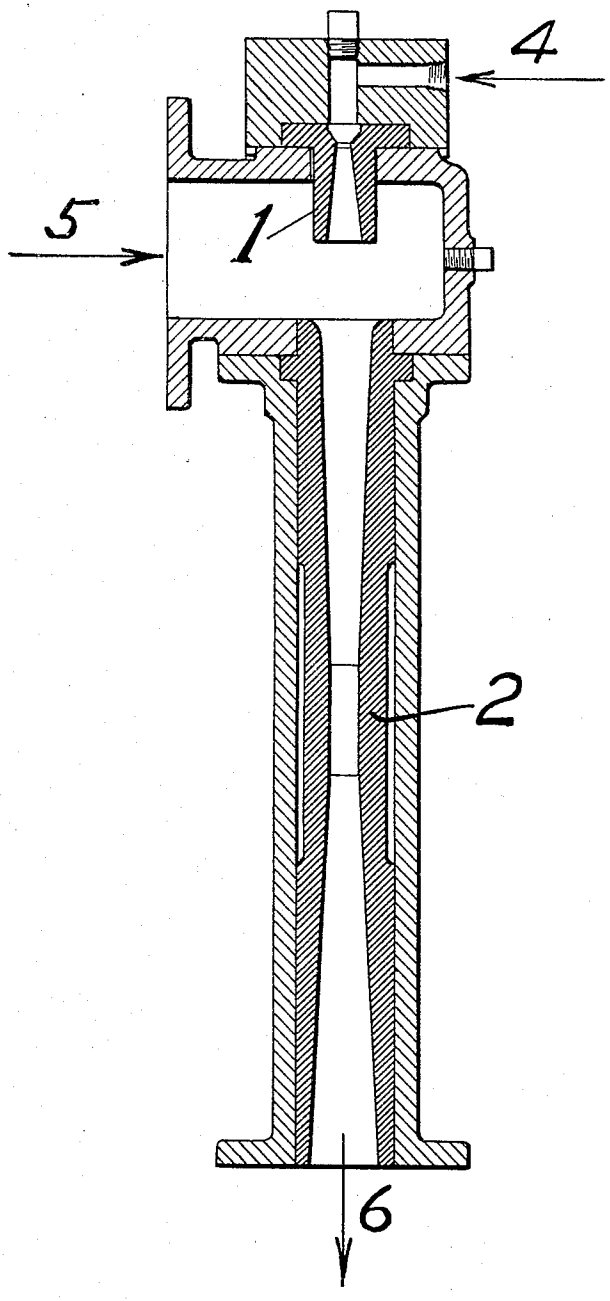
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STEAM JET EXHAUSTER

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WITNESS:

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STEAM JET EXHAUSTER

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1 Claim. (Cl. 230—95)

Steam jet exhausters are operated by steam and they operate upon vapors. The nozzles and diffusers of steam jet exhausters are made of metal. The use of steam jet exhausters is prescribed, they cannot be operated with corrosive vapors, such for example as contain hydrochloric acid, because while metal nozzles and diffusers withstand the erosive action of wet steam jets, they will not withstand the corrosive action of acid vapors. Corrosive vapors pit or mar the metal surfaces of nozzles and diffusers giving rise to eddies and otherwise interfering with flow so that the steam jet exhausters fail to function properly. In fact, as far as I know, steam jet exhausters are not in commercial use where corrosive vapors are to be handled by them.

Attempts have been made to discover or provide a metal or alloy or other material for use in the nozzles or diffusers which will withstand both the erosive action of the wet steam and the corrosive action of acid and other vapors. These attempts have been commercially unsuccessful because the suggested metals or alloys will withstand the erosive action of the jet of wet steam, but they will not withstand the corrosive action of vapors, such as hydrochloric acid. Glass has been suggested but its coefficient of heat expansion and the coefficient of heat expansion of the metal shell of the parts differ and for that reason, and because glass lacks mechanical strength, it cannot be machined and is not useful for steam jet exhausters.

The principal object of the present invention is to fulfill a recognized want and to provide a steam jet exhauster that will meet the commercial requirements of cost and will operate in connection with corrosive and acid vapors.

The invention is based on the unobvious discovery that steam jet nozzles and diffusers, if made of carbon, will resist the erosive action of wet steam and the corrosive action of acid vapors. The invention is based on the further discovery that carbon can be obtained upon the market in a dense form which can be readily machined and of which the coefficient of heat expansion is negligible. Otherwise stated, the invention is based on the discovery that carbon possesses properties not generally understood or known which, when it is employed as a nozzle or diffuser for a steam jet exhauster, extend the field of usefulness of that apparatus.

The described substitution of carbon for metal or glass in the nozzles and diffusers of steam jet exhauster is not a mere substitution of one material for another because carbon develops new uses for steam jet exhausters and because carbon possesses the not generally known property of resisting corrosive action of acid vapor in the presence of wet steam as well as other expected properties which are useful in the application of carbon to use in the environment which I believe to be new.

The invention consists in a steam jet exhauster having a nozzle and a diffuser of carbon which adapts the exhauster to use with acid corrosive vapor.

The invention also comprises the improvements to be presently described and finally claimed.

The drawing comprises a single figure illustrative of the invention.

In the drawing, 1 indicates a nozzle of carbon and 2 indicates a diffuser of carbon. 4 is the steam inlet, and 5 is the vapor inlet, and 6 is the exhaust.

In operation the nozzle 1 and the diffuser 2 are subjected to erosive action of wet steam supplied at 4 and simultaneously to the corrosive action of acid vapor entering at 5. It is essential to the proper operation of the device that the surfaces, and more particularly the surface of the diffuser, be not pitted or marred. In making the nozzle 1 and diffuser 2 of carbon I avail myself of the property, which I believe I was the first to discover, of resisting the erosive action of wet steam in association with corrosive vapor in a steam jet exhauster, and by the use of carbon in the nozzle and diffuser I make the steam jet exhauster work in connection with acid corrosive vapor and thereby adapt it to new and important uses. In jet exhauster work the steam and corrosive vapor are at high temperature for example and not by way of exact imitation above 350° F. The carbon employed is hard and dense and can be obtained on the market. One way of ascertaining whether it is suitable for the purpose is to machine it.

I claim:

A stem jet exhauster having a nozzle and diffuser of carbon which adapts the exhauster to use with acid corrosive vapors in association with wet steam and at high temperature, such as 250° Fahrenheit or more.

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