

Specification of Josiah George Jennings : treating sewage and irrigating land.

Contributors

Jennings, Josiah George.

Publication/Creation

London : Great Seal Patent Office, 1869 (London : George E. Eyre and William Spottiswoode)

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A.D. 1868, 22nd DECEMBER. N° 3914.

SPECIFICATION

OF

JOSIAH GEORGE JENNINGS.

TREATING SEWAGE AND IRRIGATING LAND.

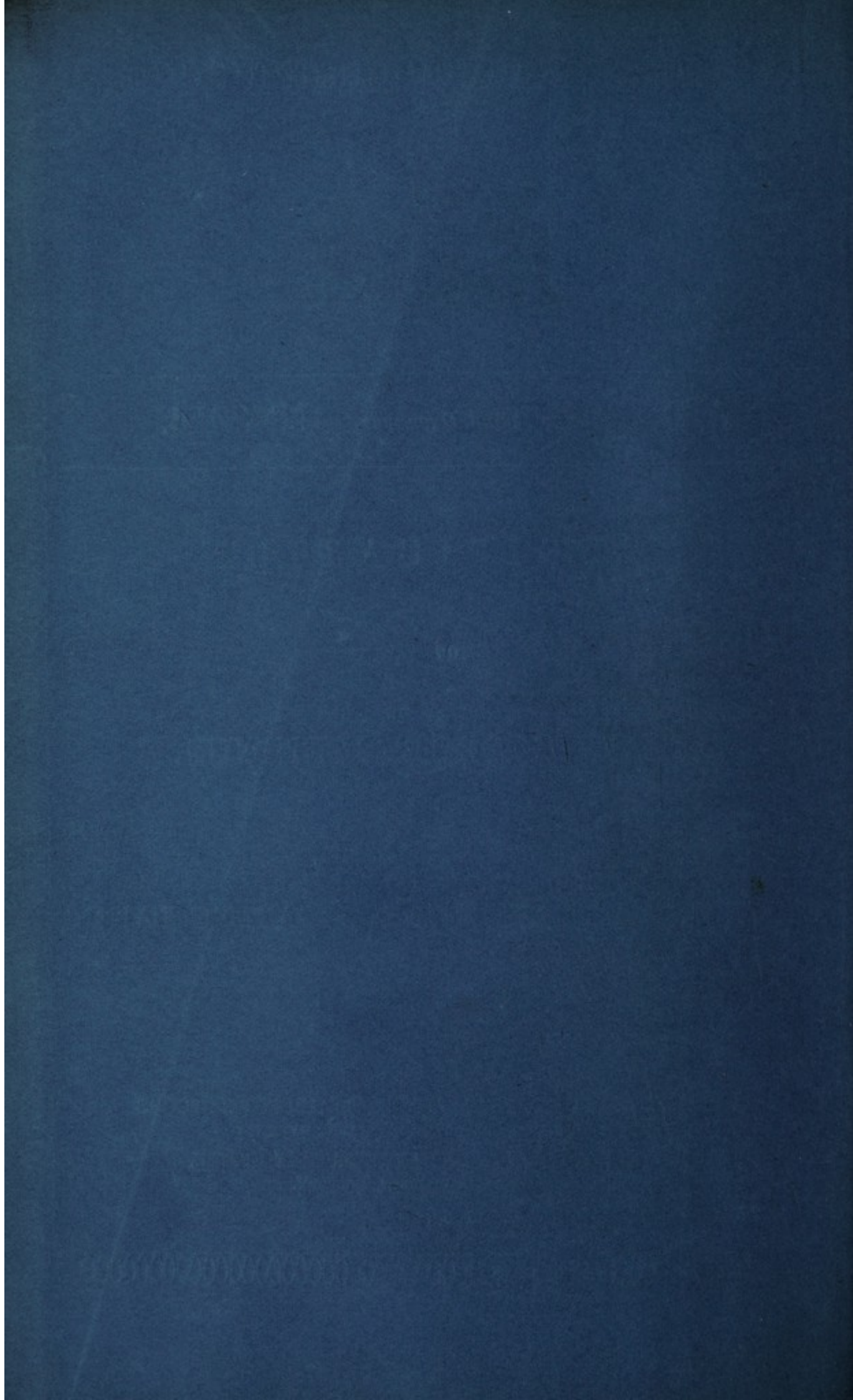
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PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY:

PUBLISHED AT THE GREAT SEAL PATENT OFFICE,
25, SOUTHAMPTON BUILDINGS, HOLBORN.

Price 1s. 2d.

1869.





A.D. 1868, 22nd DECEMBER. N^o 3914.

Treating Sewage and Irrigating Land.

LETTERS PATENT to Josiah George Jennings, of Palace Wharf, Lambeth, in the County of Surrey, Sanitary Engineer, for the Invention of "**IMPROVEMENTS IN APPARATUS FOR TREATING SEWAGE AND FOR IRRIGATING LAND WITH SEWAGE AND OTHER WATERS.**"

Scaled the 18th June 1869, and dated the 22nd December 1868.

PROVISIONAL SPECIFICATION left by the said Josiah George Jennings at the Office of the Commissioners of Patents, with his Petition, on the 22nd December 1868.

I, JOSIAH GEORGE JENNINGS, of Palace Wharf, Lambeth, in the
5 County of Surrey, Sanitary Engineer, do hereby declare the nature of the said Invention for "**IMPROVEMENTS IN APPARATUS FOR TREATING SEWAGE AND FOR IRRIGATING LAND WITH SEWAGE AND OTHER WATERS,**" to be as follows:—

This Invention has for its object improvements in apparatus for
10 treating sewage and for irrigating land with sewage and other waters.

In order to separate from sewage stones and other masses of solid matter which it brings down with it I employ a hollow rotating screen of conical or other form, into the interior of which the sewage is directed.

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The sewage in entering the screen is made to act on a water wheel or on float boards or similar instruments on its axis, and so the screen is rotated. The sewage runs through the sides of the screen and is received into a trough below, whilst the stones and solid matters are discharged at the end of the screen into a cart or other receptacle. A shaking motion 5 is given to the screen as it revolves to shake out any solid matters which may stick in the straining surface; for this purpose cams are fixed on the axis, which as the axis revolves alternately lift it and allow it to drop. In place of driving the screen, as above described, it may be driven by other power. In some cases I employ a screen formed by 10 jointing together a number of bars so as to form an endless straining surface. This endless surface is passed around rollers and held distended between them. The sewage is let on to the surface as it slowly travels around the rollers, the liquid flows through and is received into a trough on the other side, whilst the solid matters are carried along and dis- 15 charged over the rollers as the bars pass around it. The passage over the rollers tends to free the straining surface from obstructions.

In order to irrigate land with sewage or other water earthenware troughs or gutters are now sometimes used, they are laid in the land with the lips or edges of the troughs or gutters about level with the 20 surface in order that the sewage may flow over the sides of the trough equally on both sides. In practice such gutters or troughs cannot be laid sufficiently true to ensure an overflow on both sides simultaneously, because the overflow lips being at the full width of the trough, the one from the other, any inaccuracy in laying seriously affects the relative 25 levels of the overflow lips.

According to my Invention I make the sides of the trough or gutter approach each other until the opening at the top between the lips is very narrow, say, about half an inch wide, whilst below the trough is several inches wide. With troughs or gutters thus constructed a slight in- 30 accuracy in the laying will have an inappreciable effect on the direction in which the stream escapes from the lips. In order to strengthen the lips I thicken them and form them hollow, and I use these hollow lips to receive dowels to connect the troughs or gutters the one to the other. I make the bottoms of the troughs or gutters flat, that they may stand 35 the more truly on the bottom of the shallow trench which is cut to receive them. In order to stop the flow through the troughs or gutters so as to make the sewage escape at any desired point I employ a wooden

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disc with a handle to it; it is inserted between the lips, and has a stud or slight projection at the bottom. Recesses are formed in the bottoms of the troughs or gutters at intervals, and the stud or projection on the disc is dropped into one of them, the disc is then turned round so as to stop the channel, and its handle enters notches cut out for it in the lips on either side, so the disc becomes securely held in its place. In place of making the gutters or troughs in the manner above described they may, but less advantageously, be plain tubes with a narrow slit or slits along the top. The gutters or troughs may also be made in wood. Where a stop valve is required to direct the flow into one or other of several gutters or troughs I employ a cylinder of earthenware set upright in the ground, and the several gutters or troughs enter around it. Into the cylinder a wooden slide descends; it is of a width equal to the diameter of the cylinder, and when it is inserted it divides one-half of it with the gutters or troughs in connection therewith from the other half with its gutters or troughs. There are guides for the slide within the cylinder, and they are so arranged that the slide can be inserted in two or more different positions. The same guides also serve to receive other slides, by means of which any one of the several gutters or troughs opening into the cylinder may be closed. The cylinder is made by pressing clay through a suitable die, then cutting it off in lengths, and adapting the junctions and bottom. At the entrance to each gutter or trough or system of gutters or troughs I employ a sluice valve consisting of an earthenware pipe with a chamber open at the top formed in it. To shut off the flow a flat board is inserted into this chamber so as to act as a valve, and it is held up to its face by a turnbutton or by wedges behind it. The flow can be regulated as may be required by raising the board valve more or less, and locking it in the required position by the turnbutton or wedges. Where fences are required I make the top rail of the fence a metal pipe of wrought or cast iron connected up with water-tight joints, and I screw or otherwise fix the pipes into sockets on the posts, where I provide suitable draw-off valves. I also adapt the posts to receive and strain wire to complete the fence; or in place of drawing off the water or other liquid at the posts T pieces may be inserted in the pipe at intervals; they receive caps or are otherwise closed when it is not required to draw off through them.

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SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Josiah George Jennings in the Great Seal Patent Office on the 22nd June 1869.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JOSIAH GEORGE JENNINGS, of Palace Wharf, Lambeth, in the County of Surrey, 5 Sanitary Engineer, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twenty-second day of December, in the year of our Lord One thousand eight hundred and sixty-eight, in the thirty-second year of Her reign, did, for Herself, Her heirs and 10 successors, give and grant unto me, the said Josiah George Jennings, Her special licence, that I, the said Josiah George Jennings, my executors, administrators, and assigns, or such others as I, the said Josiah George Jennings, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and 15 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 TREATING SEWAGE AND FOR IRRIGATING LAND WITH SEWAGE AND OTHER WATERS,**" upon the condition 20 (amongst others) that I, the said Josiah George Jennings, 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 25 Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Josiah George Jennings, do hereby declare the nature of the said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and 30 by the following statement thereof, that is to say:—

This Invention has for its object improvements in apparatus for treating sewage and for irrigating land with sewage and other waters. 35

In order to separate from sewage stones and other masses of solid matter which it brings down with it I employ a hollow rotating screen 35 of conical or other form, into the interior of which the sewage is directed. The sewage in entering the screen is made to act on a water wheel or on

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float boards or similar instruments on its axis, and so the screen is rotated. The sewage enters the screen at one of its ends and runs through its sides, and is received into a trough below, whilst the stones and solid matters are discharged at the opposite end of the screen into
5 a cart or other receptacle. In place of driving the screen as above described by a water wheel acted upon by the sewage before it enters the screen the power for driving the screen might be obtained by causing the sewage as it flows away after passing through the screen to drive a water wheel, or the screen may be driven by other power. In some cases
10 I employ a screen formed by jointing together a number of bars so as to form an endless straining surface. This endless surface is passed around rollers and held distended between them. The sewage is let on to the surface as it slowly travels around the rollers, the liquid flows through and is received into a trough on the other side, whilst the solid matters
15 are carried along and discharged over the roller as the bars pass around it. The passage over the rollers tends to free the straining surface from obstructions.

In Figure 1 of the Drawings hereunto annexed I have shown an arrangement such as is above described.

20 *a, a*, is the endless straining surface composed of iron bars jointed together to form a chain in a similar manner to that employed for forming the endless chain of furnace bars for what is known as a Juckes' furnace. The sewage passes on to these bars from the outlet of the sewer *b*, the liquid portion of the sewage falls down between the bars of
25 the chain *a*, and in flowing away it drives a water wheel *c*, from which a slow revolving motion may be given to one of the rollers upon which the chain *a* is supported. If more water is coming down through the screen than can pass away below the wheel the excess can flow off over the guard plate *c'* with which the wheel *c* is covered over. The solid
30 matters which are arrested by the travelling screening surface *a* are discharged from it on to the shoot *d*.

I would remark that I do not confine myself to the exact arrangements shown by the Drawings as other arrangements may be adopted for screening sewage by passing it on to a travelling screening surface.

35 In order to irrigate land with sewage or other water earthenware troughs or gutters are now sometimes used; they are laid in the land with the lips or edges of the troughs or gutters about level with the surface in order that the sewage may flow over the sides of the trough

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equally on both sides. In practice such gutters or troughs cannot be laid sufficiently true to ensure an overflow on both sides simultaneously, because the overflow lips being at the full width of the trough the one from the other, so that any inaccuracy in the laying seriously affects the relative levels of the overflow lips. 5

According to my Invention I make the sides of the trough or gutter approach each other until the opening at the top between the lips is very narrow, say, about half an inch wide, whilst below the trough is several inches wide. With troughs or gutters thus constructed a slight inaccuracy in the laying will have an inappreciable effect on the direction 10 in which the steam escapes from the lips. In order to strengthen the lips I thicken them and form them hollow, and I use these hollow lips to receive dowels to connect the troughs or gutters the one to the other. I make the bottoms of the troughs or gutters flat that they may stand the more truly on the bottom of the shallow trench which is cut to 15 receive them.

Figures 2 and 3 show respectively a side view and end view of a distributing trough or gutter such as is above described. Such troughs or gutters may be made to any desired size, either for conveying a large or small quantity of sewage. The hollow thickened lips for receiving 20 dowels are clearly shown by the Drawings. In order to prevent earthenware troughs, such as shown by the Drawings, from warping when being burnt I prefer to mould them with a thin web connecting together their two lips, as shown by the Drawings in red lines; this web can readily be broken away after the troughs have been baked. In place of making 25 the gutters or troughs in the manner above described they may, but less advantageously, be plain tubes with a narrow slit or slits along the top. The gutters or troughs may also be made in wood; in this case I form the gutters or troughs somewhat of a triangular form, as shown at Figure 4, the two sides of the trough being inclined towards one another 30 until they nearly meet, only sufficient opening being left between them to allow the required quantity of sewage to flow away between them; these inclined sides may be connected to one another at intervals by ties so as to give strength. When a stop valve is required to direct the flow into one or other of several gutters or troughs I employ a cylinder or 35 chamber of earthenware set upright in the ground, and the several gutters or troughs enter around it. Into the cylinder or chamber a wooden slide descends, it is of a width equal to the diameter of the cylinder

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or chamber, and when it is inserted it divides the inlet gutter or trough from the outlet gutters or troughs in connection therewith; other similar wooden slides are employed to govern the outflow through the outlet gutters or troughs; guides are provided for the sliders within the
5 cylinder or chamber. The cylinder or chamber is made by pressing clay through a suitable die, then cutting it off in lengths and adapting to them the junctions and bottom.

Figures 5, 6, 7, and 8 show various views of a stop valve, such as is above described, formed to receive one inlet gutter or trough and one
10 outlet gutter or trough.

a is the chamber or case into and from which the distributing gutters or troughs lead, sockets being formed for the ends of the gutters or troughs to rest in, as shewn; *b* is the trough through which sewage is led into the chamber *a*; and *c* is the outlet gutter or trough which passes
15 from the chamber *a* at a lower level than the level at which the trough *b* enters; *d* is a wooden slide which may be used either for closing the end of the inlet or the outlet trough. If the passing away of sewage from the inlet pipe *b* through the outlet pipe *c* is arrested by the wooden slide *d* the sewage will escape through the open top of the inlet pipe *b*
20 and will irrigate the land through which it is led, but if the slide *d* be raised the sewage in place of being thus forced to escape from the open top of the pipe *b* can pass freely from the inlet pipe *b* to the outlet pipe *c*. In place of the stop valve being formed with one outlet trough only, as shown by the above Figures, it may be formed with a greater
25 number of outlet troughs, as shown in plan view at Figure 9. In this case each of the outlet troughs should pass from the chamber *a* at a lower level than that at which the inlet trough enters the chamber. It is not necessary that all the outlet passages should be at the same level, as they might be led at different levels from the chamber *a* to suit the
30 formation of the land to be irrigated. The entrance of sewage into the case *a*, and the passing away of sewage through each of the outlet passages can be governed by wooden slides, which can be dropped down between the diagonal guides *e* so as to come in front of the inlet and outlet passages. At the entrance to each gutter or trough, or system of
35 gutters or troughs, as it branches out from a main channel or sewer through which the sewage is led I employ a sluice valve consisting of an earthenware pipe with a chamber open at the top formed in it. To shut off the flow a flat board is inserted into this chamber so as to act as a

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valve, and it is held up to its face by a turnbutton or by wedges behind it. The flow can be regulated as may be required by raising the board valve more or less and locking it in the required position by the turnbutton or wedges.

Figures 10, 11, 12, and 13 show various views of an earthenware sluice valve constructed as above described.

a is the valve chamber, open at the top to allow of the wooden slide *b* being dropped down into it; *c, c*, are the wedges for retaining the board at any desired height, so as either entirely to close the passage through the pipe or to allow any desired quantity of sewage to flow through it. Where fences are required I make the top rail of the fence a metal pipe of wrought or cast iron connected up with water-tight joints, and I screw or otherwise fix the pipes into sockets on the posts, where I provide suitable draw-off valves; I also adapt the posts to receive and strain wire to complete the fence; or in place of drawing off the water or other liquid at the posts T pieces may be inserted in the pipe at intervals; they receive caps or are otherwise closed when it is not required to draw off through them. In this latter case the pipes instead of screwing into sockets on the posts may simply be passed through holes formed through the posts, shown at Figure 14 of the Drawings, and be connected up to one another by screw joints into one continuous rail.

In witness whereof, I, the said Josiah George Jennings, have hereunto set my hand and seal, this Twenty-second day of June, in the year of our Lord One thousand eight hundred and sixty-nine.

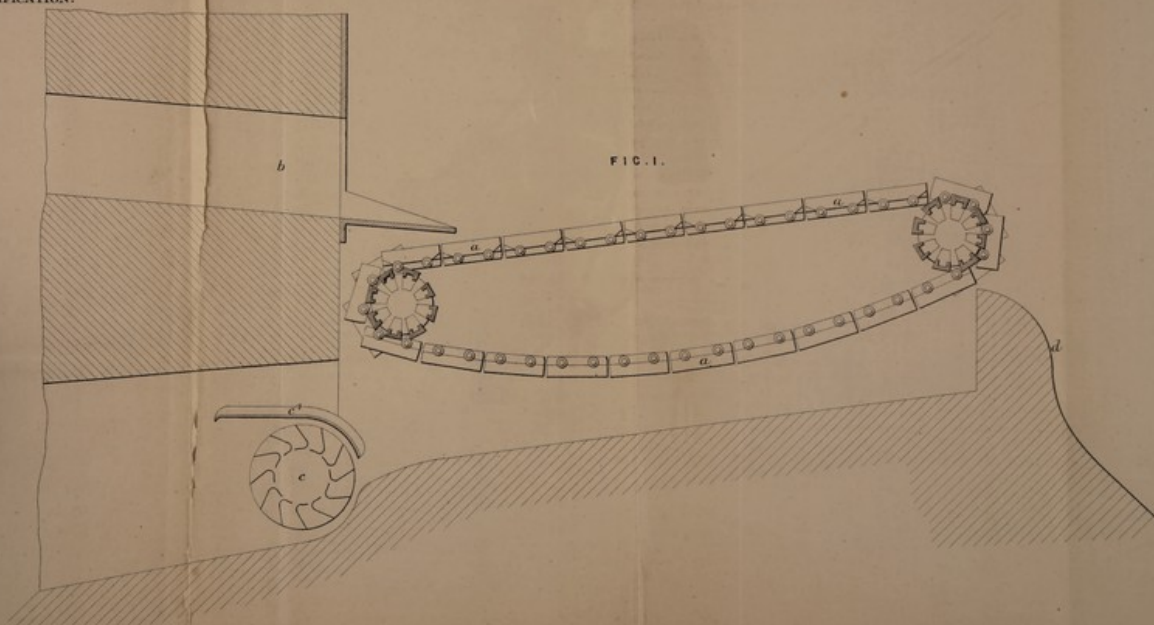
GEORGE JENNINGS. (L.S.)

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AD.1868, DEC.22, N° 3914.
JENNINGS' SPECIFICATION.

(2 SHEETS)
SHEET 1



The filed drawing is not colored.

Drawn on Stone by Malby & Sons.

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FIG. 5.

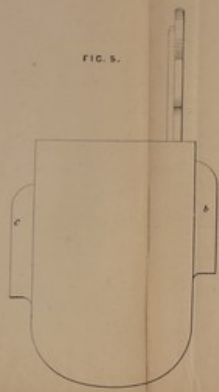


FIG. 7.

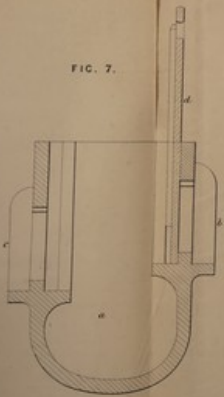


FIG. 6.

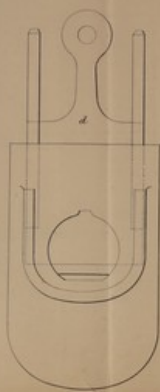


FIG. 4.

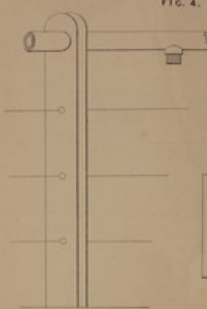


FIG. 9.

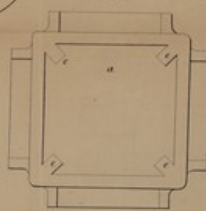


FIG. 10.

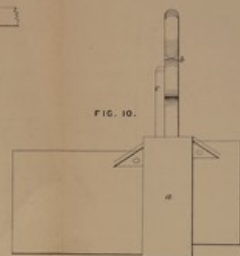


FIG. 11.



FIG. 13.

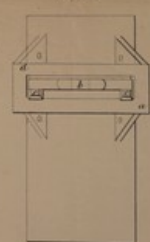


FIG. 12.

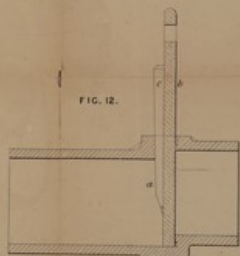


FIG. 4.



FIG. 3.



FIG. 2.

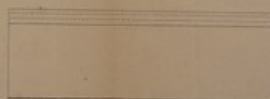
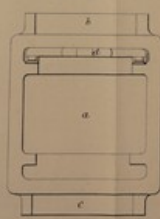


FIG. 8.



that drawing is partly altered.

