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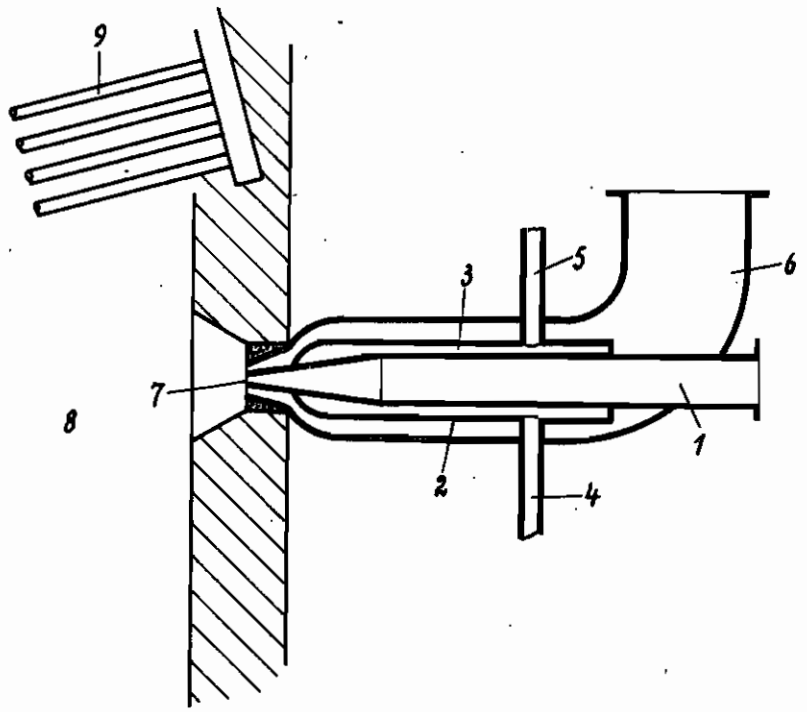

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METHOD FOR OPERATING DUST FUELLED FURNACES

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In the specification of patent application Ser. No. 248 104 a method is described for operating dust fuelled engines, in which the combustion air in the combustion chamber of the engine is heated to temperatures corresponding to and even far exceeding the combustion temperature of the dust, and in which a mixture of air and dust particles having a mechanical ground size of about 4μ and less is blown in the coldest possible condition into the heated air charge. During this operation every individual dust particle is burst explosion-like into very fine particles of about $\frac{1}{50}$th–$\frac{1}{100}$thμ and smaller by the sudden heating of the air or gas particles enclosed in it or of the gas carrier, so that the whole charge can burn quickly and completely. The surprising effect of this measure is explained by the following considerations:—In each dust particle, especially in each coal dust particle, air, resin, paraffin, tar and other rapidly gasifying particles are enclosed. By the sudden heating of the cold dust particles to a very high temperature the enclosed air is precipitately brought to a high pressure and the above mentioned enclosures, such as resin and the like, are suddenly gasified in developing high pressure. In the case of dust particles ground to a fine size, for example of 35–100μ, however, no special effect takes place. But, when using dust particles with a ground size of about 4μ and less such high internal pressures are unexpectedly produced in the dust particles by the sudden heating, that these pressures burst the dust particles which split up into particles with an order of size of about $\frac{1}{50}$th to $\frac{1}{100}$thμ and smaller. The heating must take place as suddenly as possible and to the highest possible temperature; the dust grains should therefore reach the point of combustion in as cold a condition as possible.

It has now been found that the method according to the above mentioned application is also excellently suitable for operating dust fuelled furnaces, in that dust with a mechanical ground size of about 4μ and less is fed to the point of combustion in the coldest possible state. Just as in the method described in the above mentioned application an extremely favorable and rapid combustion is then attained, so that an important improvement as compared with the known methods is also attained in the case of dust fuelled furnaces. The dust burns completely and without leaving any residues.

A dust burner adapted for carrying out the method according to the invention, is illustrated diagrammatically in longitudinal section by way of example in the only figure of the accompanying drawing.

The dust burner consists for example of a conduit 1 for feeding a dust-air mixture which conduit is surrounded by a jacket 2, a hollow space 3 being formed between them. This hollow space has a feed conduit 4 for a cooling medium, such as water, artificially brought to a low temperature, or ammonia which cooling medium can escape from the hollow space 3 through a conduit 5. Additional air is fed through the conduit 6 and at the burner nozzle mouth 7 combines with the dust air mixture from the conduit 1 and flows with the mixture into the combustion chamber 8, which forms for example a component of a water tube boiler 9 only partly shown on the drawing. The dust air mixture in the conduit 1 is strongly cooled on its passage to the nozzle mouth 7, so that the temperature difference between the dust air mixture at the nozzle mouth 7 and the contents of the combustion chamber 8 is very great and the desired bursting of the individual dust particles takes place rapidly and thoroughly.

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