

Specification of Bevan George Sloper : treating sewage.

Contributors

Sloper, Bevan George.

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183 Euston Road
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T +44 (0)20 7611 8722
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A.D. 1870, 14th JUNE. N° 1706.

SPECIFICATION

OF

BEVAN GEORGE SLOPER.

TREATING SEWAGE.

LONDON:

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A.D. 1870, 14th JUNE. N° 1706.

Treating Sewage.

LETTERS PATENT to Bevan George Sloper, of Northfleet, in the County of Kent, for the Invention of "**IMPROVEMENTS IN THE TREATMENT OF SEWAGE.**"

Sealed the 13th December 1870, and dated the 14th June 1870.

PROVISIONAL SPECIFICATION left by the said Bevan George Sloper at the Office of the Commissioners of Patents, with his Petition, on the 14th June 1870.

I, BEVAN GEORGE SLOPER, of Northfleet, in the County of Kent, do hereby declare the nature of the said Invention for "**IMPROVEMENTS IN THE TREATMENT OF SEWAGE,**" to be as follows:—

I mix with fresh sewage as it flows in and enters a mixing vessel a large quantity of putrified sewage and containing an abundant quantity of sewage ferment, which acts very rapidly on the urea contained in the sewage and converts it into carbonate of ammonia. I leave the sewage thus mixed until the urea has entirely disappeared, which I estimate will be effected in about an hour.

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Sloper's Improvements in the Treatment of Sewage.

During one half of the time found necessary to obtain this effect I keep up a slow agitation at the bottom of the reservoir to keep the ferment mixed with the liquid sewage. I then cease the agitation and favor the deposit. At the proper time I pump off the upper half or more of the contents of the reservoir, mixing it in a vessel having an 5 agitator with a soluble solution of phosphate of lime, containing also sulphate of lime, the phosphatic salt being in equivalent proportions to act on the carbonate of ammonia in the sewage, and formed from the urea or other organic matter. I then pass the mixed liquids into another vessel, in which they are well mixed with an equivalent 10 quantity of sulphate of magnesia, forming a compound salt of phosphate of ammonia and magnesia. I then pass the liquid holding all these insoluble and soluble substances into another mixing vessel and mix it with a small quantity of soluble sulphate of alumina and milk of lime. The whole then flows off into a long reservoir and deposits its solid 15 contents, consisting of the insoluble matter naturally suspended in the sewage, phosphoric acid, ammonia, sulphuric acid, magnesia, alumina, and lime, all ingredients of the highest value in agriculture, while the sewage water is clear and free from organic matter.

In the foregoing description I have supposed the process to be in full 20 operation, but it is necessary at first to be provided with a large quantity of putrified sewage.

SPECIFICATION in pursuance of the conditions of the Letters Patent filed by the said Bevan George Sloper in the Great Seal Patent Office on the 14th December 1870.

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TO ALL TO WHOM THESE PRESENTS SHALL COME, I, BEVAN GEORGE SLOPER, of Northfleet, in the County of Kent, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Fourteenth day of June, in the year of our Lord One thousand eight hundred and seventy, in the thirty-third 30 year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Bevan George Sloper, Her special licence that I, the said Bevan George Sloper, my executors, administrators, and assigns, or such others as I, the said Bevan George Sloper, my executors, administrators, and assigns, should at any time agree with, and no others, 35

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from time 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 TREAT-
5 MENT OF SEWAGE," upon the condition (amongst others) that I, the said Bevan George Sloper, 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
10 be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

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

My Invention relates, first, to favoring the fermentation of the sewage under treatment for the purpose of rapidly converting the nitrogenous matters contained therein into carbonate of ammonia; and, secondly, to the employment of soluble salts of magnesia, soluble
20 alkaline phosphates, and the soluble phosphates of lime, for the purpose of forming an ammoniacal phosphate of magnesia and precipitating it charged with various animal matters contained in the sewage.

In order to favor the fermentation of the sewage which I operate upon I mix it with about an equal quantity of sewage which has
25 already fermented, and which contains an accumulated quantity of the ferment produced by the fermentation of the urine in the sewage. I keep the mixed sewage agitated for a sufficient time (say half an hour, more or less), until the nitrogenous matters capable of being acted upon by the ferment are converted into carbonate of ammonia. I then
30 allow the sewage to rest, and when the sediment it contains has subsided to about one-half the depth of the reservoir I draw off the supernatant liquid into another reservoir.

I then mix with this ammoniacal sewage a solution or solutions containing a soluble salt of magnesia and a soluble phosphate of soda or
35 potash or a soluble phosphate of lime. I allow or use two chemical equivalents of a magnesian salt to each one equivalent which the sewage contains of carbonate of ammonia. The quantity of ammonia in the sewage I ascertain by previous analysis. I allow or use one chemical

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equivalent of a phosphatic salt for each one equivalent of ammonia in the sewage. I agitate the sewage well in order to assist the formation and precipitation of the ammoniacal phosphate of magnesia, bearing with it a large quantity of organic animal matters. When it is necessary to clarify and deodorize the sewage I mix with it a small quantity of 5 sulphate of alumina and its equivalent proportions of lime and small quantities of sulphate of iron and of chloride of lime.

When the temperature of the sewage is not sufficiently high to favor its fermentation it must be increased a few degrees of heat by artificial means.

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And having now described the nature of my said Invention, and in what manner the same is to be performed, I declare that I claim as my "Improvements in the Treatment of Sewage,"—

First. Favoring the fermentation of the sewage under treatment by the means herein-before described.

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Second. The employment of soluble salts of magnesia and of soluble alkaline phosphates and of the soluble phosphates of lime in the manner herein-before described to precipitate the ammoniacal phosphate of magnesia charged with various animal matters contained in the sewage.

In witness whereof, I, the said Bevan George Sloper, have hereunto 20 set my hand and seal, this Second day of December, One thousand eight hundred and seventy.

B. G. SLOPER. (L.S.)

LONDON:

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Printers to the Queen's most Excellent Majesty. 1870.