Specification of James Bannehr : supplying deodorizing material to closets and treating liquid excreta.

Contributors

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A.D. 1867, 17th OCTOBER. N° 2918.

SPECIFICATION

OF

JAMES BANNEHR.

SUPPLYING DEODORIZING MATERIAL TO CLOSETS AND TREATING LIQUID EXCRETA.

LONDON:
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A.D. 1867, 17*th* OCTOBER. N° 2918.

Supplying Deodorizing Material to Closets and Treating Liquid Excreta.

LETTERS PATENT to James Bannehr, of the City of Exeter, for the Invention of "IMPROVEMENTS IN APPARATUS FOR SUPPLYING DEODORIZING MATTER TO DRY OR EARTH CLOSETS, AND IN PROCESSES OF AND APPARATUS FOR TREATING THE LIQUID PORTION OF HUMAN OR ANIMAL EXCRETA AFTER REMOVAL FROM SUCH CLOSETS OR FROM OTHER RECEPTACLES."

Sealed the 15th April 1868, and dated the 17th October 1867.

PROVISIONAL SPECIFICATION left by the said James Bannehr at the Office of the Commissioners of Patents, with his Petition, on the 17th October 1867.

I, JAMES BANNEHR, of the City of Exeter, do hereby declare the nature of the said Invention for "IMPROVEMENTS IN APPARATUS FOR SUPPLYING DEODORIZING MATTER TO DRY OR EARTH CLOSETS, AND IN PROCESSES OF AND APPARATUS FOR TREATING THE LIQUID PORTION OF HUMAN OR ANIMAL EXCRETA AFTER REMOVAL FROM SUCH CLOSETS OR FROM OTHER RECEPTACLES," to be as follows:—

The objects of my Invention are, first, the construction of apparatus for supplying a regulated amount of deodorizing matter to dry or earth closets after each occupation or use for the purpose of deodorizing the solid portion of human excreta; and, secondly, certain processes for treating and the construction of apparatus for evaporating the liquid portion of human or animal excreta after its removal from such closets or from other receptacles for the purpose of obtaining an extract possessing great fertilizing properties; the solid and liquid portions of the excreta are received in separate compartments of the

closets, or are otherwise collected separate and apart from each other as far as convenient by separate appliances, and by arrangements well known.

The first part of my Invention is as follows :—It has before been a practice in dry or earth closets to place the deodorizing matter in a hopper behind the seat of the closet provided with a movable bottom, which at one time moves horizontally to allow some of the deodorant to fall upon a shelf below and then at the proper time returns to position. In this return movement of the bottom a brush or scraper fitted to its under side pushes the deodorant from the shelf into the receptacle for the solid excrement. This part of my Invention consists of a new arrangement for moving the hopper bottom and the brush at the proper time. I fit the hinged lid of the closet with a toothed quadrant in gear with a corresponding quadrant on a bar carried out from the hopper bottom; when the lid is lifted by the person about to use the closet the action of the quadrants moves the bar and consequently the hopper bottom and brush or scraper, allowing some of the deodorant to fall upon the shelf; then, when the lid is lowered the reverse movement takes place, that is to say, the bottom of the hopper returns to position, and the brush or scraper at the same time moving forward brushes the deodorant from the shelf into the receptacle.

This part of my Invention further consists in closing the lid of the closet automatically as follows, in order to ensure the supply of the deodorant :— When the door of the closet chamber is opened by the person leaving it cords, rods, or other connecting appliances leading from the door to the back of the closet in connection with the lid, cause an arm to project and push forward the lid beyond the vertical position so that it falls upon the seat, closing the opening above the receptacle; the same cords, rods, or appliances may also be made to release a catch when such is fitted to hold the lid when fully opened.

The second part of my Invention is as follows :—The urine or liquid portion of human or animal excreta after being removed from the dry closets or from other receptacles of a suitable construction for collecting it apart from the fœces, and after having been allowed to decompose either in these receptacles or otherwise, is mixed with an agent, such as sulphuric acid, or hydrochloric acid, in order to fix the ammonia resulting from its decomposition; or instead of allowing the urine to decompose previous to applying an agent for fixing the ammonia resulting from its decomposition I allow it to decompose in combination with any of the salts of lime, but preferably sulphate of lime, for fixing or combining with the ammonia which results from the decomposition of the urine, about 5 to 10 per cent. of sulphate of lime is a suitable pro-

portion. In order to facilitate the decomposition, and the chemical change resulting from the addition of an agent for fixing the ammonia, I convey through a suitable channel a current of atmospheric air by preference warmed and charged with a current of electricity, or with carbonic acid produced by the combination of sulphuric acid with carbonate of lime, or otherwise, passing beneath the surface of the urine whilst undergoing decomposition. And in order that such air may pass out of the chamber containing the decomposing urine I provide a separate chamber, which I connect with the decomposing chamber by a pipe or other suitable channel, placing in such separate chamber granules of charcoal or other deodorant which I charge with sulphuric or other acid for arresting the ammonia which might otherwise pass from the decomposing chamber with the air, the escaping air first passing through or between such granules of acidulated charcoal or other deodorant before escaping into the outer atmosphere. When such deodorant is fully charged with ammonia or with offensive odour I incorporate it with the manurial matter hereafter described. When treating urine in combination with salts of lime I provide the decomposing chamber with a suitable apparatus for occasionally agitating the combined matters. The liquid mixture is then supplied continuously or intermittently, and preferably in a state of spray, to evaporating apparatus constructed as follows, this apparatus constituting part of my Invention:—It consists of a long shallow enclosed vessel through which a strong draught of air is forced by a fan or other suitable blowing apparatus, the air being heated before entering the vessel by passing through a chamber containing a coil or set of pipes supplied with either waste steam, hot water, or hot air. To prevent the air passing direct through the enclosed vessel and to cause it to impinge upon the bottom thereof, I fit at intervals across the vessel plates or vanes hung from pivots and counterbalanced or nearly so by weights. The liquid supplied to the vessel is evaporated by the draught of air, a solid manurial extract having great fertilizing properties being thus deposited upon the bottom, while the moistened air is carried off from the further end of the vessel through a channel which is preferably led to the furnace in order that the air which will have a disagreeable odour may be consumed therein; an additional fire-place may be employed if necessary to assist in consuming the offensive moistened air passing from the evaporating chamber. Sometimes I fit a coil or set of pipes in the channel and pass cold air or water through them to cool the foul air. To facilitate the evaporation in the enclosed chamber I lead the products of combustion from the furnace, or some of them, through a pipe extending longitudinally through the vessel, and then through

a connecting piece into and through another pipe carried through the vessel in the opposite direction. The liquid may be supplied to the vessel by a pipe leading through it and formed with numerous small orifices. When the solid matter has accumulated the cover of the vessel is taken off and the solid matter removed.

The second part of my Invention further consists in the following combination of parts for evaporating the urine or liquid excreta mixed with a fixing agent as before mentioned:—I mount a hollow cylinder, plain internally, in such manner that rotary motion may be imparted thereto; I supply it with the urine preferably in a state of spray, and I carry through it longitudinally a pipe closed towards the far end and formed for the greater part of its length with small orifices to allow of air forced into such pipe to be discharged into and to impinge on the greater part of the interior of the cylinder. In communication with such perforated pipe is a fan or blowing apparatus. The current of air from the fan issues through the orifices of the pipe into the rotating cylinder, evaporates the liquid therein, and the moistened air is carried off from the further end of the cylinder to a fire-place or purifying condenser. The liquid may be supplied to the cylinder by the perforated pipe or otherwise. A portion of the end of the cylinder is made removable to allow the solid deposit to be removed when it has accumulated sufficiently to require it; or I construct the cylinder in two parts so as to open longitudinally on hinges, or otherwise to allow the accumulated contents to be removed.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said James Bannehr in the Great Seal Patent Office on the 17th April 1868.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, James Bannehr, of the City of Exeter, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Seventeenth day of October, in the year of our Lord One thousand eight hundred and sixty-seven, in the thirty-first year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said James Bannehr, Her special licence that I, the said James Bannehr, my executors, administrators, and assigns, or such others as I, the said James Bannehr, 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 "IMPROVEMENTS IN APPARATUS FOR SUPPLYING DEODORIZING MATTER TO DRY OR EARTH CLOSETS, AND IN PROCESSES OF AND APPARATUS FOR TREATING THE LIQUID PORTION OF HUMAN OR ANIMAL EXCRETA AFTER REMOVAL FROM SUCH CLOSETS OR FROM OTHER RECEPTACLES," upon the condition (amongst others) that I, the said James Bannehr, 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 months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said James Bannehr, 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 thereof, reference being had to the Drawings hereunto annexed, that is to say:—

The objects of my Invention are, 1st, the construction of apparatus for supplying a regulated amount of deodorizing matter to dry or earth closets after each occupation or use for the purpose of deodorizing human excreta; and, 2ndly, certain processes for treating, and the construction of apparatus for evaporating the liquid portion of human or animal excreta after its removal from such closets or from other receptacles for the purpose of obtaining an extract possessing great fertilizing properties. The solid and liquid portions of the excreta are received in separate compartments of the closets, or are otherwise collected separate and apart from each other as far as convenient by separate appliances and by arrangements well known.

The first part of my Invention is as follows:—It has before been a practice in dry or earth closets to place the deodorizing matter in a hopper behind the seat of the closet, provided with a movable bottom, which at one time moves horizontally to allow some of the deodorant to fall upon a shelf below, and then at the proper time returns to position. In this return movement of the bottom a brush or scraper fitted to its under side pushes the deodorant from the shelf into the receptacle for the excreta.

A dry or earth closet is represented in vertical section in Figure 1, which is taken through the line 1, 2, of Figure 2; Figures 2 and 3 are plan views respectively showing the bottom of the hopper in its back and front positions.

a is the seat of the closet; *b*, the hinged lid; *c*, the hopper; *d*, the hopper bottom; *e*, the brush fitted to the under side of the bottom *d*; and *f*, the shelf below the hopper on to which the deodorant falls ready to be pushed into the receptacle *g* for the excreta. This part of my Invention consists of a new arrangement for moving the hopper bottom *d* and the brush or scraper *e* at the proper time. I fit the hinged lid *b* with a toothed quadrant *h* in gear with a curved rack *i* on a bar *k* carried out from the hopper bottom *d*. When the lid *b* is lifted by the person about to use the closet, the action of the quadrant *h* and rack *i* moves back the bar *k*, and consequently the hopper bottom *d* and brush *e*, allowing some of the deodorant to fall upon the shelf *f*; then when the lid *b* is lowered the reverse movement takes place, that is to say, the hopper bottom *d* returns to position, and the brush or scraper *e* at the same time moving forward brushes the deodorant from the shelf *f* into the receptacle *g*. In some cases it may be convenient to form the receptacle *g* with a false bottom, which may be occasionally moved back to allow the contents to fall into the lower part of the receptacle or into a separate receptacle below; this may be effected by hinging the seat *a* and connecting a quadrant thereto, which by suitable connections may be made to move back the false bottom when the seat is raised, and to return the false bottom to position when the seat is again closed.

This part of my Invention further consists in closing the lid *b* of the closet automatically, as follows, in order to ensure the supply of the deodorant:—When the door of the closet chamber is opened by the person leaving it, cords, rods, or other connecting appliances, as indicated at *l*, Figure 4, leading from the door to the back of the closet in connection with the lid *b* cause an arm *m* to project and push forward the lid beyond the vertical position so that it falls upon the seat *a*, closing the opening above the receptacle; the same cords, rods, or appliances may also be made to release a catch *n* when such is fitted to hold the lid when fully opened.

The second part of my Invention is as follows:—The urine or liquid portion of human or animal excreta, after being removed from the dry closet or from other receptacles of a suitable construction for collecting it apart from the fœces, and after having been allowed to decompose either in these receptacles or otherwise, is mixed with an agent such as sulphuric acid or hydrochloric acid in order to fix the ammonia resulting from its decomposition; or instead of allowing the urine to decompose, previous to applying an agent for fixing the ammonia resulting from its decomposition, I allow it to decompose in combination with any of the salts of lime, but preferably sulphate of lime, for fixing or combining with the ammonia which results from the decomposition

of the urine, about 5 to 10 per cent. of sulphate of lime is a suitable proportion. In order to facilitate the decomposition, and the chemical change resulting from the addition of an agent for fixing the ammonia, I convey through a suitable channel a current of atmospheric air, by preference warmed and charged with a current of electricity or with carbonic acid produced by the combination of sulphuric acid with carbonate of lime or otherwise passing beneath the surface of the urine whilst undergoing decomposition. And in order that such air may pass out of the chamber containing the decomposing urine, I provide a separate chamber which I connect with the decomposing chamber by a pipe or other suitable channel, placing in such separate chamber granules of charcoal or other deodorant, which I charge with sulphuric or other acid for arresting the ammonia which might otherwise pass from the decomposing chamber with the air, the escaping air first passing through or between such granules of acidulated charcoal or other deodorant before escaping into the outer atmosphere; when such deodorant is fully charged with ammonia or with offensive odour, I incorporate it with the manurial matter hereafter described.

When treating urine in combination with salts of lime, I provide the decomposing chamber with a suitable apparatus for occasionally agitating the combined matters. The liquid mixture is then supplied continuously or intermittently, and preferably in a divided state or in a state of spray, to evaporating apparatus constructed as follows, this apparatus constituting part of my Invention. It is represented in top view with the cover removed, in Figure 5; in vertical section in Figure 6, through the line 1, 1, of Figure 5; and also in vertical section in Figure 7, through the line 2, 2, of Figure 5. It consists of a long shallow enclosed vessel *a*, through which a strong draught of air is forced by a fan or other suitable blowing apparatus, the air being heated before entering the vessel by passing through a chamber *b* containing a coil or set of pipes *c* supplied with either waste steam, hot water, or hot air; *d* represents the inlet of air from the blowing apparatus to the chamber *b*; *e* is the inlet, and *f* the outlet for the steam, hot water, or hot air. When steam is employed it becomes condensed in the pipes *c*, and may be returned to the boiler. The air passes from the chamber *b* to the evaporating vessel *a* through an opening in the partition *g*. To prevent the air passing direct through the enclosed vessel *a*, and to cause it to impinge upon the bottom thereof, I fit at intervals across the vessel plates or vanes *h* hung from pivots at *i*, and counterbalanced or nearly so by weights. The liquid supplied to the vessel is evaporated by the draught of air, a solid manurial extract having great fertilizing properties being thus deposited, while the moistened air is

carried off from the further end of the vessel through a channel *k*, which is preferably led to the furnace, in order that the air which will have a disagreeable odour may be consumed therein; an additional fire-place may be employed if necessary to assist in consuming the offensive moistened air passing from the evaporating chamber. Sometimes I fit a coil or set of pipes *l* in the channel *k*, and pass cold air or water through them to cool the foul air. To facilitate the evaporation in the enclosed chamber *a*, I lead the products of combustion from the furnace or some of them through a pipe *m*, extending longitudinally through the vessel, and then through a connecting piece *n* into and through another pipe *o* carried through the vessel in the opposite direction. The liquid may be supplied to the vessel by a pipe leading through it, and formed with numerous small orifices; but I prefer to supply it through pipes *p* carried along the top of the vanes *h*, and formed with orifices through which the liquid issues so as to trickle or run down the face of these vanes and allow the current of air to come against it; the vanes have slots or openings to fit over the pipes *m* and *o*. When the solid matter has accumulated the cover of the vessel *a* is taken off and the solid matter removed, or the top of the vessel may be provided with a man-hole between every two vanes, as shown. *q* is a drying chamber or floor for drying and storing the collected deposit from the evaporating chamber.

The second part of my Invention further consists in the following combination of parts for evaporating the urine or liquid excreta mixed with a fixing agent, as before mentioned. I mount a hollow cylinder, plain internally, in such manner that rotary motion may be imparted thereto. Figure 8 represents at A such a cylinder in longitudinal section, and Figure 9 in end view. I supply it with the urine, preferably in a state of spray, by a pipe B, and I carry through it longitudinally a pipe C closed towards the far end at D, and formed for the greater part of its length with small orifices E, E, to allow of air forced into such pipe to be discharged into and to impinge on the greater part of the interior of the cylinder A. In communication with such perforated pipe C is a fan or blowing apparatus. The current of air from the fan issues through the orifices E, E, of the pipe into the rotating cylinder, evaporates the liquid therein, and the moistened air is carried off from the further end of the cylinder through the portion of the pipe C beyond the division D, this portion being formed with holes F, F, to a fire-place or purifying condenser. The liquid may be supplied to the cylinder by the perforated pipe C, but I prefer the separate pipe B, as described, through which the liquid is forced intermittently or continuously by steam pressure or otherwise. A portion of the end of the cylinder may be made removable, as shown

at H, Figure 8, to allow the solid deposit to be removed when it has accumulated sufficiently to require it; or man-holes may be provided in the sides of the cylinder for this purpose; or I construct the cylinder in two parts so as to open longitudinally on hinges, as shewn at G, Figure 9, or otherwise to allow the accumulated contents to be removed.

In witness whereof, I, the said James Bannehr, have hereunto set my hand and seal, this Fifteenth day of April, One thousand eight hundred and sixty-eight.

JAMES BANNEHR. (L.S.)

LONDON:
Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1868.

A.D. 1867, Oct. 17. N° 2918.
BANNEHR'S Specification.

[1 SHEET]

FIG. 1.

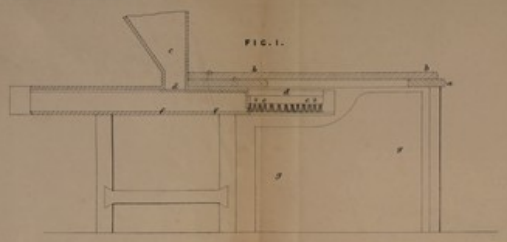


FIG. 2.

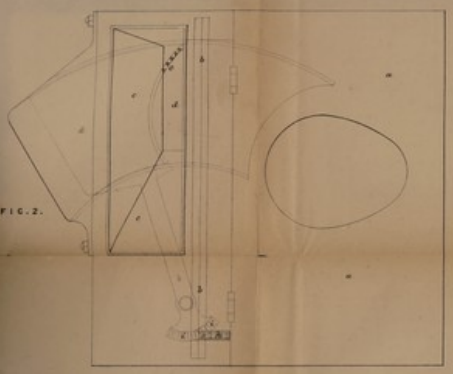


FIG. 3.

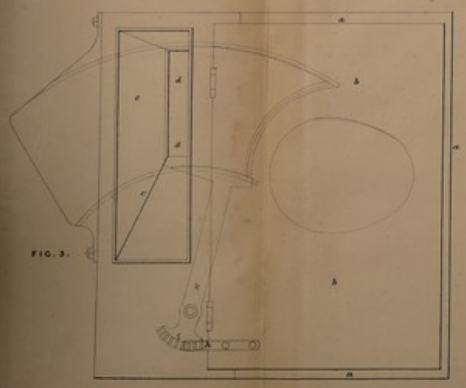


FIG. 4.

FIG. 5.

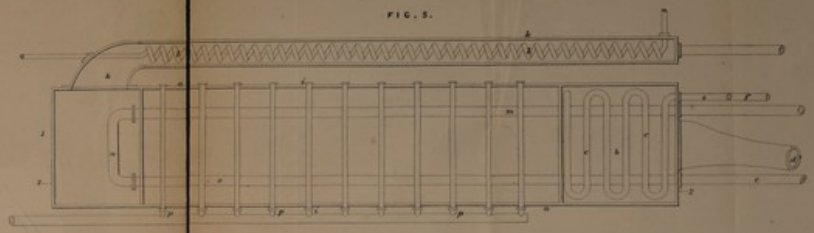


FIG. 6.

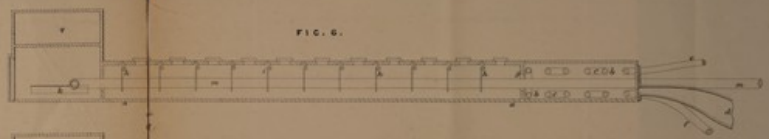
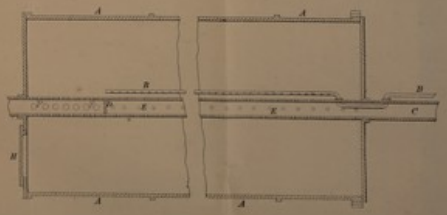


FIG. 7.

FIG. 9.

FIG. 8.



The filed drawing is not colored.

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Printers to the Queen's most Excellent Majesty. 1868.

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