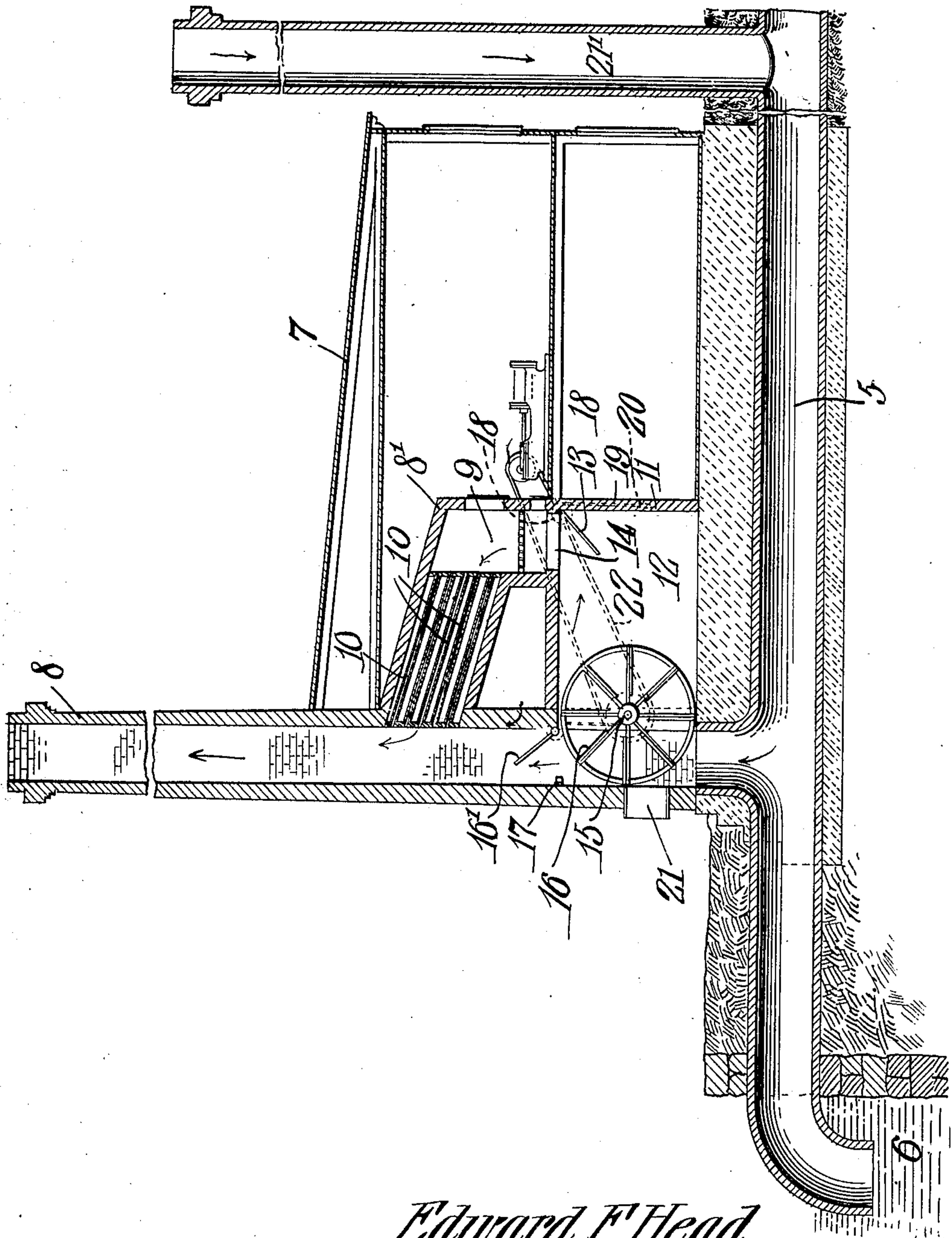


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 APPLICATION FILED NOV. 4, 1907. RENEWED JULY 14, 1908.

913,131.

Patented Feb. 23, 1909.



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# UNITED STATES PATENT OFFICE.

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## SYSTEM FOR VENTILATING AND PURIFYING SEWERS AND THE LIKE.

No. 913,131.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed November 4, 1907, Serial No. 400,576. Renewed July 14, 1908. Serial No. 443,513.

*To all whom it may concern:*

Be it known that I, EDWARD FRANCIS HEAD, a subject of the King of Great Britain, residing at Sudbury, in the Province of Ontario and Dominion of Canada, have invented a new and useful System for Ventilating and Purifying Sewers and the Like, of which the following is a specification.

This invention relates to systems for ventilating and purifying sewers and has for its object to provide means for consuming the foul air and gases in the sewer mains of large cities, town and other communities, the combustion of the foul air and gases being utilized to generate steam for running a motor or engine or for doing other mechanical work.

A further object of the invention is to provide a valve or damper for deflecting foul air and gases from the sewer into the combustion chamber, there being a fan mounted for rotation in the ventilating shaft or stack beneath the combustion chamber and actuated by the draft in said stack for producing additional power.

Further objects and advantages will appear in the following description.

In the accompanying drawing, forming a part of this specification and in which like characters of reference indicate corresponding parts there is illustrated a preferred embodiment of the invention capable of carrying the same into practical operation, it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims.

The improved ventilating system is principally designed for installation in large cities, towns and other communities in which the refuse of the city is carried off by a system of under-ground pipes or conduits and by way of illustration a portion of a sewer main is shown at 5 with one end thereof communicating with a sewer disposal indicated at 6.

Erected above the sewer main 5 is a power house 7 of any approved construction, the latter being provided with a vertically disposed ventilating shaft or stack 8, the lower end of which communicates with the sewer

main, as shown. Arranged within the power house 7 is a boiler furnace 8' having a fire box 9 and provided with a plurality of fire tubes 10 which form a source of communication between the combustion chamber 9 and the interior of the ventilating shaft or stack.

Disposed beneath the furnace 8' and preferably disposed in alinement with the front wall thereof is a partition 11 defining a foul air chamber 12, there being a valve or damper 13 pivotally mounted for swinging movement on the partition 11 and adapted to close an opening 14 formed in the furnace 8' beneath the fire-grate, as shown. The front end of the chamber 12 communicates with the interior of the ventilating shaft or stack 8 and mounted for rotation in the adjacent wall of the chamber 12 at the open end thereof is a fan 15 the radiating blades 16 of which extend partly within the stack and in the path of the foul air or gases arising from the sewer main. Pivotaly mounted for swinging movement above the fan 15 is an auxiliary valve or damper 16' the function of which is to deflect the gases arising from the sewer through the chamber 12 and opening 14 into the combustion chamber 9, there being a stop lug 17 formed on the interior walls of the stack for limiting the downward movement of the valve or damper 16, as shown.

The valves 13 and 16' may be operated in any suitable manner and in the present instance are shown each provided with a drum 18 to which is attached a flexible cord 19 terminating in a handle 20 so that by operating the handles 20 the valves may be moved to open and closed position.

An air vent or opening 21 is preferably formed in the stack 8 at a point adjacent the fan 15 thereby to admit fresh air to the interior of said stack. An air shaft or intake 21' also preferably communicates with the interior of the sewer main 5 so as to permit free circulation within the latter.

In operating the system in large cities and towns where the accumulation of gas in the sewer mains is sufficient to afford a constant supply of fuel for the furnace, the valve 16' is moved to closed position and the valve 13 to open position in which event



the foul air and gases from the sewer main will enter the chamber 12 and thence pass through the opening 14 to the combustion chamber 9 where they will be thoroughly consumed and the products of combustion discharged through the fire tubes 10 to the stack, the steam generated in the boiler being utilized for running a motor or engine or for producing other mechanical work.

10 As the foul air or gases pass through the chamber 12 they will revolve the fan 15 and thus produce a suction in the sewer main, this suction being increased by the draft in the stack due to the discharge of the products of combustion from the furnace.

A belt or other flexible medium 22 may be connected with the fan 15 and extend to a motor or other mechanical device to assist in producing power.

20 When the system is installed in relatively small towns where the accumulation of gas in the sewer would not be sufficient to maintain the furnace in constant operation the valve 13 is closed and the valve 16' moved to open position. A fire having been previously started in the furnace 8' the products of combustion escaping to the ventilating shaft or stack through the fire tubes will ignite the sewer gases thus producing a draft and causing the wheel or fan to rotate in the manner before described.

From the foregoing description it is thought that the construction and operation of the device will be readily understood by those skilled in the art and further description thereof is deemed unnecessary.

Having thus described the invention what is claimed is:

1. The combination with a sewer, of a ventilating shaft communicating therewith, a furnace having a foul air chamber, a valve for deflecting the foul air from the sewer through the chamber to said furnace, and a valve disposed within the chamber for cutting off communication between the sewer and the furnace.

2. The combination with a sewer, of a ventilating shaft communicating therewith, a furnace having a foul air chamber disposed beneath the same, a fan mounted for rotation within the foul air chamber, a damper disposed within the ventilating shaft for deflecting the foul air from the sewer through the chamber to the furnace, and a valve for cutting off communication between the furnace and foul air chamber.

3. The combination with a sewer, of a ventilating shaft communicating therewith, a furnace having a foul air chamber arranged beneath the same, a fan mounted for rotation in the foul air chamber, means disposed within the ventilating shaft for deflecting the foul air from the sewer through the foul

air chamber to the furnace, and means for cutting off communication between said chamber and furnace.

4. The combination with a sewer, of a ventilating shaft communicating therewith, a furnace including a fire chamber and having a plurality of flues forming a source of communication between the fire-box and ventilating shaft, there being a foul air chamber disposed beneath the furnace and communicating with the latter, a fan mounted for rotation in the foul air chamber, means disposed within the shaft for deflecting the foul air from the sewer through the chamber into the fire-box, and a valve for cutting off communication between the foul air chamber and said fire-box.

5. The combination with a sewer, of a ventilating shaft communicating therewith, a furnace having a fire-box and provided with a plurality of fire tubes forming a source of communication between the fire box and ventilating shaft, there being a foul air chamber arranged beneath the furnace, a fan, a damper disposed within the shaft above the fan for deflecting the foul air from the sewer through the foul air chamber to the fire-box, a damper for cutting off communication between said chamber and fire-box, a motor, and means connecting the motor and fan for transmitting motion from one to the other.

6. The combination with a sewer, of a ventilating shaft communicating therewith and provided with an air inlet, a boiler furnace having a fire-box and provided with a plurality of fire tubes forming a source of communication between the fire-box and ventilating shaft, a partition depending from the furnace and forming a foul air chamber opening into the ventilating shaft, a fan mounted for rotation in the foul air chamber at said opening and projecting partly within the ventilating shaft, a damper pivotally mounted within the ventilating shaft above the fan for directing the foul air from the sewer through the foul air chamber to the fire box, and a valve pivotally mounted on the partition for cutting off communication between the foul air chamber and fire-box.

7. The combination with a sewer, of a ventilating shaft communicating therewith, a furnace having a foul air chamber, means for deflecting the foul air from the sewer through the chamber to said furnace, means for cutting off communication between said chamber and furnace, and an air intake spaced from the ventilating shaft and communicating with the sewer.

8. The combination with a sewer, of a ventilating shaft communicating therewith, a furnace having a foul air chamber arranged beneath the same, a fan, means disposed

within the ventilating shaft for deflecting  
the foul air from the sewer through the foul  
air chamber to the furnace, means for cut-  
ting off communication between said cham-  
5 ber and furnace, and an air intake pipe  
spaced from the ventilating shaft and com-  
municating with the interior of the sewer.

In testimony that I claim the foregoing  
as my own, I have hereto affixed my sig-  
nature in the presence of two witnesses.

EDWARD FRANCIS HEAD.

Witnesses:

MAY HUNTER,  
EILEEN F. HEAD.