No. 705.418. Patented July 22, 1902.

H. A. E. MENNE.

BURNER FOR THE REMOVAL OF HARDENED MASSES IN FURNACES OR THE LIKE.

(Application filed Apr. 14, 1902.)

(No Model.)

Fig. 3

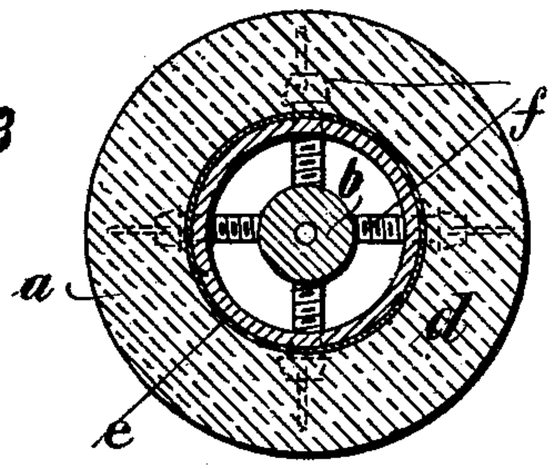


Fig. 1.

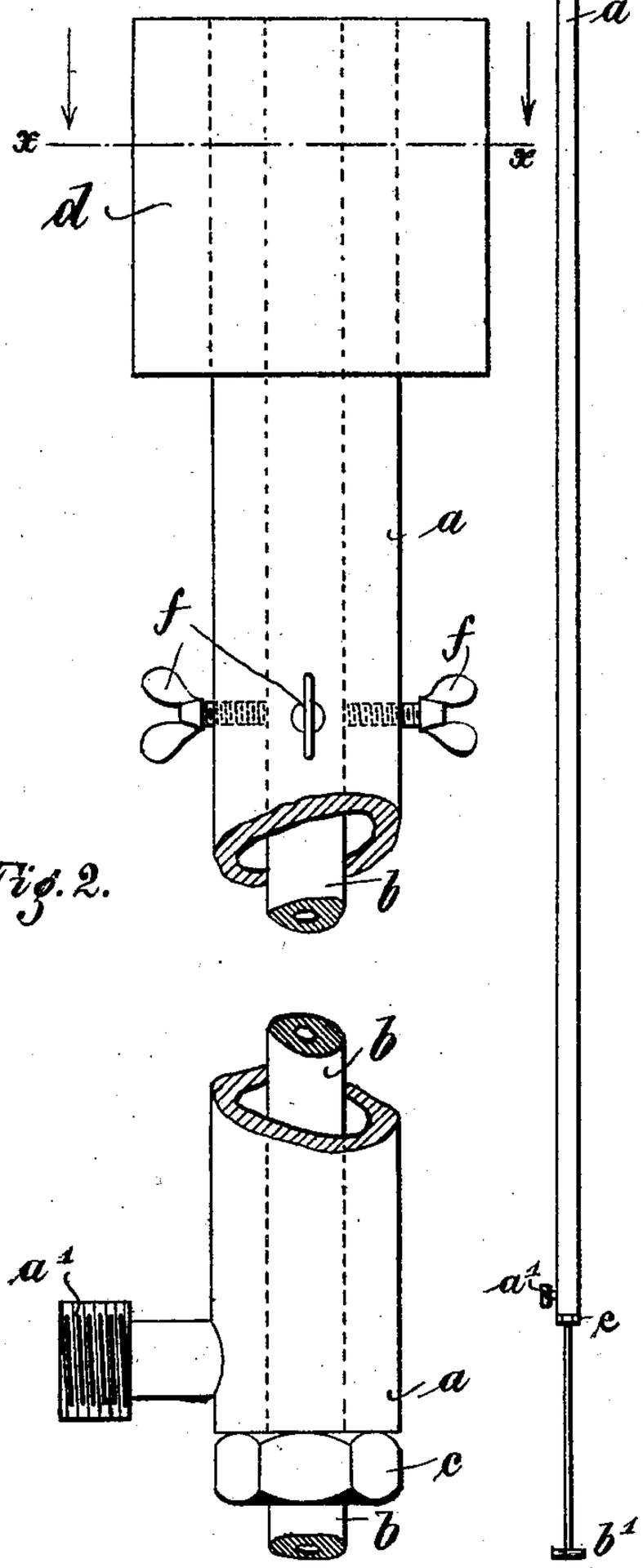
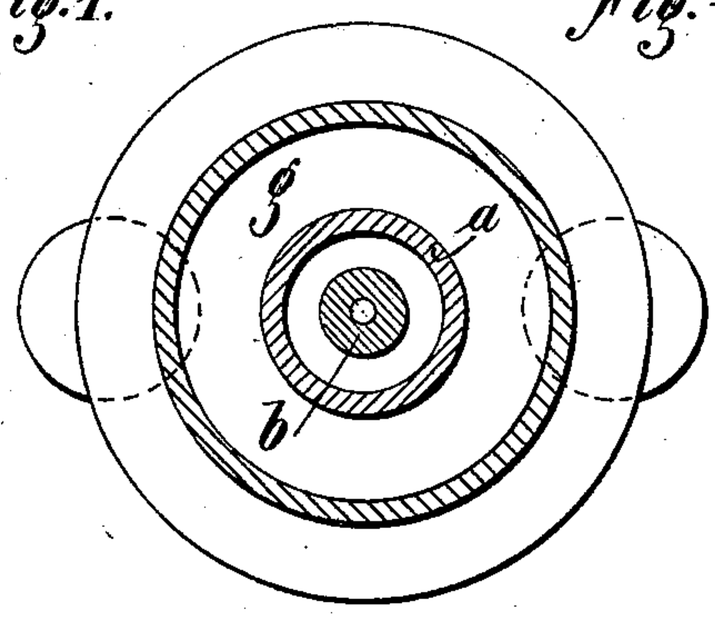


Fig. 2.

Fig. 4.



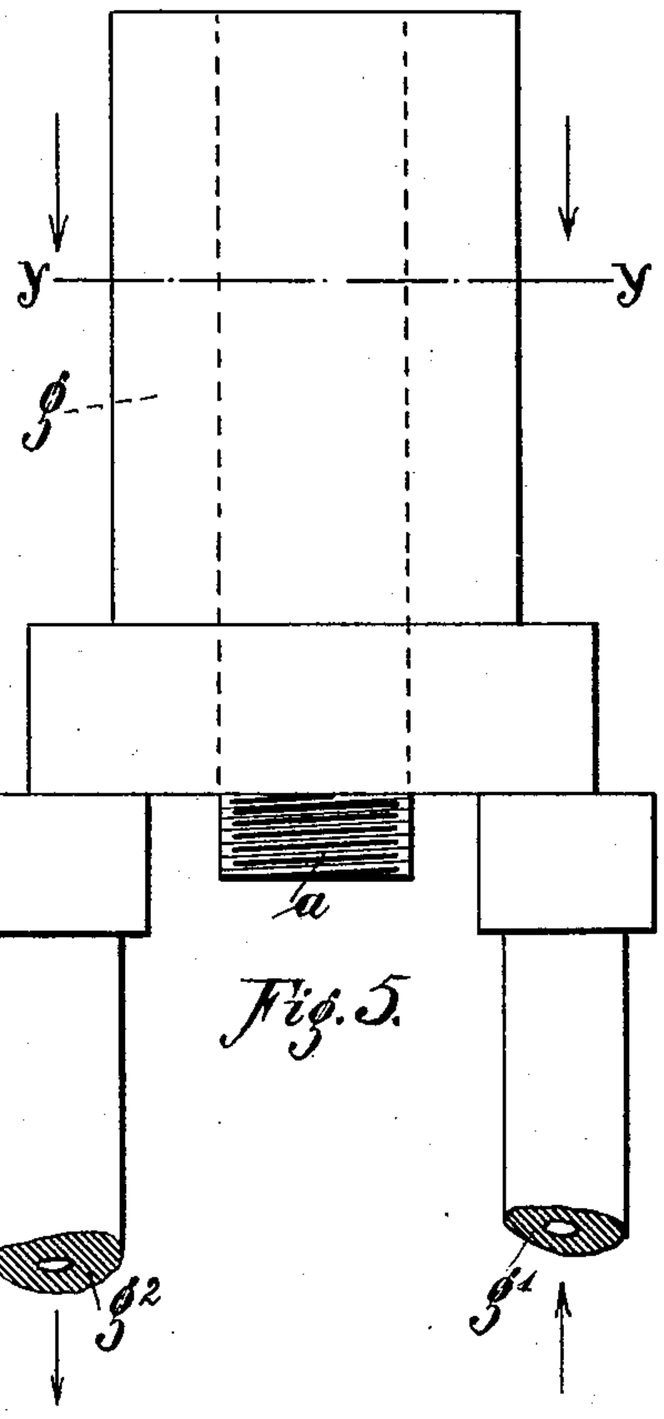


Fig. 5.

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UNITED STATES PATENT OFFICE.

HERMANN ADOLPH ERNST MENNE, OF CREUZTHAL, GERMANY, ASSIGNOR TO CÖLN-MÜSENER BERGWERKS ACTIEN VEREIN, OF CREUZTHAL, WESTPHALIA, GERMANY.

BURNER FOR THE REMOVAL OF HARDENED MASSES IN FURNACES OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 705,418, dated July 22, 1902.

Application filed April 14, 1902. Serial No. 102,886. (No model.)

To all whom it may concern:

Be it known that I, HERMANN ADOLPH ERNST MENNE, a subject of the German Emperor, residing at Creuzthal, Westphalia, Germany, have invented new and useful Improvements in Burners for the Removal of Hardened Masses in Furnaces or the Like, of which the following is a specification.

My present invention relates to a burner or "jet" for carrying out the method for the removal or fusion of hardened masses in furnaces and the like. It is necessary to protect the burner-point, as the latter is subject to the action while in the holes formed in the molten material, which holes gradually increase in depth, of the flame thrown back by the molten mass or of the oxygen gas and the molten material. The jet, therefore, which has only a small amount of protective material, would melt away much quicker than the material treated. The material used for protecting the point of the burner or jet must be a hard, refractory, non-combustible, or only slightly-combustible, material and not influenced by changes of temperature. The burner-protecting means known and used hitherto—as, for instance, steatite, platinum, or the like—do not comply with these requirements.

According to the present invention the fusion of the burner-point is prevented by a casing of refractory and slowly-combustible material—as, for instance, compressed coal, graphite, coke, gas-retort carbon, magnesite, carborundum, or the like—or by providing a water-cooling device around the nozzle.

In the drawings, Figure 1 shows the burner with its point protected. Fig. 2 shows the burner-head and the gas-supply connection on an enlarged scale. Fig. 3 is a section on the line $x\,x$ of Fig. 2 as seen in the direction of the arrows. Fig. 4 is a section on the line $y\,y$ of Fig. 5, which shows a burner-head with a water-cooling device.

In the outer tube a, which supplies the combustible gas—hydrogen-petroleum vapors or the like—is arranged the feed-pipe b for the oxygen gas. The oxygen-tube b is provided at its rear end with a nut c, and the rear end of this tube b is tightened in the outer tube a by means of the nut c.

d is the protective casing, consisting of refractory material. Between the casing and the tube a is a space e, filled with yielding material in order to avoid breakage of the protecting-casing upon the expansion of the tube.

f represents set-screws to position the tube b, and a' b' are the connecting parts for the gas-supply pipes.

The casing or protector can also be made of several single rings of carbon or the like, so as to restrict the melting of the burner-point only down to the next ring in case the first ring should break. As already mentioned, the melting of the burner-point can be also prevented by the use of a water-cooling device, as shown in Figs. 4 and 5. The cooling-water enters at g', passes into the cooling-chamber g, surrounds and cools the tube a, and leaves at g^2. As fresh water is continually admitted, it effects a continuous cooling of the burner-point. This part g may be made of any suitable material.

The connecting unions or pipes for the gas-supply are preferably provided with valves or taps for the regulation of the gas-supply.

The inner tube can be arranged so as to be withdrawn through a convenient stuffing-box, and its discharge-opening is preferably situated about ten millimeters within the opening of the outer tube.

Having now particularly described the nature of my invention and how the same is to be performed, I declare that what I claim is—

1. In a burner, the combination of concentric pipes for conveying fuel and oxygen, yielding material surrounding the outer pipe at its delivery end, and a covering of hard refractory non-conducting material surrounding said yielding material, substantially as described.

2. In a burner, the combination of concentric pipes for conveying fuel and oxygen,

means for centering the inner pipe in the outer pipe, a circular layer of yielding material surrounding the delivery end of the outer pipe and a circular covering of hard refractory non-conducting material surrounding said yielding material, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HERMANN ADOLPH ERNST MENNE.

Witnesses:
WALDEMAR HAUPT,
HENRY HASPER.