Specification of Sir James Murray : deodorizing sewage matters, manufacture and distribution of manures, &c.;

Contributors

Murray, James, Sir, 1788-1871.

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A.D. 1857 . . . . . N° 114.

SPECIFICATION

OF

SIR JAMES MURRAY.

DEODORIZING SEWAGE MATTERS, MANUFACTURE AND DISTRIBUTION OF MANURES, &c.

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A.D. 1857 . . . . . N° 114.

Deodorizing Sewage Matters, Manufacture and Distribution of Manures, &c.

LETTERS PATENT to Sir James Murray, Kn^t^, and M.D., of Dublin, in the County of Dublin, for the Invention of "ABATING THE SMELLS AND INCREASING THE FERTILIZING USEFULNESS OF LIQUID MANURES, SEWAGE, GAS OR OTHER LIQUORS, AND FOR MEANS OF RAISING OR PROPELLING SUCH MIXTURES AND OTHER SOLIDS OR FLUIDS TO CONVENIENT HEIGHTS OR DISTANCES."

Sealed the 3rd April 1857, and dated the 14th January 1857.

PROVISIONAL SPECIFICATION left by the said Sir James Murray at the Office of the Commissioners of Patents, with his Petition, on the 14th January 1857.

I, Sir JAMES MURRAY, Knt., and M.D., of Dublin, in the County of Dublin, do hereby declare the nature of the said Invention for "ABATING THE SMELLS AND INCREASING THE FERTILIZING USEFULNESS OF LIQUID MANURES, SEWAGE, GAS, OR OTHER LIQUORS, AND FOR MEANS OF RAISING OR PROPELLING SUCH MIXTURES AND OTHER SOLIDS OR FLUIDS TO CONVENIENT HEIGHTS OR DISTANCES," to be as follows:—

To effect these improvements, I use strong vats or condensing vessels or boats, placed in water or in the ground or above it, one or more of them at equal or different levels, and fixed or movable, as may be most convenient, or to float on rivers, bays, or canals, or to be immersed at shores or wharfs.

The vessel or vessels are well fortified by walls, earth, or clay, puddling hoops, frames, bars, or other supports around them outside, so as to bear and resist a pressure of one to five or six atmospheres; they are also lined by

metallic or other plates, timber, tiles, slate, or by suitable lutes, cements, gutta percha, or india-rubber, resinous, vitrious, or bituminous covering, or by animal, vegetable, or mineral fabrics, adapted to render the inner surface of these condensers air-tight. These condensers are also furnished with strong pipes or tubes having valves or cocks to admit or discharge sewage drainage, liquid manures, gas liquors, with any solid or other deposits, animal or vegetable, that may be suspended or commingled in these fluids. The vessels are also fitted inside with fans on axles or shafts suitable for agitating such liquid mixtures, and also revolving through streams of fixed air, so as to carbonate them, abate offensive smells, fix volatile vapours, and render the products or contents better adapted for land and crops, and to press on fliuds to impel them or other bodies. Further, I genetrate within these vessels themselves, or force into them from separate generators, a great excess of fixed air, more than saturates these liquid manures, so as to compress their surface and force them up the pipes (when opened) to any convenient height or distance, or into other vats or condensers on a higher level, in order that by renewed impregnation and compression of fixed air, the liquid manures, with the solid particles previously contained in them, or afterwards added to them, may be forced into a higher vessel or series of vessels or reservoirs.

I obtain the fixed air from carbonates of lime or magnesia, or alkaline carbonates, bicarbonates, or subcarbonates previously introduced into the condensers at the bottom, after which equivalents of a mineral acid, or acids diluted or concentrated or mixed into a dry state with light porous or suitable animal, vegetable, or mineral powders, such as charcoal; or I introduce acidulous, sulphurous acid gas, or other acid gases mixed in water or absorbed in carbon, of peat, coal, wood, or the like, so that when agitation is rapidly revolving, the above alkaline and acid ingredients may be brought, all of them together, or one or more acid and alkaline carbonate, into contact, that the fixed air may be evolved, according to the well-known action of acid and alkaline carbonates, on each other.

I prefer effecting all these objects in the same condensers among the manures, but the gas in some instances may be extricated in separate generators, in the manner used by makers of aerated mineral waters, but my method of evolving fixed air and operating with it in the condensers themselves makes manures better, and gains more pressure as a source of motive power.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Sir James Murray in the Great Seal Patent Office on the 14th July 1857.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, Sir James Murray, Knight, and Doctor of Medicine, of Dublin, in the County of Dublin, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Fourteenth day of January, in the year of our Lord One thousand eight hundred and fifty-seven, in the twentieth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Sir James Murray, Her special license that I, the said Sir James Murray, my executors, administrators, and assigns, or such others as I, the the said Sir James Murray, my executors, administrators, and 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 Islands, and Isle of Man, an Invention for "Abating the Smells and Increasing the Fertilising Usefulness of Liquid Manures, Sewage, Gas, or other Liquors, and for Means of Raising or Propelling such Mixtures and other Solids or Fluids to Convenient Heights or Distances," upon the condition (amongst others) that I, the said Sir James Murray, by an instrument in writing under my hand and seal, 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.

NOW KNOW YE, that I, the said Sir James Murray, 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 by the following statement, that is to say:—

My Invention, for "Abating the Smells, and Increasing the Fertilising Usefulness of Liquid Manures, Sewage, Gas, or other Liquors, and for Means of Raising or Propelling such Mixtures and other Solids or Fluids to Convenient Heights or Distances," consists in the means herein-after described, partly chemical, and partly mechanical, of disinfecting and deodorising solid and fluid matters or substances; also of converting them into useful manures for agricultural purposes; and, lastly, of impelling solid and fluid matters and raising them to such heights or transmitting them to such points or places as

may be required, without the aid of pistons or such mechanism as is usually employed when steam and other gases and fluids are used as a motive power.

To effect these improvements, I use strong vats or condensing vessels or boats, placed in water or in the ground, or above it, one or more of them at equal or at different levels, and fixed or moveable, as may be most convenient, or to float on rivers, bays, or canals, or to be immersed at shores or wharves. The vessel or vessels are well fortified by walls of earth or clay, puddling hoops, frames, bars, or other supports surrounding them externally, so as to bear or be capable of resisting a pressure of from one to five or six atmospheres; they are also lined by metallic or other plates, timber, tiles, slate, or by suitable lutes, cements, gutta percha, or india-rubber, resinous, vitrious, or bituminous covering or coating, or by animal, vegetable, or mineral fabrics adapted to render the inner surface of these vessels or condensers air-tight. The condensers are also furnished with strong pipes or tubes having suitable valves or cocks to admit gas, steam, or vapour, for discharging sewage drainage, liquid manures, or gas liquors, with any solid or other deposits, animal or vegetable, that may be suspended or commingled in these fluids. Some of these vessels are also fitted inside with fans or chains on axles or shafts suitable for agitating such liquid mixtures, and also revolving or passing through them acids and carbonates to evolve streams of fixed air, so as to carbonate the liquids, abate offensive smells, fix volatile vapors, ammonia, and the like, and render the products better adapted for fertilising lands and crops, and also to press on the fluids to impel them or other bodies. Further, I generate within these vessels themselves, or force into them from separate generators, a great excess of fixed air, more than saturates these liquid manures, so as to press upon their surface and force them up the pipes (when opened) to any convenient height or distance, or so as to be discharged into reservoirs, vats, or cisterns, in order that by renewed impregnation with and compression by fixed air, the liquid manures, and the solid particles, mixed, suspended, or carried in the fluids, may, with the excess of fixed air, be discharged again either into pipes or into a higher series of cisterns, vessels, or reservoir, so as to attain the required elevation.

I obtain the fixed air from carbonates of lime, limestones, shells, bones, coraline or the like, or of magnesia, or alcaline carbonates, bicarbonites, or subcarbonates, previously introduced into the condensers or generators in perforated cages or nets at the bottom; after which, or before it, equivalents of a mineral acid or acids, diluted or concentrated, or mixed into a dry state with light porous or suitable animal, vegetable, or mineral powders, such as charcoal, coprolite, and apatite, soot or bonedust, acidulous salts, or sulphurous acid, or other acid

gases, mixed in water, or absorbed in carbon of peat, coal, wood, bone black, or the like are introduced, so that when agitation is rapidly going on, the above alcaline and acid ingredients, or one or more of each, may be brought into contact and action, and that the fixed air may be evolved, according to the well-known agency of acids and alcaline carbonates, on each other. I prefer effecting all these objects in the same cistern among the manures, but the gas in some instances may be generated in separate generators, in the manner used by the manufacturers of aerated mineral waters, but my method of evolving fixed air in the cisterns themselves makes manure better, and gains more pressure as a source of motive power.

In order, however, that my Invention may be fully understood and readily carried into effect, I will proceed to describe more particularly the means above referred to, by which the objects of my Invention may be severally accomplished. But I will premise that the means employed for the purpose are chemical, in so far as they consist in acting upon the various solid and fluid matters referred to, so as to decompose them, or change their qualities, or form new compounds; and they are mechanical, so far as they consist in the use of apparatus for receiving and containing such solid and fluid matters, for stirring and agitating them, and for transmitting or conveying them to convenient points or places as required.

In order to carry out these objects and operations, I introduce perforated boxes, cages, baskets, nets, or grates of powdered dolomite, magnesian, or other limestone, with or without coraline, apatite, coprolite, powdered bones, shells, or other animal or mineral substances containing carbonic acid, into any of the vessels already mentioned. I suspend the cases or netting containing these carbonates by cranks or pullies, by metallic rods passing through stuffing boxes at the top or end of such vessels. When muriatic acid or gas acidulates the drainage or the current of sewage, and it is closed up in the tanks, the carbonates are agitated or churned up and down in the liquid, thereby generating effervescence, and causing disengagement of gas; sulphuric or sulphurous acid are likewise sometimes used.

The hydrochloric acid or gas, after being used to abate offensive smells in drainage, rushing into the vats or tanks, comes into repeated contact with the nets of dolomite, &c., this with any other modes of agitation hastens the formation of soluble muriates, and extricates fixed air sufficient to bicarbonate some of the remaining magnesian earth from which the muriatic acid took the lime; the fixed air also presses upon the liquids, and expels them up from the tanks or strong vats about seventeen feet of rise in the water guage, balancing half the common atmospheric pressure.

The situations, extent of workings, elevation to be gained, with many other circumstances, occasion such variety and modification in applying the principles above referred to, that drawings of vessels and machinery could not well exhibit adequate information, or convey particular descriptions of all the apparatus and processes for particular sites or shapes and dimensions of cisterns. But it is to be observed that the vats or condensing vessels and other apparatus are in all cases to be adapted in size and arrangement to receive the solid and fluid matters required to be passed into them, to be therein acted upon chemically and mechanically, and to discharge, convey, and distribute them as required.

It is also to be observed that the condensers are or may be formed and constructed with an interior casing or lining composed of a material more or less elastic in its nature, such casing or lining being supported or enclosed by a strong outer casing. This construction of the condenser is intended to admit of the internal vessel or lining being made to expand and contract alternately by the expansion and condensation of the gas or air generated or introduced therein. By this means the fluid and solid matters may be discharged from the condensers, and impelled so as to be conveyed to their required situation, so that whether it be required to carry forward materials intended for manures or water purified from impure matters previously held in solution therein, the reception of the material into the condensers, and its discharge therefrom, may be effected by the alternate dilation or expansion and contraction of the elastic lining caused by the alternating pressures of the gas or air on its inner surface, and the fluids (with matters held in suspension therein) on its outer surface; the latter being forced by the expanding of the elastic lining through pipes as required. This mode of forcing and raising fluids is also applicable to the supply of water to houses and towns without the aid of steam engines, especially in cases of high service, the apparatus being in each case modified to suit the particular circumstances required to be met. It is likewise applicable to the purpose of raising water to heights for extinguishing fires, and other purposes for which the raising and forcing of water may be required.

It will thus be seen that my Invention supplies the means of abating nuisances, by disinfecting and deodorizing fluid and other matters passing from drains, sewers, and other outlets by means of the above-named acids and alkalies; also that the working of this process or processes results in the production of a triple phosphate applicable to the purposes of manure; also that a source of motive power is developed applicable to the various purposes for

which the raising and forcing of fluid and solid bodies or matters without the aid of pistons, or ordinary steam, gas, or air engines may be required.

Having thus described the nature of my Invention, and in what manner the same is to be performed, I would remark that other acids and carbonates may be employed besides those specified above; also that I do not claim as of my Invention the apparatus and mechanism described otherwise than as applied to the purposes described. But what I claim as of my Invention is, in the first place, the use of acids and carbonates applied to or mixed with the contents of sewers, drains, and other channels for the passage or discharge of refuse matter by means of apparatus and mechanism as described, for the purpose of abating smells.

Secondly, the production and consolidation of a triple phosphate of ammonia and magnesia, applicable to the purposes of manures by the combined use of such chemical substances with the apparatus and mechanism, as described.

And, lastly, the propulsion of fluid and solid matters, so as to raise or force them to convenient heights or distances, and distribute them as may be required by means of a condensible gas or air generated within some of the vessels or condensers, and made to press upon the surface of such matters and force them forwards, or by expanding the elastic lining of such vessels, in the manner described.

In witness whereof, I, the said Sir James Murray, have hereunto set my hand and seal, the Eleventh day of July, in the year of our Lord One thousand eight hundred and fifty-seven.

JAMES MURRAY. (L.S.)

Signed, sealed, and delivered by the above-named Sir James Murray, the word "or" being first interlined between the fourth and fifth [*6th and 7th*] line from the bottom of third [*7th*] page, in presence of us

JAMES DAVOREN, Up^r^ Dominick St., Dublin.
EDWARD MORAN, 45, Wellington Street, Dublin.

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Printers to the Queen's most Excellent Majesty. 1857.