

## **Specification of Alexander Melville Clark : treating sewage, &c.;**

### **Contributors**

Clark, Alexander Melville.

### **Publication/Creation**

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A.D. 1872, 6th FEBRUARY. N<sup>o</sup> 388.

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

OF

ALEXANDER MELVILLE CLARK.

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TREATING SEWAGE, &c.

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LONDON:

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A.D. 1872, 6th FEBRUARY. N<sup>o</sup> 388.

### Treating Sewage, &c.

*(This Invention received Provisional Protection only.)*

**PROVISIONAL SPECIFICATION** left by Alexander Melville Clark at the Office of the Commissioners of Patents, with his Petition, on the 6th February 1872.—A communication from abroad by Lucien Henri Blanchard, Ivar Bang, and Louis Léon Henri Provost, all of 13, Boulevard St. Martin, Paris.

I, **ALEXANDER MELVILLE CLARK**, of 53, Chancery Lane, in the County of Middlesex, Patent Agent, do hereby declare the nature of the said Invention for "**IMPROVEMENTS IN THE TREATMENT OF SEWAGE AND OTHER AMMONIACAL LIQUORS, AND IN THE MANUFACTURE OF CERTAIN SALTS FOR THIS PURPOSE,**" to be as follows:—

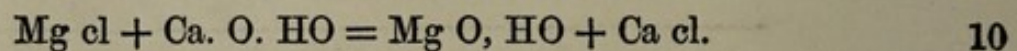
This Invention relates to improved processes for fixing the ammonia contained or in course of formation in liquid sewage and gas liquors and in various ammoniacal solutions by the application for this purpose of bi-magnesian phosphate ( $\text{Ph}_2\text{O}_5 \cdot 2 \text{MgO} \cdot \text{HO}$ ) or calcio-magnesian phosphate ( $\text{Ph} \text{O}_5 \text{Ca} \text{OMg} \text{O}, \text{HO}$ ). These two substances may be obtained in different ways and by the aid of various reagents, but the following is the method in which they are preferably prepared:—

1st. In order to produce bi-magnesian phosphate, fossil or other

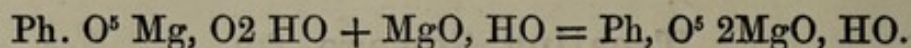


*Clark's Improvements in Treating Sewage, &c.*

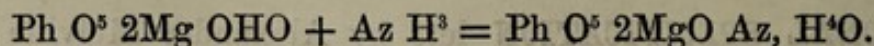
phosphates are treated with dilute sulphuric acid, the reaction producing sulphate of lime and mono-calcic phosphate. An equivalent of sulphate of magnesia is then added, and after a double decomposition sulphate of lime is again formed and soluble mono-magnesian phosphate. After decanting and repeated washings the whole of the mono-magnesian phosphate is eliminated. One equivalent of magnesia in paste is then added to the decanted liquor. This magnesia is produced by treating a solution of chloride of magnesia (mother waters of salt works) with its equivalent of milk of lime, according to the following reaction:—



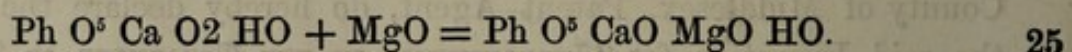
The magnesia when added to the decanted liquor transforms the mono-magnesian phosphate contained in a state of solution into insoluble bi-magnesian phosphate by the following reaction:—



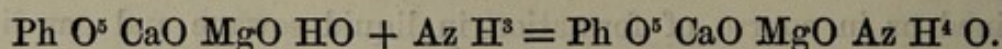
The bi-magnesian phosphate is recovered in a dry or pasty state. This salt reacts directly and with great power on ammonia, which it fixes in the form of insoluble ammonio-magnesian phosphate, as indicated by the following formula:—



2ndly. In order to produce calcio-magnesian phosphate the fossil or other phosphates are treated with dilute sulphuric acid as before. The solution of mono-calcic phosphate thus obtained is then decanted, and to it is added an equivalent of magnesia produced in the manner above described, when the following reaction takes place:—



This new salt, viz., calcio-magnesian phosphate, acts in a similar manner to the bi-magnesian phosphate on ammonia, which it fixes in the form of ammonio-calcio-magnesian phosphate, thus,—



In certain cases the bi-magnesian phosphate obtained in the manner described is employed in a liquid state to act on ammoniacal waters, said salt being readily soluble in a solution of chloride of magnesium (mother waters of salt works). This method is more particularly efficacious for fixing the ammonia as it forms in sewage waters.



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*Clark's Improvements in Treating Sewage, &c.*

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The Invention thus consists,—

1st. In the application and employment of bi-magnesian and calcio-magnesian phosphates, either dry or in a paste or liquid condition, for acting on and fixing ammonia.

5 2ndly. The processes herein-before described of manufacturing these salts.

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