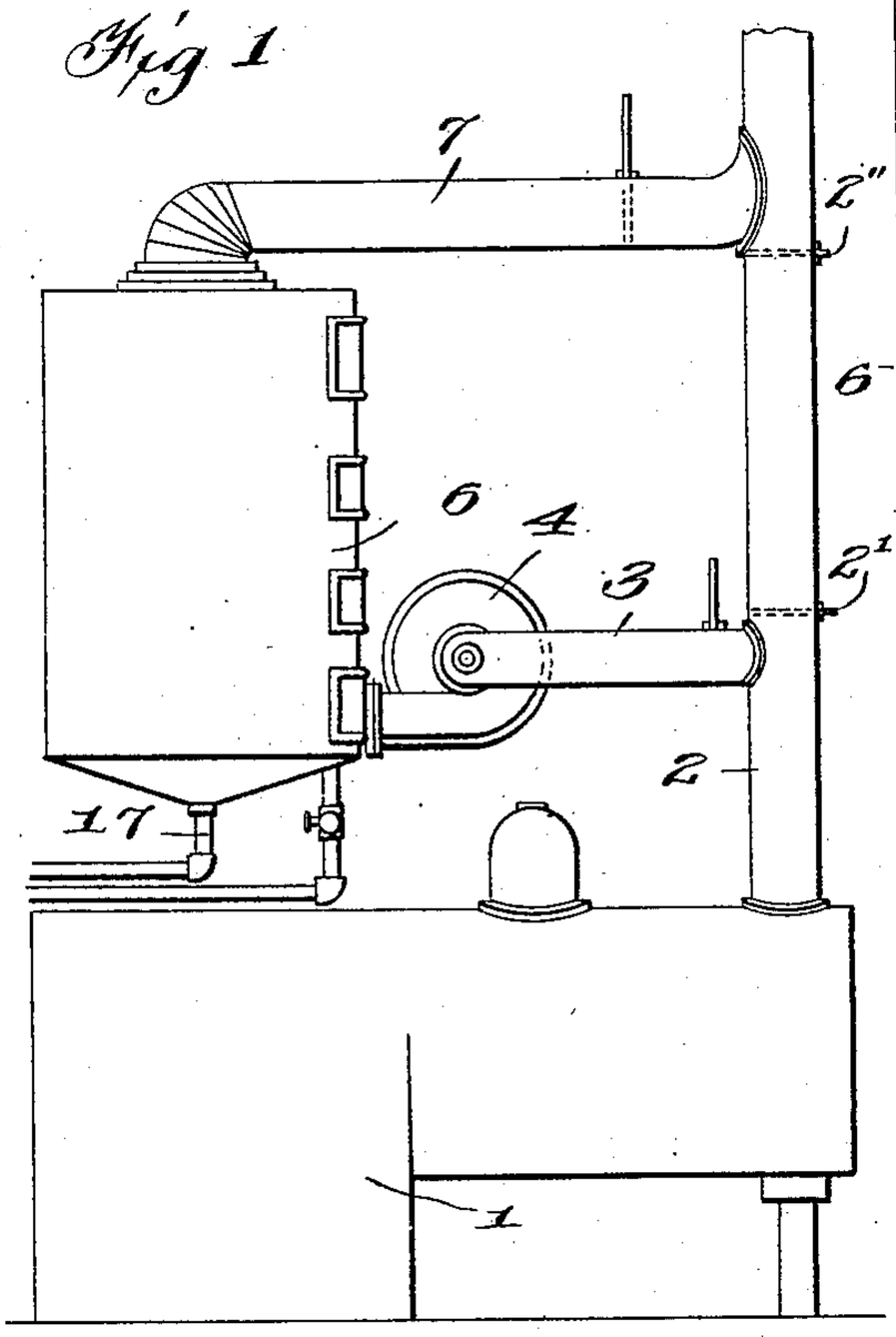
E. P. FULLER.

SMOKE FILTER.

APPLICATION FILED AUG. 5, 1908.

907,769. Patented Dec. 29, 1908.

Fig 1



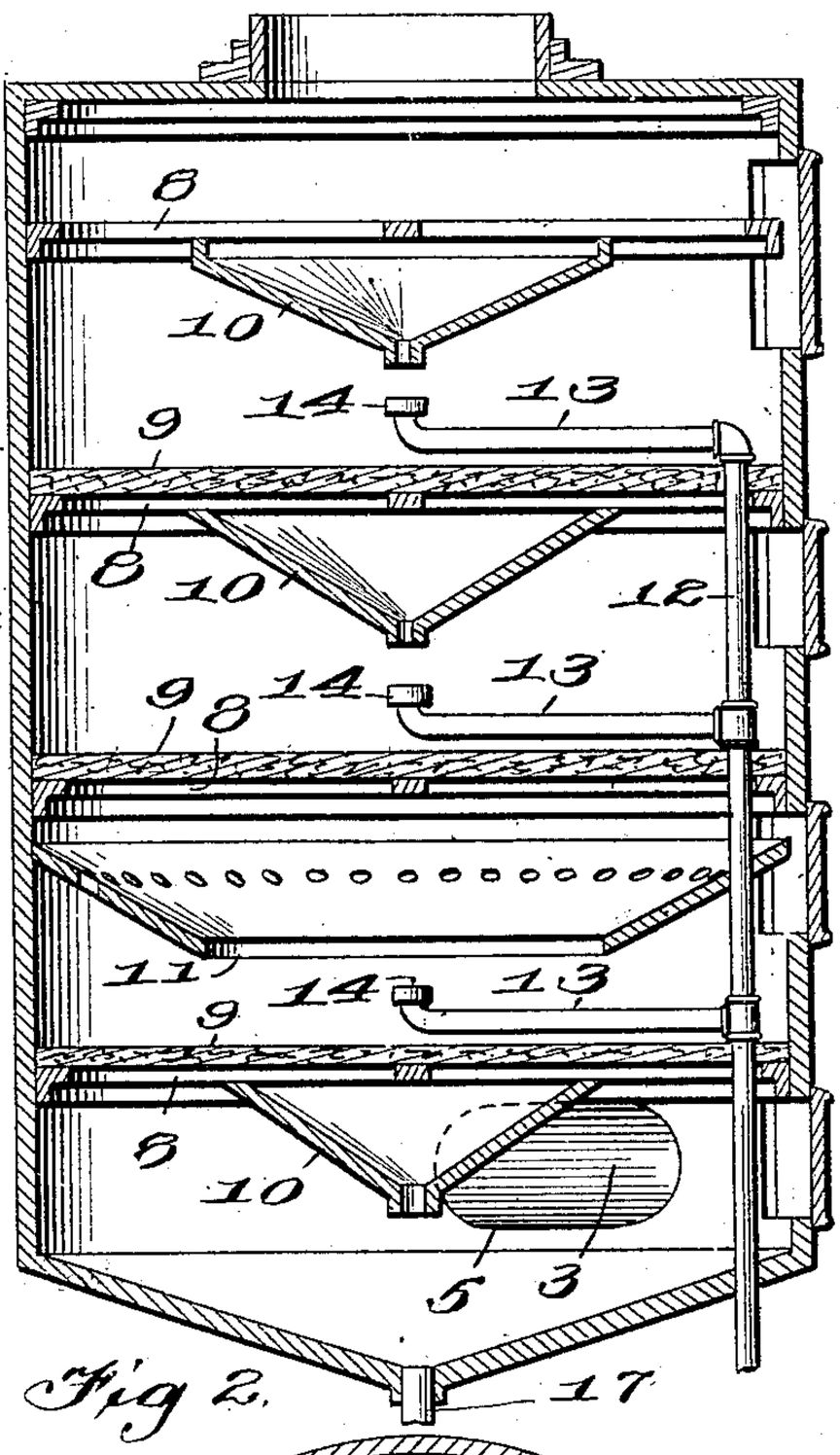


Fig 2.

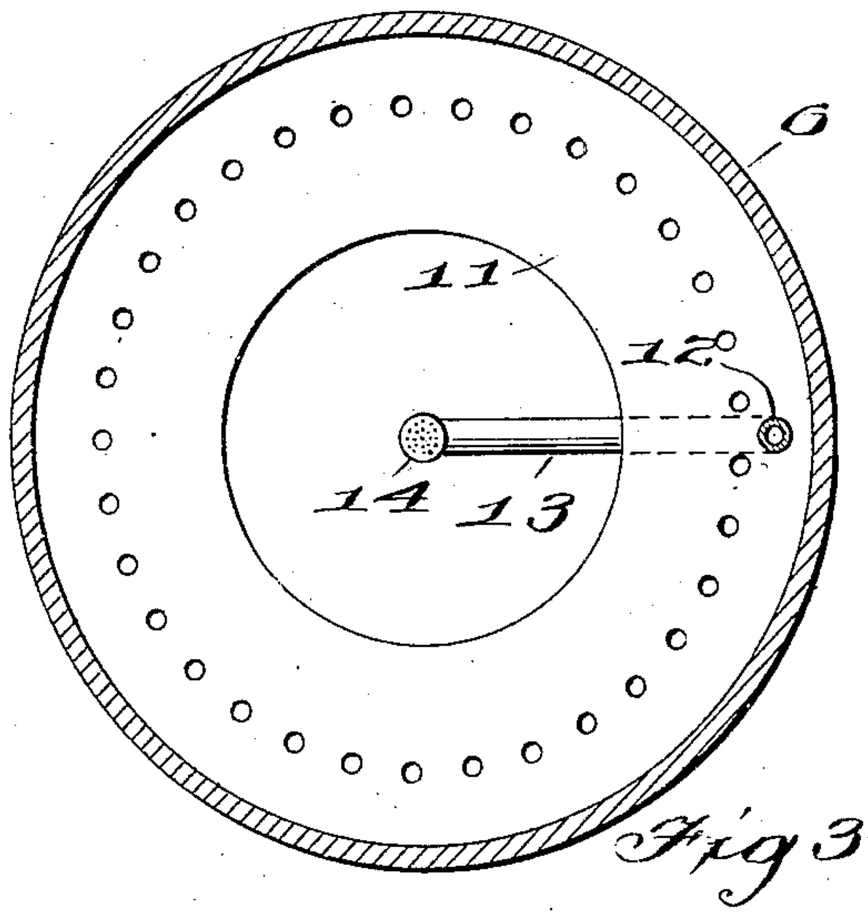


Fig 3

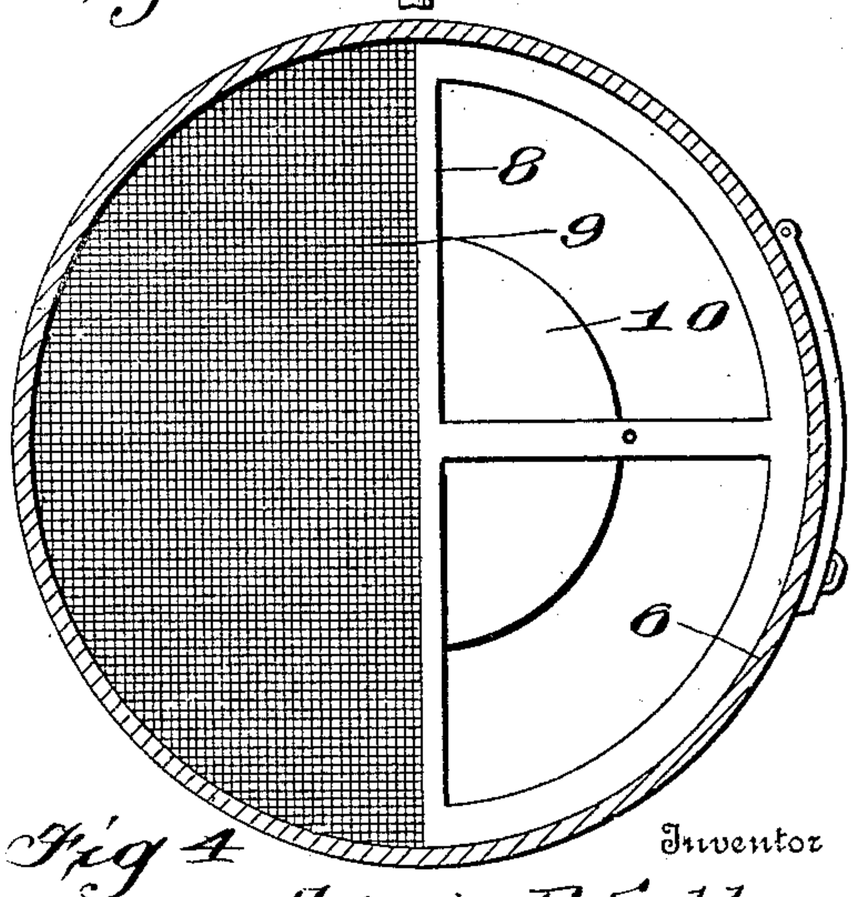


Fig 4

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UNITED STATES PATENT OFFICE.

EDWIN P. FULLER, OF DETROIT, MICHIGAN.

SMOKE-FILTER.

No. 907,769. Specification of Letters Patent. Patented Dec. 29, 1908.

Application filed August 5, 1908. Serial No. 447,159.

To all whom it may concern:

Be it known that I, EDWIN P. FULLER, citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Smoke-Filters, of which the following is a specification.

My invention is a smoke filter, its object being to provide means for separating the soot, cinders and unconsumed material from the gases, and condensing and discharging the gases into the smoke stack or open air; and the invention consists in the peculiar construction, arrangement and combination of the parts.

Figure 1 is a side elevation of a furnace provided with my invention. Fig. 2 is a vertical section of the filter. Fig. 3 and Fig. 4 are details of parts of the filter.

In the drawings, 1 is the furnace; 2 the smoke stack; 2′ a damper in the stack above the pipe 3 which extends from the stack to the filter 6, entering the filter near the bottom on a tangent 5, as shown in Fig. 2. In the pipe 3 I have located an exhaust device 4 which may be a fan or pump run at sufficient speed to create a vacuum and draw the smoke from the stack or the fire place as the pipe 3 may be connected direct to the fire place, and force the smoke into the filter 6 through the tangential opening 5.

7 is a pipe at the top of the filter conveying the gases to the smoke stack, or it may be to the open air.

My filter 6 is a hollow chamber cylindrical or otherwise which for convenience I will term a drum. It is provided with a conical shaped bottom having the drip pipe 17 at the center of the depending apex. The drum is divided into a number of compartments by one or more partitions 8, preferably placed horizontally, each having a mattress 9 composed of fibrous matter such as asbestos or mineral wool.

10 is a conical shaped plate inverted and secured to the under side of the partition at the center thereof. It is about one-half the diameter of the drum, and its purpose is to deflect the smoke as it arises from the bottom of the drum to the sides of the drum. 11 is a dished plate secured to the wall of the drum, or to the partition, between the partitions, and has its center cut away about one-half its diameter, the remainder of the plate being bent downward from the wall. These plates 10 and 11 are arranged alternately in the compartments, viz: the smaller in the first, 11 in the second, 10 in the third, etc.; and they are for the purpose, as stated, of deflecting and directing the smoke and giving it a more perfect circulation through the mattresses.

12 is a water pipe extending up the side of the drum, with tubes 13 leading to the center of each compartment, each provided with a spray nozzle 14 to spray the chamber, to wash the lower side of the mattress, and rinse off the plates, soot, cinders, etc., being washed to the bottom of the drum and out of the pipe 17.

In order that the soot and noncombustible material falling upon the upper side of the mattresses may be removed, I provide a door to each compartment through which the accumulations may be removed. Of course the number of partitions, mattresses and plates may be increased or diminished according to the required capacity of the exhaust. The damper 2″ is for the purpose of preventing the exhaust 4 drawing the gas discharged from the filter down the stack into the filter again. When the fire is first built these dampers are opened until a head of steam is attained sufficient to drive the exhaust 4 when the dampers are closed and the smoke drawn through the filter.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A smoke filter comprising a chamber having a tangential inlet at its lower portion, and an outlet at the top, and a series of partitions across the chamber, the lower partition comprising a plate having a central opening and a mattress of fibrous material above the plate, the next partition comprising a perforated plate provided with a large central opening and a mattress of fibrous matter above the plate, the next partition like the lower, and so on alternating plates and mattresses to the top of the filter, and a spray pipe between the partitions, as specified.

2. A smoke filter comprising a chamber having a tangential inlet at its lower portion, a series of hopper shaped plates smaller than the chamber, a series of plates of the size of the chamber having a large central opening, the two series of plates alternating in the chamber, a mattress of fibrous material between the plates, and a spray pipe between the mattresses, as specified.

3. In a smoke filter, the combination with a drum, of a pipe leading from the furnace to the drum and having a tangential entrance to the drum at the bottom thereof, and the discharge pipe at or near the top of the drum, of one or more partitions in the drum, the partitions comprising a plate having a central opening and a mattress of fibrous material above the plate, a spray pipe between each pair of partitions, and an exhaust device for forcing the smoke from the furnace through the filter, substantially as specified.

4. A smoke filter comprising a chamber having a flat top and a funnel shaped bottom provided with a drip pipe, an opening near the bottom connected with a pipe entering the opening tangentially, a series of mattresses across the chamber composed of fibrous matter, arranged one above the other, a spray pipe between each mattress and an opening at the top of the chamber, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

EDWIN P. FULLER.

Witnesses:

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