to neutralize any excess of acid, and to ensure the precipitation of the whole of the calcic phosphate. The supernatant water may then after sufficient repose be drawn off, and if still greater purity be required be

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made to pass through any suitable filtering material; the precipitate consisting largely of sulphate, carbonate, and phosphate of calcium and organic matter, rich in nitrogen, being drained as dry as possible to prepare it for handling for use as manure.

5 Having thus described the nature of my said Invention, and the manner of performing the same, I would have it understood that I claim, the treatment of sewage and cesspool waters with chloride of calcium to produce a precipitate of the sulphates, carbonates, and phosphates of the sewage or cesspool water, which precipitate drags
10 down with it a large proportion of the albuminous and other organic and nitrogenous matter in suspension and solution, and forms a valuable manure, substantially as described.

I also claim the production in sewage and cesspool waters of successive precipitates by the use of an excess of chloride of calcium followed by
15 sulphate of iron, or by sulphate of iron and then lime, substantially as described.

I also claim the precipitation of sewage and cesspool waters by means of a solution in hydrochloric acid, of bones, bone ash, horny substances, or minerals containing phosphate of calcium; such solution being used
20 together with lime, substantially as described.

In witness whereof, I, the said William White, have hereunto set my hand and seal, this Twenty-second day of January, in the year of our Lord One thousand eight hundred and seventy-four.

25

WILLIAM WHITE. (L.S.)

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Printers to the Queen's most Excellent Majesty. 1874.

White's Inventions in Treating Diseases

made to pass through any suitable filtering material; the precipitate con-
sisting largely of sulphate, carbonate and phosphate of calcium and organic
matter, rich in nitrogen, being drained as dry as possible to prepare it
for handling for use as manure.

Having thus described the nature of my said invention, and the
manner of performing the same, I would have it understood that I
claim the treatment of sewage and cesspool waters with chloride of
calcium to produce a precipitate of the sulphate, carbonate, and
phosphate of the sewage or cesspool water, which precipitate sinks
down with it a large proportion of the albuminous and other organic
and nitrogenous matter in suspension and solution, and forms a valuable
manure, substantially as described.

I also claim the production in sewage and cesspool waters of manure
precipitated by the use of an excess of chloride of calcium followed by
sulphate of iron, or by sulphate of iron and lime, substantially as
described.

I also claim the precipitation of sewage and cesspool water by means
of a solution in hydrochloric acid, of bones, bone ash, borax substances,
or minerals containing phosphate of calcium; such solution being used
together with lime, substantially as described.

In witness whereof, I, the said William White, have hereunto
set my hand and seal, this twenty-second day of January, in the
year of our Lord One thousand eight hundred and seventy-
four.

WILLIAM WHITE, (s.s.)

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