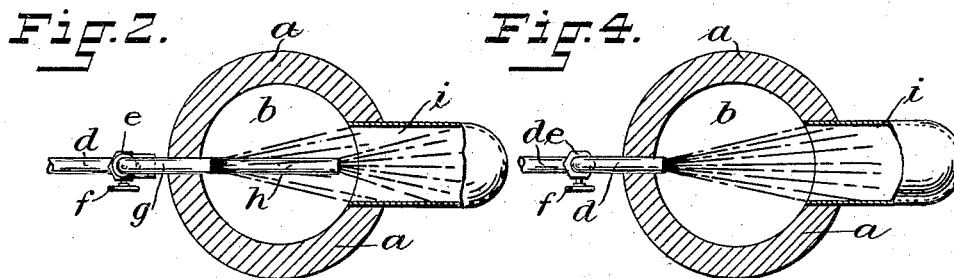
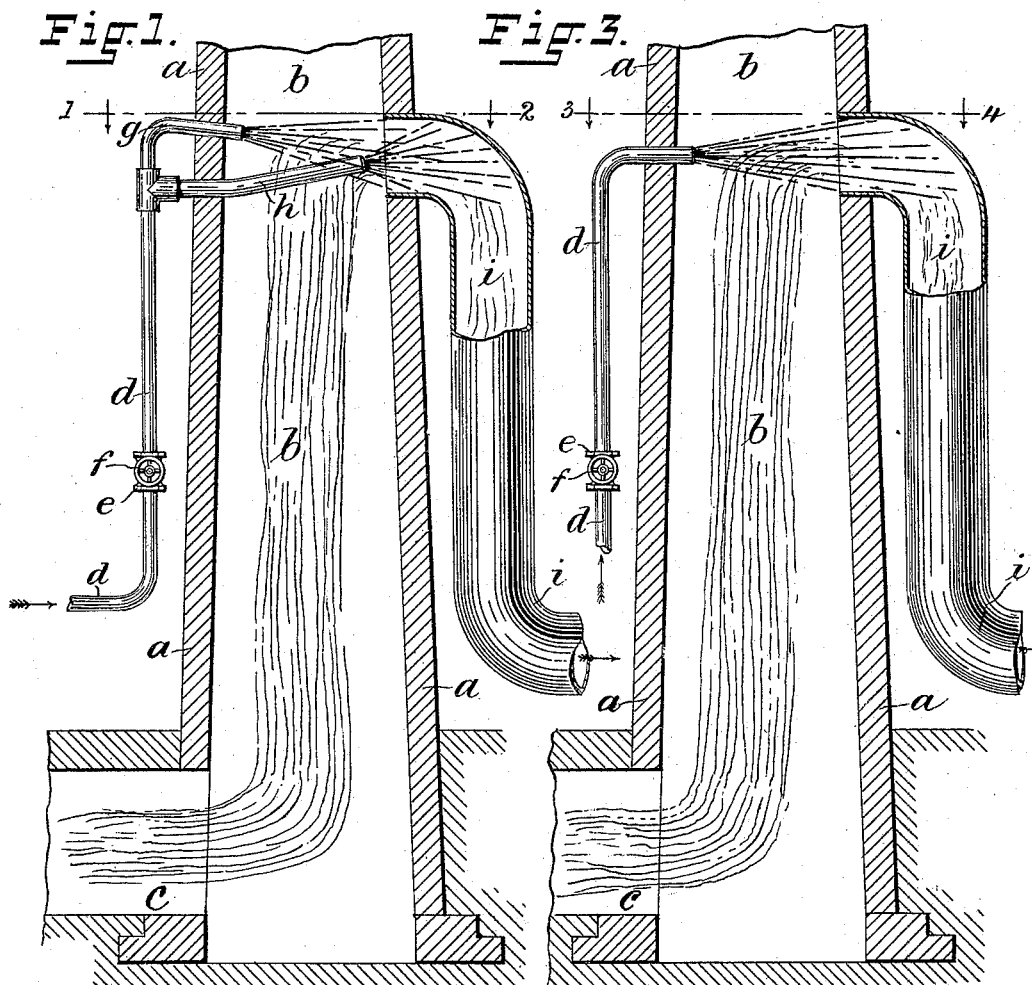


(No Model.)

F. R. JONES.  
SMOKE PREVENTER.

No. 417,921.

Patented Dec. 24, 1889.



WITNESSES:

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Attorney.

# UNITED STATES PATENT OFFICE.

FREDERICK ROBERT JONES, OF HUDDERSFIELD, COUNTY OF YORK,  
ENGLAND.

## SMOKE-PREVENTER.

SPECIFICATION forming part of Letters Patent No. 417,921, dated December 24, 1889.

Application filed August 31, 1889. Serial No. 322,614. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK ROBERT JONES, a subject of the Queen of Great Britain, residing in Huddersfield, Yorkshire, England, have invented certain new and useful Improvements in the Means to be Employed for Preventing the Emission of Smoke from Mill or other Chimneys, of which the following is a specification.

This invention relates to a new or improved method of and means for preventing the emission of black or dense black smoke from mill and other chimneys, the object of such invention being to keep the atmosphere free from soot and like impurities with which it is now charged by reason of the large amount of dense black smoke emitted from mill-chimneys and also from chimneys connected with houses and other buildings.

To the aforesaid purpose my invention consists of the means and novel arrangement and construction of the several parts of the apparatus, all as hereinafter fully described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a sectional elevation of a mill-chimney, showing my improvements applied thereto, and Fig. 2 is a plan view of same, taken on line 1 2 in Fig. 1. Fig. 3 is a similar sectional elevation to Fig. 1, and shows another form of arrangement of part of the apparatus. Fig. 4 is a sectional plan view of same, taken on line 3 4 in Fig. 3.

Like letters of reference designate corresponding parts throughout the drawings.

The letter *a* designates the wall or sides of the chimney, which are of ordinary known construction; *b*, the shaft or interior thereof, and *c* the flue or channel of communication between the furnace or fire and the bottom portion of the shaft *b*, and by which the smoke passes from the fire to the chimney.

*d* is a pipe placed vertically on one side and without the chimney, the lower end being connected to any convenient source near at hand from whence steam or air can be obtained, such as the boiler, exhaust-steam pipe, fan, bellows, or suction-pump. Attached to the pipe *d* is a valve *e*, which is opened and closed, for the purpose of admitting or shut-

ting off steam or air, by means of the hand-wheel *f* or by a key. To the upper end of pipe *d* are connected two branch pipes *g* and *h* of unequal lengths, the shorter pipe *g* passing through the wall *a* and terminating just within the interior of the chimney, and the longer pipe *h* passing through the wall *a* and extending across the shaft *b* to near the opposite side of the chimney. The pipes *g* and *h* are inclined toward each other, so that their open ends point or are directed to one common center.

On the opposite outer side of the chimney to that occupied by the pipe *d* is a vertical fall-pipe *i*, of much larger diameter than the pipe *d*, the upper end of which said pipe *i* is bent inward at right angles and inserted into a corresponding opening made in the side of the chimney, so that its mouth is exactly opposite the open ends of the branch pipes *g* and *h*. The lower end of the pipe *i* may communicate with the fire-box of the boiler, in order that the smoke which such pipe is intended to convey from the chimney may be passed over the fire and consumed, or the said pipe may be connected with a tank or receiving-vessel.

The operation of the apparatus above described is as follows: When dense black smoke is being given off from the fire or furnace, the valve *e* is opened, so as to allow steam or air from the boiler or fan or other source from whence steam or air is obtained to pass therethrough to the upper portion of the pipe *d*, where it enters the branch pipes *g* and *h* and issues from the open ends thereof in the form of jets or sprays of steam or strong currents of air, the steam or air issuing from the pipe *g* (which commands the area of the shaft *b*) intercepting the ascending smoke and forcing it across the chimney into the pipe *i*, while the steam or air issuing from the branch pipe *h* (whose open end is near the mouth of the pipe *i*) assists in drawing the smoke from the chimney into the pipe *i* and forces it down the said pipe, which, if in communication with the fire-box of the boiler, distributes it over the fire, where it is consumed; or if connected with a receiving-vessel it may deposit the intercepted smoke

therein, and this deposit afterward treated and used for manuring or other purposes. If the smoke is too much saturated or moistened by the steam to be consumed by the fire, it  
5 may be first passed through an ordinary condenser and from thence to the fire. It will, however, be obvious that the intercepted smoke could be taken from the fall-pipe *i* and disposed of in various ways in addition  
10 to those I have named, and I mention such methods simply to show that, having intercepted it in the chimney and forced it from thence into a fall-pipe, it can be afterward treated and used without being dis-  
15 charged into the atmosphere; but the special feature and novelty of my invention are in intercepting and preventing the emission of the smoke from chimneys, and by this means to keep the atmosphere free from particles of  
20 soot and other accompanying impurities of smoke.

In Figs. 3 and 4 I show the upper end of the pipe *d* bent at right angles and passed through the side of the chimney, thus inter-  
25 cepting and forcing the smoke into the pipe *i* by one jet of steam or current of air, instead of by two, as in Figs. 1 and 2.

The pipes *d* and *i* may be carried to any height in the chimney, as it is immaterial at  
30 what point between the base and top of the chimney the steam or air is introduced. In the case where a number of chimneys are near to each other or in the same block it would be preferable to supply each pipe *d*  
35 with steam or air obtained from one boiler or

fan, instead of having a separate boiler or fan for each chimney.

I claim as my invention—

1. The combination, with a chimney provided with a side opening for the discharge 40 of carbonaceous material, of a small pipe having its open end opposite said opening and at the other side of the chimney, whereby a jet of steam or air may be caused to impinge upon the products of combustion con- 45 tinuously ascending between the said pipe and the discharge-opening to remove the carbonaceous material, substantially as set forth.

2. The combination, with a chimney, of a delivery-pipe projecting therefrom and hav- 50 ing its end opening substantially at right angles to the chimney, a small downwardly-inclined pipe projecting for a short distance through the chimney, and a small upwardly- 55 inclined pipe projecting nearly the whole distance across the chimney, both the said pipes being opposite the open end of the delivery-pipe and adapted to drive jets of steam or air across the smoke-current, substantially as 60 and for the purpose set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

FREDERICK ROBERT JONES.

Witnesses:

CHANNING W. WHITMAN,  
*U. S. Consular Agent at Huddersfield.*  
HENRY WHITMAN,  
*Clerk to C. W. Whitman.*