

## **Specification of David Forbes and Astley Paston Price : treating sewage.**

### **Contributors**

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Price, Astley Paston.

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A.D. 1870, *2nd MARCH.* N° 607.

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

OF

DAVID FORBES  
AND  
ASTLEY PASTON PRICE.

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TREATING SEWAGE.

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LONDON:

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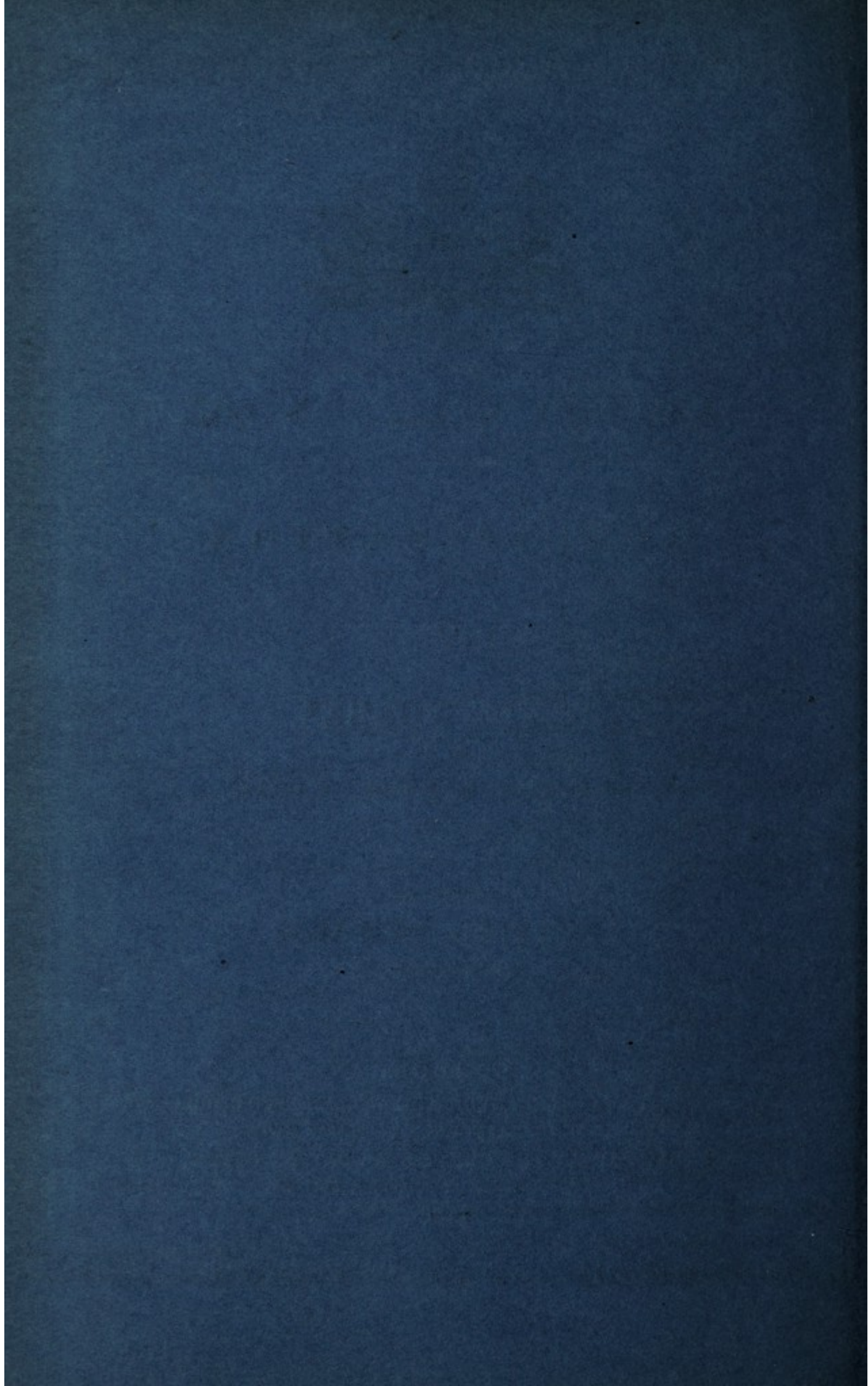
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### Treating Sewage.

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**LETTERS PATENT** to David Forbes, Consulting Engineer, of York Place, Portman Square, and Astley Paston Price, Consulting Chemist, of 47, Lincoln's Inn Fields, both in the County of Middlesex, for the Invention of "**IMPROVEMENTS IN THE TREATMENT OF SEWAGE AND IN THE PRODUCTION OF MANURES.**"

Sealed the 16th August 1870, and dated the 2nd March 1870.

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**PROVISIONAL SPECIFICATION** left by the said David Forbes and Astley Paston Price at the Office of the Commissioners of Patents, with their Petition, on the 2nd March 1870.

We, **DAVID FORBES**, Consulting Engineer, of York Place, Portman  
5 Square, and **ASTLEY PASTON PRICE**, Consulting Chemist, of 47, Lincoln's  
Inn Fields, both in the County of Middlesex, do hereby declare the  
nature of the said Invention for "**IMPROVEMENTS IN THE TREATMENT OF  
SEWAGE AND IN THE PRODUCTION OF MANURES,**" to be as follows:—

These improvements relate, firstly, to the preparation and treatment  
10 of natural products, consisting essentially of phosphates of alumina,  
such, for example, as occur in the West Indian Islands, so as to render

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the same useful for the treatment of sewage, and consists in subjecting such natural phosphates of alumina to the action of sulphuric acid, and the employment of the resulting products alone or in conjunction with lime or with carbonate of lime for the treatment of sewage in order that certain constituents of the same may be thereby removed, and 5 be rendered available for agricultural purposes.

The second part of this Invention relates to the employment of certain deodorising agents, such as animal or vegetable charcoal, in conjunction with the natural phosphates of alumina after having been treated as before mentioned. 10

The proportions in which the deodorising agents are to be employed will depend upon the degree of deodorisation it is desired to obtain and the condition of the sewage under treatment. A quantity equal to from about 20 to 50 per cent. by weight of the natural phosphate of alumina employed will give good results, but we do not limit ourselves to these 15 proportions.

**SPECIFICATION** in pursuance of the conditions of the Letters Patent, filed by the said David Forbes and Astley Paston Price in the Great Seal Patent Office on the 30th August 1870.

**TO ALL TO WHOM THESE PRESENTS SHALL COME**, we, DAVID 20 FORBES, Consulting Engineer, of York Place, Portman Square, and ASTLEY PASTON PRICE, Consulting Chemist, of 47, Lincoln's Inn Fields, both in the County of Middlesex, send greeting.

**WHEREAS** Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Second day of March, in the year 25 of our Lord One thousand eight hundred and seventy, in the thirty-third year of Her reign, did, for Herself, Her heirs and successors, give and grant unto us, the said David Forbes and Astley Paston Price, Her special license that we, the said David Forbes and Astley Paston Price, our executors, administrators, and assigns, or such others 30 as we, the said David Forbes and Astley Paston Price, our executors, administrators, or assigns, should at any time agree with, and no others, 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 35

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Islands, and Isle of Man, an Invention for "IMPROVEMENTS IN THE TREATMENT OF SEWAGE AND IN THE PRODUCTION OF MANURES," upon the condition (amongst others) that we, the said David Forbes and Astley Paston Price, our executors or administrators, by an instrument in writing under our 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 months next and immediately after the date of the said Letters Patent.

10 **NOW KNOW YE**, that we, the said David Forbes and Astley Paston Price, do hereby declare the nature of our said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement, that is to say :—

15 Our said Invention relates to the preparation and treatment of natural products consisting essentially of phosphates of alumina, such, for example, as occur in the West Indian Islands, so as to render the same useful for the treatment of sewage, and consists in subjecting such natural phosphates of alumina to the action of sulphuric acid, and in the employment of the resulting products either alone or in conjunction with lime or with carbonate of lime for the treatment of sewage in order that certain constituents of the sewage may be thereby removed and be rendered available as fertilizing agents for agricultural purposes.

25 In carrying out our Invention we firstly submit to the action of sulphuric acid the natural phosphates of alumina, which phosphates of alumina are capable of being decomposed and rendered soluble by the employment of sulphuric acid. Having converted the phosphates into a soluble condition, or having obtained a solution of the phosphates of alumina, they may either be employed in their concentrated form or a solution of the same may be diluted, and they are then in a fit and proper condition to be employed for the treatment of sewage. Whilst the sewage is contained in a cistern or reservoir, or whilst it is in the act of flowing thereinto, the requisite proportion of the soluble phosphates of alumina is to be added thereto, and after thorough admixture with the sewage by the use of agitators or other well known means the sewage so treated may be allowed to remain tranquil in the reservoir in order that subsidence of the resulting precipitate may be effected, or after having

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added to the sewage the requisite amount of the soluble phosphates of alumina, lime (by preference in the form of milk of lime) is to be added in such quantity as that the phosphates in solution shall be precipitated. This result will be known by the sewage acquiring a neutral or alkaline reaction, or the lime may be firstly added and the solution of the 5 phosphates of alumina added subsequently, but we prefer the former process, or the soluble phosphates of alumina may be firstly decomposed by means of lime or carbonate of lime, and the resulting precipitate may be employed for the purpose of effecting the separation of certain constituents of sewage. 10

In conjunction with any of the before-mentioned methods of carrying out our Invention deodorizing agents, such, for example, as animal or vegetable charcoal, may be employed, but good results will be obtained by the employment of the phosphates of alumina alone or in conjunction with lime as before mentioned. The sewage after treatment by either of 15 the before-mentioned processes is allowed to settle, and the clear or supernatant water may be run off and the deposit or precipitate collected and removed and employed for agricultural purposes either in the moist condition or after having been submitted to a drying or desiccating process. Or the precipitated phosphates may be again submitted to the 20 action of sulphuric acid, and the solution be again employed for the treatment of sewage in a manner similar to that before described. The proportions in which the soluble phosphates of alumina may be employed will vary with the sewage to be operated upon and the quality of the manure desired to be obtained; we have obtained good results by the 25 employment of about two parts by weight of the soluble phosphates of alumina to every one thousand parts by weight of sewage treated, but we do not limit ourselves to such proportions.

Having now described and particularly ascertained the nature of the said Invention, and the manner in which the same is or may be used or 30 carried into effect, we would observe in conclusion that what we consider to be novel and original, and therefore claim as the Invention secured to us by the herein-before in part recited Letters Patent is, the use of the natural phosphates of alumina for the treatment of sewage and for the production of manures by firstly submitting the natural phosphates of 35 alumina to the action of sulphuric acid, and the employment of such resulting products either alone or in conjunction with lime or with

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carbonate of lime for the treatment of sewage, substantially in the manner herein-before described.

5 In witness whereof, we, the said Astley Paston Price and David Forbes, have to this our Specification set our hands and seals, this Twenty-third day of August One thousand eight hundred and seventy.

ASTLEY P. PRICE. (L.S.)

DAVID FORBES. (L.S.)

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LONDON :

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,  
Printers to the Queen's most Excellent Majesty. 1870.





