

Specification of Baldwin Latham : filtering and straining sewage, &c.;

Contributors

Latham, Baldwin.

Publication/Creation

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

Persistent URL

<https://wellcomecollection.org/works/vasqtf9f>

License and attribution

This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.



Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>



A.D. 1869, 17th *MARCH*. N° 809.

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

OF

BALDWIN LATHAM.

FILTERING AND STRAINING SEWAGE, &c.

LONDON:

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY:

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

Price 1s. 4d.

1869.



A.D. 1869, 17th MARCH. N° 809.

Filtering and Straining Sewage, &c.

LETTERS PATENT to Baldwin Latham, of No. 6, Westminster Chambers, Victoria Street, Westminster, in the County of Middlesex, for the Invention of "**IMPROVEMENTS IN THE MEANS AND MACHINERY OR APPLIANCES FOR FILTERING AND STRAINING LIQUIDS, ESPECIALLY APPLICABLE FOR STRAINING SEWAGE.**"

Sealed the 13th July 1869, and dated the 17th March 1869.

PROVISIONAL SPECIFICATION left by the said Baldwin Latham at the Office of the Commissioners of Patents, with his Petition, on the 17th March 1869.

I, **BALDWIN LATHAM**, of No. 6, Westminster Chambers, Victoria
5 Street, Westminster, in the County of Middlesex, do hereby declare
the nature of the said Invention for "**IMPROVEMENTS IN THE MEANS AND
MACHINERY OR APPLIANCES FOR FILTERING AND STRAINING LIQUIDS, ESPECIALLY
APPLICABLE FOR STRAINING SEWAGE,**" to be as follows :—

My Invention consists in causing the sewage or other fluid to be
10 filtered to pass on its way along or as it issues from a conduit, against
and through a travelling screen or sieve or combination of screening

Latham's Improvements in Filtering and Straining Sewage, &c.

surfaces arranged at right angles or at any other convenient angle to the flow of the fluid, whereby the sewage or other fluid as it passes through the screening surfaces deposits its solid matter upon the latter, which in travelling along carries such matter away to a point where it is removed from the surfaces, and these then again pass into the stream 5 of sewage to intercept fresh matter.

A variety of arrangements of apparatus or machinery may be employed for carrying my Invention into practice. Thus, in one arrangement the travelling screen may be in form of a hollow wheel or drum, either cylindrical or polygonal, rotating on a central shaft, the one end surface 10 of which drum is formed as a screen, while the other end surface is open for the sewage to enter it, and radially or obliquely in the drum are arranged a number of other screens revolving with the drum, upon which screens as also on the screening end surface, the solid matter of the sewage is deposited as they pass through the latter. As these 15 screening surfaces pass round the solid matter falls off them into a semicircular trough partly surrounding the central shaft, and in order to clear the screening surfaces more effectually from the adhering solid matter, brushes or scrapers are arranged at one or more places above the level of the fluid acting against the end screening surface so as to 20 remove the deposited matter therefrom, or a jet of water may be employed for this purpose; also at the circumference of the drum or wheel troughs may be arranged running parallel with the axis of the drum, in which troughs some of the fluid may be caught up, and when raised to a certain height such fluid is made to flow on to the radial screens and 25 to wash the deposited solid matter therefrom into the before-mentioned trough or receptacle partly surrounding the shaft of the drum. To facilitate this the said screens may be constructed of parallel transverse bars placed at such an angle that when raised into the position in which the fluid falls upon them from the troughs they are in a more or less 30 horizontal position. Upon the shaft of the drum may be fixed an archimedian screw, which in revolving in the before-mentioned trough conveys the deposited matter to one end, where it is made to pass through an opening into another trough or channel for conveying it to wherever required, and in which another revolving screw or other known 35 contrivance may be arranged for facilitating its conveyance. The drum or wheel may also be divided by partitions (either constituting screens or otherwise) parallel with the end surfaces into two or more com-

Latham's Improvements in Filtering and Straining Sewage, &c.

partments having screening surfaces of different fineness, so as to sort the solid matter in correspondingly different degrees of fineness, or two or more separate screening wheels or drums of different degrees of screening power may be arranged behind each other, revolving
5 either upon the same shaft or on different shafts and either at the same or at different speeds. In some cases the radial screens may be dispensed with and a fixed brush or scraper may be used, which shall brush or scrape the inner end face of the perforated wheel, and in connection with the brush or scraper a trough may be used for
10 conveying the matter either into the central trough of the wheel or to the exterior of the wheel. Also in place of a wheel or drum a simple disc with or without radial screens may be employed. In some cases the outer face of the wheel may be wholly or partly closed, and perforations may be made in the skin or sole plate of the wheel, which
15 openings will be so arranged as to be protected by the gratings of the screens fixed in the interior of the wheel. Or in some cases the sole plate may be made perforated in the manner described for the end surface of the wheel. The wheel may have a shrouding either solid or perforated, or a combination of both. The motive power when water
20 or other fluid is being treated may be applied direct to the shaft of the apparatus by fixing thereon a water wheel of any known description applicable for the purpose, or a portion of the apparatus may be made to act as a water wheel, or the gratings for straining may have the bars placed at an angle with the direction of the flow of the fluid to be
25 strained, so that as the fluid impinges on the inclined face of the bars a rotating motion may be given to the wheels. Or the fluid as it arrives at the apparatus may be made to give a rotary motion to it by means of suitable and known appliances, such as turbines, undershot, breast, and overshot wheels, or by means of vanes acted on by the current, or by
30 making the outer casing of the apparatus to act as a water wheel, the buckets of which discharge into the interior of the wheel, or by applying an apparatus similar to the curved bucket of a turbine to the periphery of the wheel. Discs without radial screens may have a brush or scraper which shall remove all material adhering to the perforated
35 side. The arms for supporting the brushes may be attached to the tank or receptacle into which the fluid flows. In some cases, the brushes may be hinged and weighted to adjust themselves to the face of the wheel, and in this case the wheel or disc may be placed either vertically or obliquely on the shaft. The screening surfaces may be constructed

Latham's Improvements in Filtering and Straining Sewage, &c.

either of gratings, bars, rods, plates, wires, wire gauze, perforated plates, or canvas or other known straining or filtering medium, such as charcoal, or a combination of any of these.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Baldwin Latham in the Great Seal Patent Office 5 on the 16th September 1869.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, BALDWIN LATHAM, of No. 6, Westminster Chambers, Victoria Street, Westminster, in the County of Middlesex, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her 10 Letters Patent, bearing date the Seventeenth day of March, in the year of our Lord One thousand eight hundred and sixty-nine, in the thirty-second year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Baldwin Latham, Her special licence that I, the said Baldwin Latham, my executors, administrators, and 15 assigns, or such others as I, the said Baldwin Latham, 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 20 Islands, and Isle of Man, an Invention for "**IMPROVEMENTS IN THE MEANS AND MACHINERY OR APPLIANCES FOR FILTERING AND STRAINING LIQUIDS, ESPECIALLY APPLICABLE FOR STRAINING SEWAGE,**" upon the condition (amongst others) that I, the said Baldwin Latham, my executors or administrators, by an instrument in writing under my, or their, or one of their hands 25 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 with a six calendar months next and immediately after the date of the said Letters Patent.

30

NOW KNOW YE, that I, the said Baldwin Latham, 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

Latham's Improvements in Filtering and Straining Sewage, &c.

in and by the following statement thereof, reference being had to the accompanying Drawings, and to the Figures and letters marked thereon, that is to say :—

My Invention consists in causing the sewage or other fluid to be
5 filtered to pass on its way along or as it issues from a conduit, against and through a travelling screen or sieve or combination of screening surfaces arranged at right angles or at any other convenient angle to the flow of the fluid, whereby the sewage or other fluid as it passes through the screening surfaces deposits its solid matter upon the latter, which in
10 travelling along carries such matter away to a point where it is removed from the surfaces and these then again pass into the stream of sewage to intercept fresh matter.

A variety of arrangements of apparatus or machinery may be employed for carrying my Invention into practice. Thus, in one arrangement the
15 travelling screen may be in form of a hollow wheel or drum, either cylindrical or polygonal, rotating on a central shaft, the one end surface of which drum is formed as a screen, while the other end surface is open for the sewage to enter it, and radially or obliquely in the drum are arranged a number of other screens revolving with the drum, upon which
20 screens as also on the screening end surface, the solid matter of the sewage is deposited as they pass through the latter. As these screening surfaces pass round the solid matter falls off them into a semicircular trough partly surrounding the central shaft, and in order to clear the screening surfaces more effectually from the adhering solid matter
25 brushes or scrapers are arranged at one or more places above the level of the fluid acting against the end screening surface, so as to remove the deposited matter therefrom, or a jet of water may be employed for this purpose, also at the circumference of the drum, or wheel troughs may be arranged running parallel with the axis of the drum, in which troughs
30 some of the fluid may be caught up, and when raised to a certain height such fluid is made to flow on to the radial screens and to wash the deposited solid matter therefrom into the before-mentioned trough or receptacle partly surrounding the shaft of the drum. To facilitate this the said screens may be constructed of parallel transverse bars placed at
35 such an angle that when raised into the position in which the fluid falls upon them from the troughs they are in a more or less horizontal position. Upon the shaft of the drum may be fixed an archimedian screw, which in revolving in the before-mentioned trough conveys the deposited matter

Latham's Improvements in Filtering and Straining Sewage, &c.

to one end, where it is made to pass through an opening into another trough or channel for conveying it to wherever required, and in which another revolving screw or other known contrivance may be arranged for facilitating its conveyance. The drum or wheel may also be divided by partitions (either constituting screens or otherwise) parallel with the 5 end surfaces into two or more compartments, having screening surfaces of different fineness, so as to sort the solid matter into correspondingly different degrees of fineness, or two or more separate screening wheels or drums of different degrees of screening power may be arranged behind each other, revolving either upon the same shaft or on different 10 shafts, and either at the same or different speeds. In some cases the radial screens may be dispensed with and a fixed brush or scraper may be used, which shall brush or scrape the inner end face of the perforated wheel, and in connection with the brush or scraper a trough may be used for conveying the matter either into the central trough of the wheel or 15 to the exterior of the wheel. Also in place of a wheel or drum a simple disc with or without radial screens may be employed. In some cases the outer face of the wheel may be wholly or partially closed, and perforations may be made in the skin or sole plate of the wheel, which openings will be so arranged as to be protected by the gratings of the 25 screens fixed in the interior of the wheel. Or in some cases the sole plate may be made perforated in the manner described for the end surface of the wheel. The wheel may have a shrouding either solid or perforated or a combination of both. The motive power when water or other fluid is being treated may be applied direct to the shaft of the 20 apparatus by fixing thereon a water wheel of any known description applicable for the purpose, or a portion of the apparatus may be made to act as a water wheel, or the gratings for straining may have the bars placed at an angle with the direction of the flow of a fluid to be strained, so that as the fluid impinges on the inclined face of the bars a rotating 30 motion may be given to the wheels. Or the fluid as it arrives at the apparatus may be made to give a rotary motion to it by means of suitable and known appliances such as turbines, undershot, breast, and overshot wheels, or by means of vanes acted on by the current, or by making the outer casing of the apparatus to act as a water wheel, the buckets of 35 which discharge into the interior of the wheel, or by applying an apparatus similar to the curved bucket of a turbine to the periphery of the wheel. Discs without radial screens may have a brush or scraper which shall remove all material adhering to the perforated side. The

Latham's Improvements in Filtering and Straining Sewage, &c.

arms for supporting the brushes may be attached to the tank or receptacle into which the fluid flows. In some cases the brushes may be hinged and weighted to adjust themselves to the face of the wheel, and in this case the wheel or disc may be placed either vertically or obliquely
5 on the shaft. The screening surfaces may be constructed either of gratings, bars, rods, plates, wires, wire gauze, perforated plates, or canvas, or other known straining or filtering medium, such as charcoal, or a combination of any of these.

Having thus set forth the nature of my Invention I will now proceed
10 more particularly to describe some of the various modifications I employ for carrying the same into practice, for which purpose I shall refer to the accompanying Sheets of Drawings.

Figure 1 shews a sectional side elevation of one arrangement, Figure 2 shews a plan of the same, and Figure 3 shews a front elevation
15 thereof.

A is a hollow wheel or drum, the circumference of which is of sheet metal, and which is open at the front face *a*, which is presented to the stream of sewage or other matter to be filtered flowing in the direction of the arrow through the culvert or channel B. The back face of the
20 wheel is closed by a screen *b* formed either of perforated plate, as shewn, or of gratings of the requisite degree of fineness, and if requisite a second screen *c* formed of gratings with larger apertures than *b* is fixed in the middle of the wheel to intercept the coarser portion of the solid matter. The wheel is carried by the shaft C to which it is secured by
25 the strong cast-iron boss *d* and ribs *e*, and it receives a slow rotary motion in the direction of the arrow by means of gearing D, D¹, from a turbine at E driven by the head of sewage water flowing through the apparatus. Inside the wheel A are fixed a number of radial screens *f, f, f*, by preference formed as a step grating, as shewn at the enlarged detail
30 section and part plan at Figures 4 and 5, the inclined transverse bars being intersected by longitudinal bars, as shewn, so as to form apertures of a small size. In place of such step gratings may be employed perforated plates, or even solid plates, or an arrangement may be advantageously used, as shown at Figure 6, where a screen *f*¹ of perforated
35 plates is fixed immediately above the step grating *f*.

The before-described construction of step gratings is also applicable, irrespective of its combination with the screening wheel for separating solid from liquid matter, thus they may be fixed in an inclined position

Latham's Improvements in Filtering and Straining Sewage, &c.

and the liquid in which the solid matter is held in suspension be made to flow down them. At the outer ends of the screens are formed either fixed troughs *g*, as at Figures 3 and 6, or a tumbling trough *g*¹, as at Figures 4 and 5, turning on pins *h*, which troughs take up fluid as the wheel revolves, and when the screens have been raised to a certain angle 5 the fluid flows out of the troughs and down the screens, flushing the solid sewage deposited thereon into the central trough *i*. At the same time the solid matter deposited upon the vertical screen *b* (as also on the intermediate screen *c*, when this is employed) by the passage through it of the sewage water also passes down on to the screens *f*, to facilitate 10 which brushes *j* carried by hinged arms, as shown, may, if necessary, be kept in contact with the outer surface of the screen *b*, or jets of water directed against the screen may be employed for this purpose, but the rushing back of the sewage water through the apertures of the screen on the descending side of the wheel as it dips into the fluid will generally 15 be found sufficient to flush the deposited matter off the vertical screen on to the radial ones. As the separated solid sewage passes into the central trough *i* it is carried forward in the same by the revolving screw blade *k* fixed on the shaft C, so as to fall either into trucks F run upon rails G underneath the trough, the front end of which is provided with a 20 sliding door *l* for this purpose actuated by a handle *m*. Or the trough *i* may be made to deliver continuously into a second trough, as shown at *n* in part plan at Figure 7, in which it may be carried forward either by another revolving screw blade *o*, driven by gearing *o*¹ from the shaft C, or by chain buckets. In order to gain access to the 25 radial screens for cleansing them when required man-holes *p* provided with covers are formed in the circumference of the wheel. Both faces of the wheel are provided with shroudings *q* for the purpose of catching and retaining sand passing in with the sewage, and to strengthen the wheel, and which also serve to close the ends of the troughs *f*. The sewage 30 water or other fluid holding solid matter in suspension after flowing through the screening apparatus passes through the channel H and sluice I to the turbine chamber E, whence it flows down the aperture K to the low level culvert L.

As before stated the construction of the before-described apparatus 35 may be greatly varied. In place of effecting the rotation of the wheel by means of a turbine or waterwheel, as described, the action of the fluid upon the apparatus itself may be made to effect its rotation either

Latham's Improvements in Filtering and Straining Sewage, &c.

by forming the vertical screen of a grating with oblique bars, against which the fluid is made to impinge, or an arrangement may be employed as indicated in part front elevation, vertical section, and sectional plan at Figures 8, 9, and 10, in which the front surface of the drum is
5 formed with an annular opening near the periphery, in which are curved vanes or blades *s* similar to those of a turbine or waterwheel, against which the fluid has consequently to impinge on entering the drum through the shoot *t*, and whereby it is consequently caused to drive the drum round in the direction of the arrow.

10 Should it be required still further to strain the sewage after passing through the above-described apparatus it may be caused to flow through a second wheel or disc covered with canvas or other suitable straining material which may be arranged as indicated in transverse section and front elevation at Figures 11 and 12 on Sheet II., where A is an inclined
15 revolving wheel covered at *a* with canvas or other sustable straining material through which the sewage is made to flow in the direction of the arrow, and upon which the solid matter yet contained therein is consequently deposited. As the straining surface revolves it carries such deposited matter round to the fixed scraper B in contact with the
20 straining surface, which consequently removes the deposited matter and causes it to pass into the trough C attached thereto, or formed in one therewith, in which trough it is conducted to wherever required. Two or more such straining discs of different degrees of fineness may also be fixed one behind the other upon one and the same shaft.

25 Having thus described the nature of my Invention, and in what manner the same is to be performed, I wish it to be understood that I in no way limit myself to the arrangements thereof shown on the accompanying Drawings, as these only serve to indicate some of the various modes in which it may be carried into effect, but what I
30 claim is,—

First. Constructing apparatus for separating the solid from the liquid matter of sewage or other fluids, wherein a travelling screen or combination of screens is or are caused to pass through the sewage or other fluid at right angles, or at any convenient angle to its flow, upon which
35 screen the solid matter is deposited from the sewage or other fluid, and is conveyed away to a point where it is removed from the screen, substantially as described.

Latham's Improvements in Filtering and Straining Sewage, &c.

Second. Constructing apparatus for separating the solid from the liquid matter of sewage or other fluids, consisting of a revolving drum or wheel, having one or more vertical screening surfaces and a series of radial screens or solid surfaces, from which the deposited matter is caused to flow into a central receptacle, whence it is conveyed to 5 wherever required, substantially as described.

Third. The employment of one or more revolving, vertical, or inclined screening discs without radial screens, substantially as described with reference to Figures 11 and 12 of the Drawings.

Fourth. The application of fixed or tumbling troughs at the outer 10 ends of the radial screens for the purposes set forth.

Fifth. So constructing the screening apparatus that the flow of the sewage through the same shall directly impart to it the requisite rotary motion, substantially as described.

Sixth. The employment of step gratings, as herein-before described 15 with reference to the accompanying Drawings, whether fixed or moveable for separating solid matter from liquids.

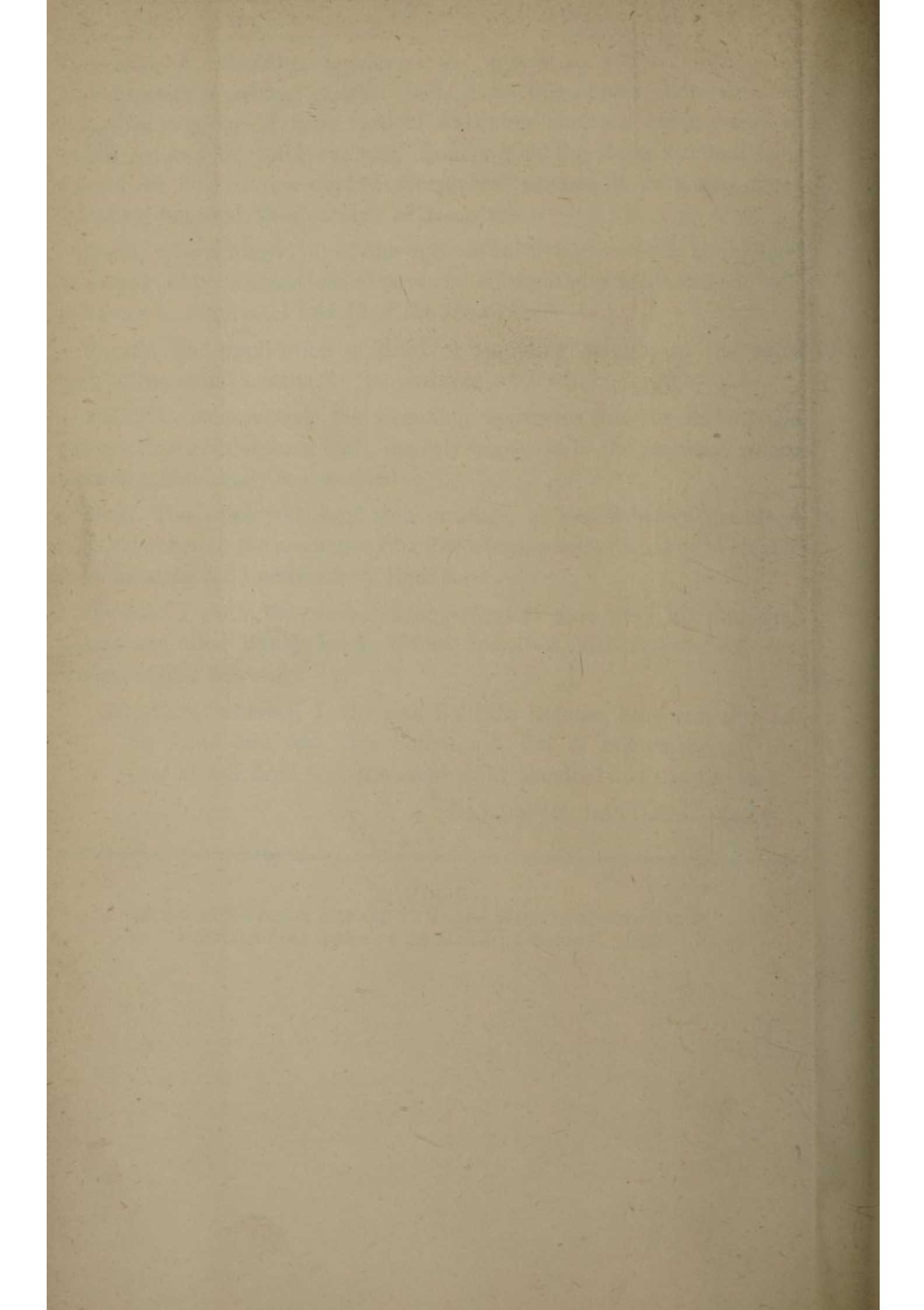
Seventh. I claim the general arrangement of apparatus for straining sewage and other liquids herein-before described, with reference to the accompanying Drawings. 20

In witness whereof, I, the said Baldwin Latham, have hereunto set my hand and seal, this Fourteenth day of September, in the year of our Lord One thousand eight hundred and sixty-nine.

BALDWIN LATHAM. (L.S.)

LONDON :

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1869.



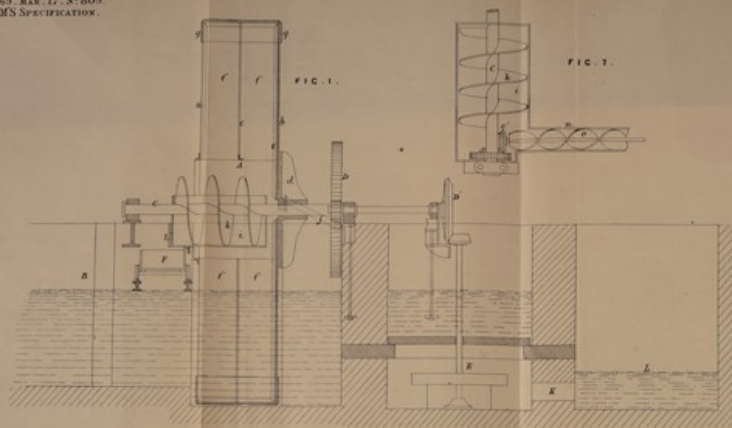


FIG. 1.

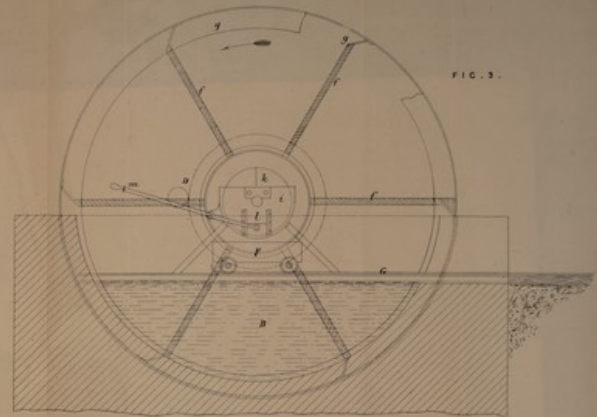


FIG. 3.

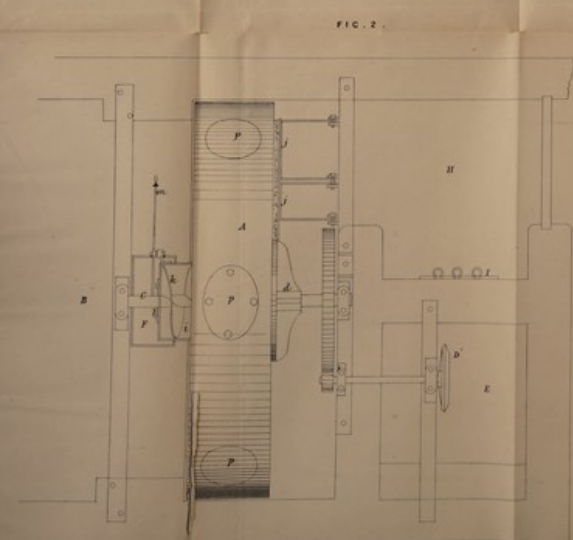


FIG. 2.

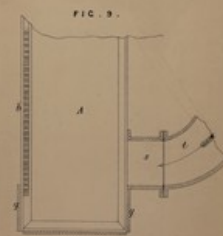


FIG. 9.

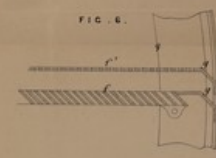


FIG. 6.

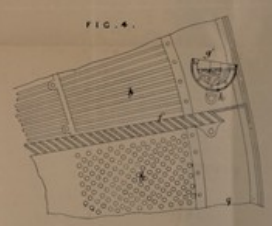


FIG. 4.

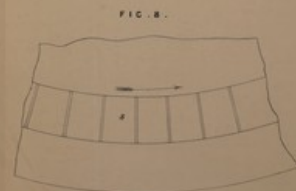


FIG. 8.

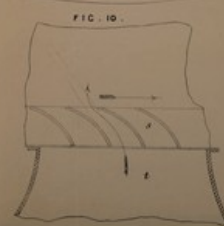


FIG. 10.

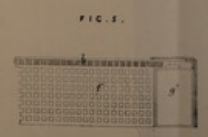


FIG. 5.

the filed drawing is partly altered.

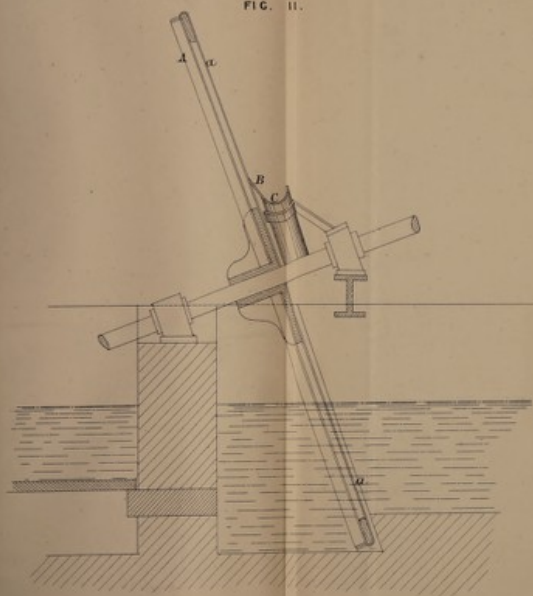
LONDON: PRINTED BY GEORGE EDWARDS, FINE AND WILLIAM LUTHERWICK.
PRINTERS TO THE QUEEN AND PARLIAMENT. 1869.

Drawn and Etched by M. J. & S. S.



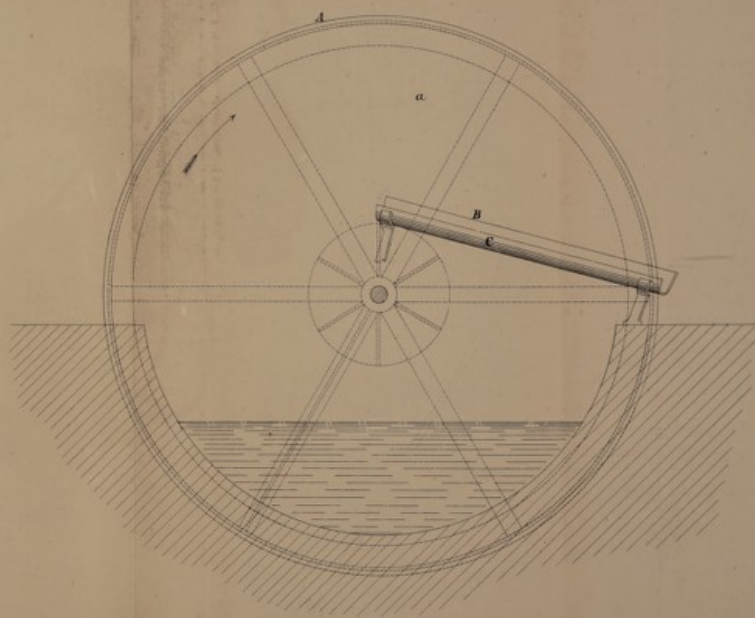
A.D. 1869, MAR. 17. N° 809.
LATHAM'S SPECIFICATION.

FIG. 11.



The filed drawing is partly colored.

FIG. 12.



Drawn on Stone by Mallet & Sons.

LONDON: Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE.

(2 SHEETS)
SHEET 2

THE NEW YORK
LIBRARY