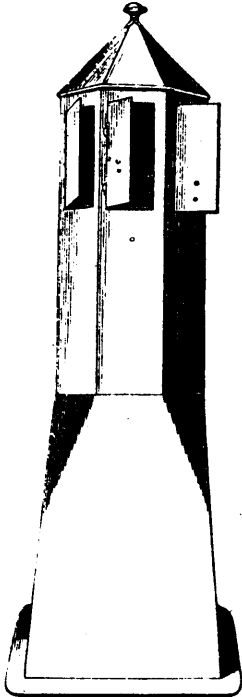


### NEW SMOKE PREVENTER AND VENTILATOR.

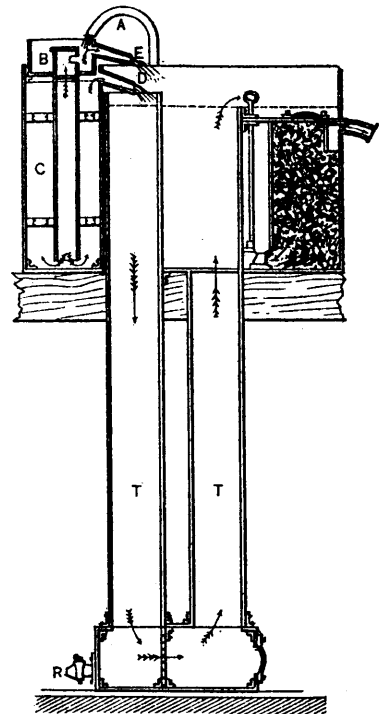
"The Puff" Smoke Preventer and Ventilator is a new patent contrivance in the form of a metal cowl, designed expressly for the cure of smoky chimneys and for the complete ventilation of rooms. It is brought out and manufactured by Messrs. John Badger & Co., of Stephenson Street, Birmingham; its action is without noise, and the chief characteristics is simplicity, efficiency, and economy. As will be seen from our engraving, the new patent smoke preventer is of hexagon shape, the principle of the invention being clearly indicated in the accompanying section. There are six little hinged doors in the upper part of the cowl, each door being connected with the one exactly opposite, by means of an iron



rod, so that which ever way the wind blows, it closes the doors on that side, and automatically opens those on the opposite side, thus giving free vent to either smoke or impure air. It is found that the puff from a hand bellows is sufficient to open and close the doors; and it necessarily follows that when the wind blows on the side to close doors A B C, it must open doors D E F. The action of the mechanism is uniform and satisfactory, and there is nothing about the contrivance to get out of order. Immediately below the hinged doors, in the interior, cross-bars are placed which prevent any damage being done to the cowl by sweeping, &c. The low price at which Messrs. Badger's new smoke preventer is put into the market goes far to recommend it.

### DANCHELL'S FILTER.

A new filter is just announced in England, under the name of Danchell's, which, it would seem, is intended to act upon hard water and soften it, as well as to remove the impurities which it contains. To free the water from the organic impurities always contained in it, the animal charcoal is used in a powdered, instead of the granulated state in which it is generally made use of, the inventor having found (according to his own statements) that in this condition it is sixteen times more effective. This powder is not, however, used as a filtering, but only as a purifying medium, the filtering—that is, the removal of suspended matter, being a distinct operation. This powder is constantly moved by the entry of the water with which it is intimately mixed, and thus destroys so much more effectively some of the impurities contained in solution. The renewal of the powder



*The Danchell Filter.—Vertical Section, showing the Construction.*

is very simple, the spent powder being drawn off by a tap at the bottom of the apparatus, and fresh powder being supplied through a manhole at the top.

The filtering is performed by a series of diaphragms, each consisting of two discs, not joined, and formed of any convenient filtering material—such as calico, felt, or other fabrics. These discs are fixed into a central tube provided with holes, through which the liquid passes off, after having gone through the filtering cloths. In this respect it resembles the French filter. The pressure of the water, whatever it may be, can only press the two discs closely together, but cannot injure them, for as there is no solid substance under them, as in the cases where filtering cloths are fixed upon perforated plates, they give easily to any extra strain through their own elasticity. One important feature of the arrangement of this filter is the fact that the water descends in one part and ascends in another, after having deposited its impurities in the lowest level. When the water is very hard, it is softened by placing into this lower part a composition which reduces the carbonate of lime contained in it and causes it to deposit.

The illustration shows the general arrangement of this filter. The water is brought to it by a tap, A, and passes into a chamber, B, situated in the highest level. From this it flows by two channels, whose area can be regulated according to the hardness of the water. One of these streams goes down to the bottom of the vessel C, dissolves a part of the composition placed there, and passes out through the opening D. The other part flows through the opening E into the vertical tube T. A reaction is produced by the mixing of the two waters, and the precipitation of the carbonate of lime insures the latter falling to the bottom. The water then filters through this layer of chalk and rises in the tube T' up to the level of the charcoal box out of the apparatus. The inventor, who is from the continent, has but recently introduced the article into England. Owing to the bad quality of water upon the Continent of Europe, the subject of water filtration has received much more attention from inventors than in this country, which may almost be said to be the land of pure water.