

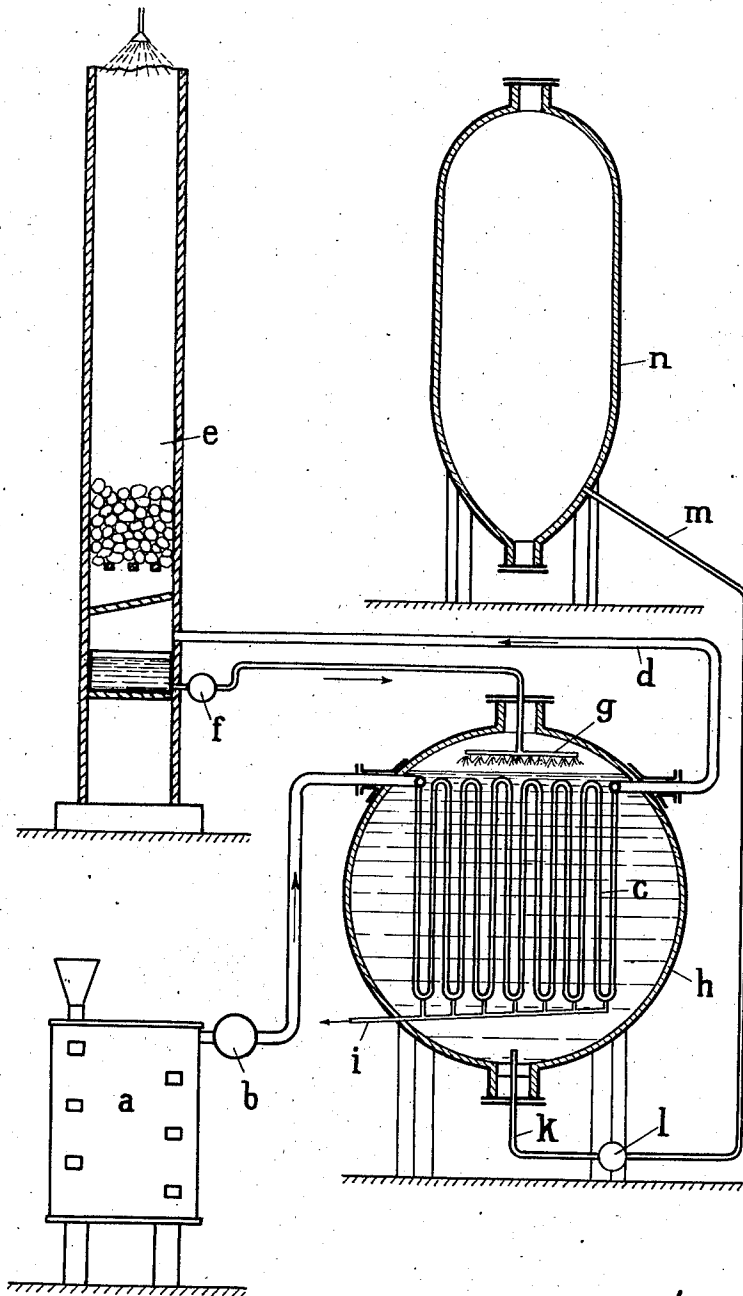
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H. CLEMM ET AL

METHOD OF UTILIZING WASTE HEAT FROM GAS

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UNITED STATES PATENT OFFICE.

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METHOD OF UTILIZING WASTE HEAT FROM GAS.

Application filed April 3, 1922. Serial No. 549,190.

To all whom it may concern:

Be it known that we, HANS CLEMM and ADOLF SCHNEIDER, citizens of Germany, residing, respectively, at Mannheim-Waldhof and Kehlheim, Germany, have invented certain new and useful Improvements in Methods of Utilizing Waste Heat from Gas; and we do hereby declare the following to be a full, clear, and exact description of the invention; such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in methods of regenerating waste heat of the gases coming out of sulphur-kilns, pyrite-kilns or other furnaces. Where it is necessary to cool the gases which are coming from combustion and similar apparatuses, ordinarily cooling water is sprinkled over the pipes or other heat exchanging members of a cooling system traversed by the gas to be cooled, and the major part of the heat taken up by the water is wasted. In addition, means must be provided for cooling the heated water before it can be used again.

The object of the improvements is to provide a method of cooling gases generated in sulphur-kilns or the like, by means of which the waste heat of these gases is regenerated. With this object in view, our invention consists in cooling the hot gases by means of fresh sulfit lye, and using the said heated sulfit lye, if necessary after further heating the same, for boiling the cellulose. In the practice of the invention, the cooling apparatus is traversed by the hot gases, such for example as gases from iron pyrite furnaces, and it is brought in contact with the fresh lye, such as sulfit lye, which is forced under pressure through closed cooling chambers provided in the apparatus. Thereby, any loss or noxious change of sulphurous acid by heating the lye, is avoided. The heated lye is directly supplied to the boiling apparatus filled with wood or it is first further there within a suitable apparatus.

For the purpose of explaining the method according to the invention, an example embodying a device for exercising the same is

shown in the accompanying drawing, in which the same reference characters have been used to indicate corresponding parts.

In the example shown in the drawing, *a* designates a sulphur-kiln or pyrite-kiln, the gases of which are forced under pressure through cooling pipes *c*, arranged in a lye pressure receptacle *h* by means of a pump or ventilator *b*.

The gaseous SO₂, cooled in the cooling pipes *c*, is led through the pipe *d* into the lye-tower *e*. In this tower, the SO₂ is converted into sulfit lye, which is pressed into the receptacle *h* by means of a pump *f*. For instance, the lye may be introduced into the gas-steam-room of the closed pressure receptacle *h* by means of an atomizer *g* or immediately into the lye, contained in the receptacle.

Accordingly, the lye is heated in the receptacle *h* under pressure. Simultaneously, the hot SO₂ coming out of the sulphur-kiln *a* is profitably cooled. Till now, there was used water for this cooling of the hot SO₂, whereby a great loss of water and warmth was caused, which is avoided according to applicants' invention. The hot lye which is under pressure may be pumped by means of a pump *l* through a pipe *k* and a pipe *m* into the boiler *n*. The pipe *i* serves for leading off the condensing products.

What we claim is:

The herein-described method of regenerating the waste heat of the gases coming out of sulphur-kilns, pyrite-kilns or other furnaces, which consists in transmitting the heat from the said gases to fresh sulfit lye in a heat-exchanging device through which the lye is forced under pressure, and then conveying said lye into an apparatus for boiling cellulose, all the system containing fresh lye heated or not being completely closed, thus retaining a certain pressure therein for avoiding any loss of SO₂ and any noxious change of the lye by heating it.

In testimony whereof we hereunto affix our signatures.

DR. HANS CLEMM.

DR. ADOLF SCHNEIDER.