

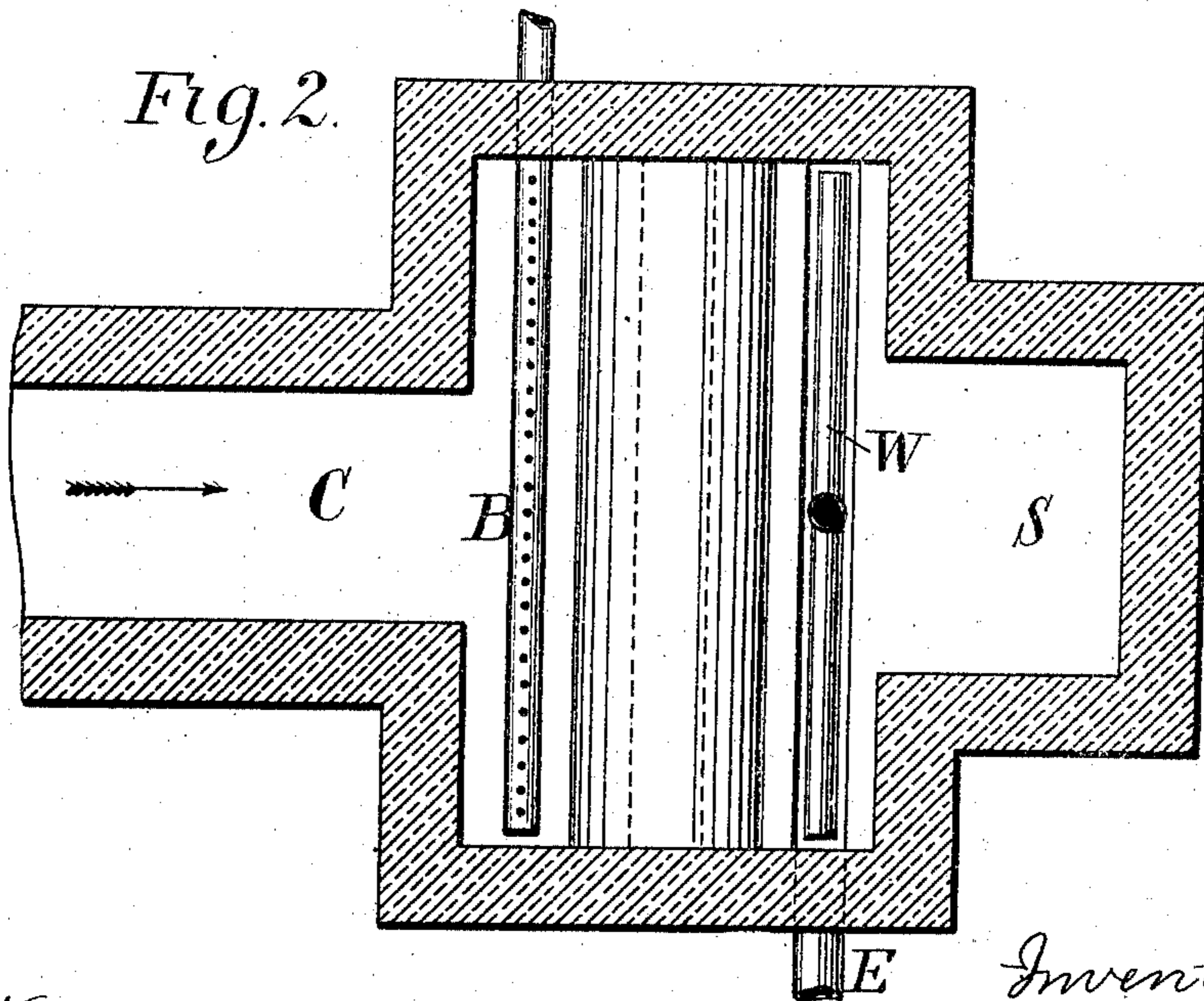
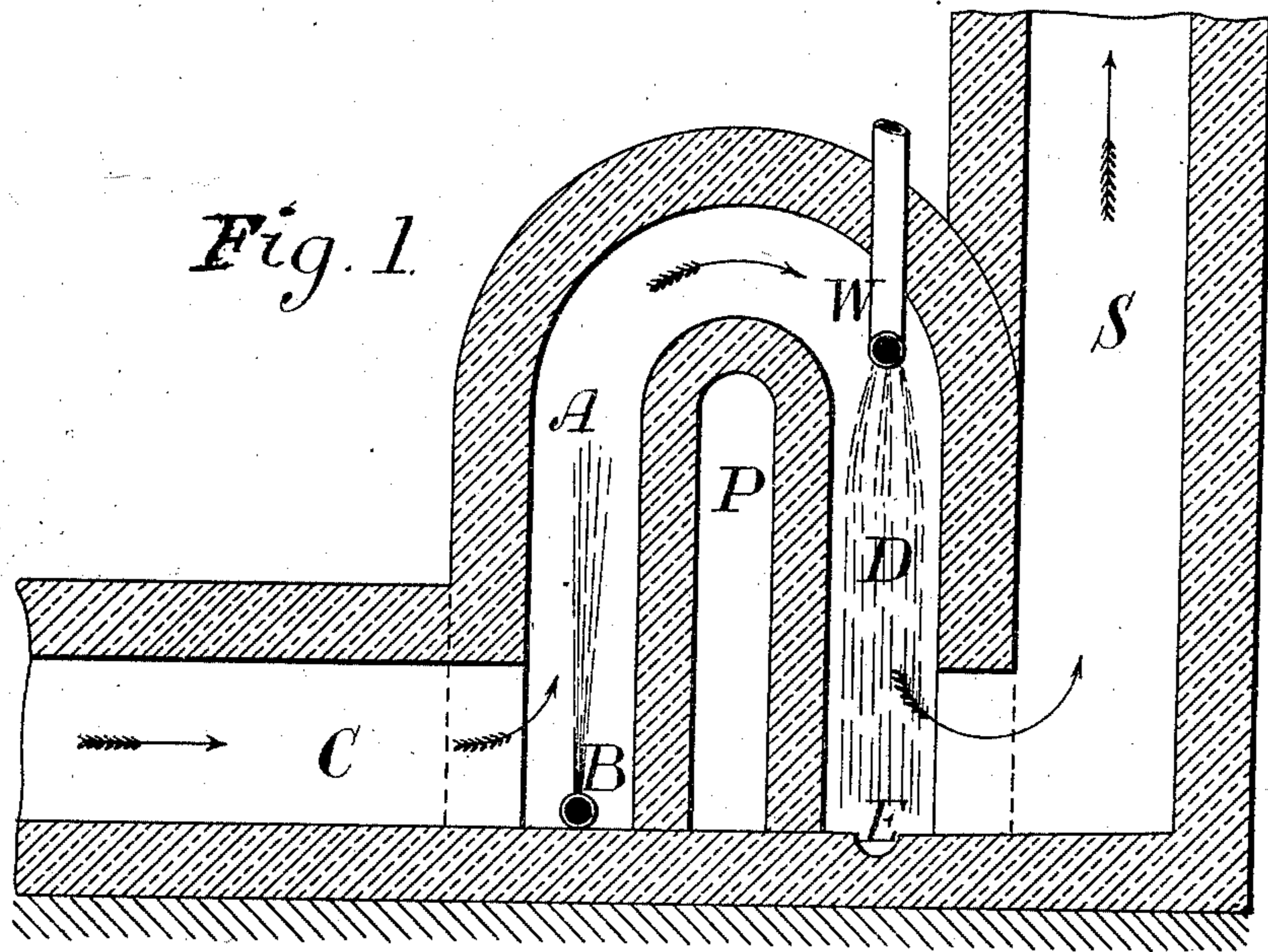
(No Model.)

E. E. DULIER.

APPARATUS FOR REMOVING IMPURITIES FROM SMOKE.

No. 509,798.

Patented Nov. 28, 1893.



Witnesses:  
G. W. Rea,  
Thos. A. Green

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By James L. Norris  
att'y.

# UNITED STATES PATENT OFFICE.

EDWARD E. DULIER, OF LONDON, ENGLAND.

## APPARATUS FOR REMOVING IMPURITIES FROM SMOKE.

SPECIFICATION forming part of Letters Patent No. 509,798, dated November 28, 1893.

Application filed May 25, 1893. Serial No. 475,475. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD EUGENE DULIER, a citizen of Belgium, residing at No. 27 Sloane Gardens, Chelsea, London, England, have invented certain new and useful Apparatus for Removing Impurities from Smoke, of which the following is a specification.

In the specification of my Patent No. 490,550 dated January 24, 1893, I have described means of removing impurities from smoke by mixing the smoke with steam and then cooling the mixture so as to condense the steam and cause deposit of the carbonaceous, sulphurous and other matters carried in the smoke.

My present invention relates to a construction of apparatus for this purpose more especially applicable for dealing with the smoke and products of combustion from boiler and other furnaces. I shall describe this construction referring to the accompanying drawings.

Figure 1 is a vertical section and Fig. 2 is a sectional plan of apparatus according to my present invention for causing deposit of carbonaceous, sulphurous and other impurities from the products of combustion of a furnace or set of furnaces.

C is the flue from the furnace or set of furnaces. Between it and the chimney shaft S, I construct a passage in the form of an inverted U, the limbs of which are separated by a partition P. At the bottom of the ascending limb A I place a steam pipe B perforated with numerous holes along its upper side. At the top of the descending limb D I place a water pipe W perforated with numerous holes along its lower side.

The products of combustion ascend the limb A becoming mixed with the steam from the pipe B which by ejector action promotes their flow. After passing over the crown of the partition P they receive a shower of water from the pipe W which condenses the steam and causes deposit of the carbonaceous, sulphurous and other impurities from the products of combustion, which then pass away

by the shaft S comparatively freed from black and noxious matters. The deposited matters collect with the water at the bottom of the limb D, whence they are carried away by a drain E.

The partition P is preferably made double as shown, so that there is little conduction of heat from A to D. As the gaseous fuel is in the descending limb D colder and therefore denser than in the ascending limb A, the preponderance of the former adds to the force of the chimney draft. By increasing the height of the limbs A and D this preponderance may be made sufficient to produce the necessary draft without requiring a chimney for that purpose, especially as the ascending steam in the one limb and the descending water in the other limb aid in promoting the flow of the gaseous fluid.

Having thus described the nature of this invention, and the best means I know for carrying the same into practical effect, I claim—

An apparatus for removing impurities from smoke, the same consisting of a continuous passage made in the form of an inverted U, the vertical walls thereof being separated by a partition having the form of an inverted U, a steam-pipe arranged in the lower part of the ascending branch of said passage and provided with steam exits which discharge upwardly, and a water-pipe arranged in the upper part of the descending branch and having water exits which discharge downwardly thereby maintaining and aiding the draft and condensing all the steam with a minimum discharge of water, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 9th day of May, A. D. 1893.

EDWARD E. DULIER.

Witnesses:

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