Sept. 17, 1929. J. MILLE 1,728,571

APPARATUS FOR INSURING COMPLETE COMBUSTION IN INDUSTRIAL FURNACES

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Fig. 1

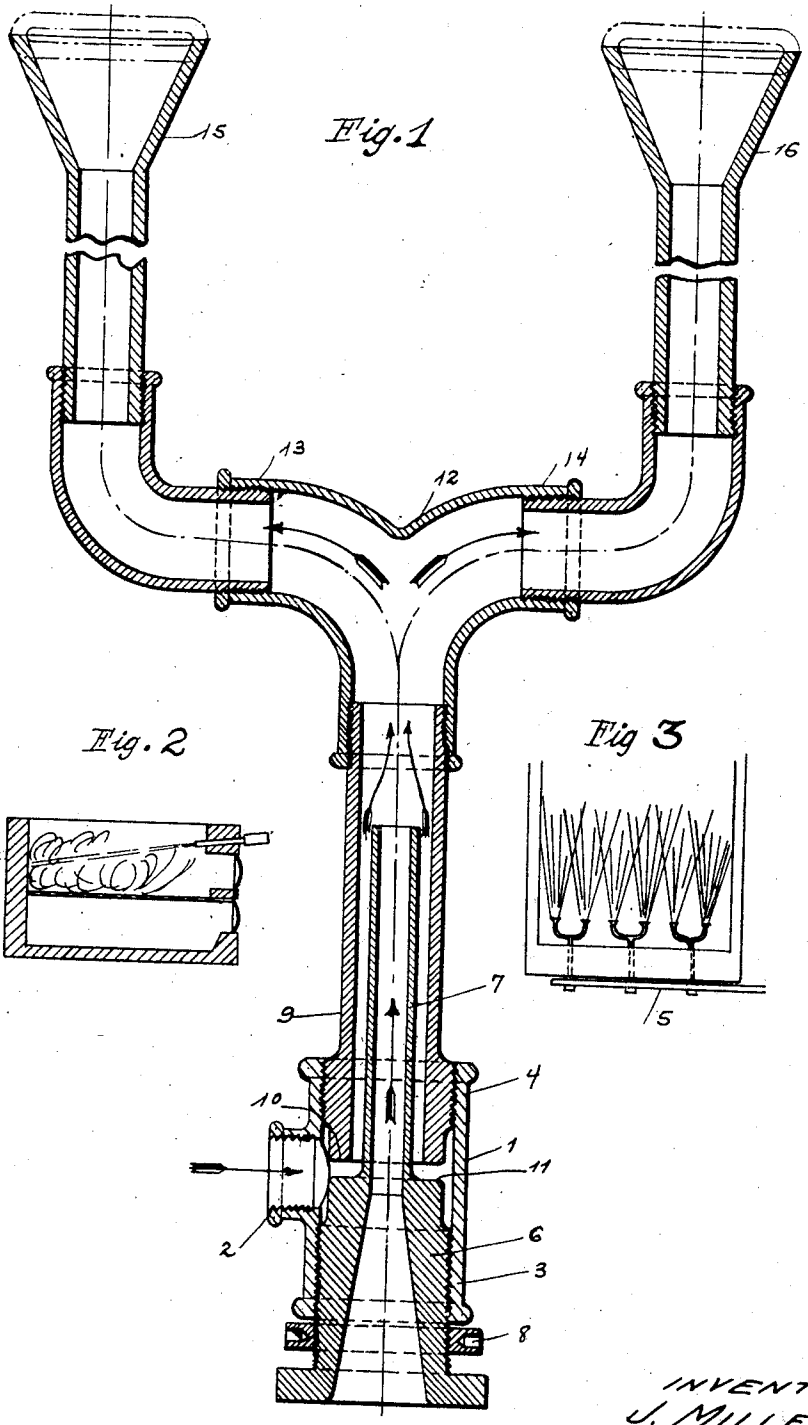


Fig. 2

Fig 3

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APPARATUS FOR INSURING COMPLETE COMBUSTION IN INDUSTRIAL FURNACES

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It has frequently been observed in industrial cities that the air was charged with numerous particles of carbon discharged from furnaces in operation.

These particles are entrained with that smoke. The latter also contains combustible gases which have passed off without being burned.

Such premature discharge of unburned fuel constitutes one of the causes of the low efficiency of industrial furnaces.

The apparatus forming the subject of the present invention renders it possible to augment the efficiency of such furnaces by better utilization of the fuel with complete consumption of the smoke.

The apparatus comprises essentially an injector with pressure steam jets whereby there is injected into the furnace a quantity of air calculated to effect complete combustion of the gases resulting from the distillation of the fuel charged on to the incandescent mass or fuel bed as well as of the smoke arising from the fuel; this complete combustion is obtained by beating down towards the coal and stirring the gases being burned and blanketing them with air and steam.

Further, the steam when it enters into contact with the hot fuel, tends to the formation of water gas the calorific value of which is added to that recovered by the combustion of the smoke.

One form of construction according to the invention is illustrated by way of example in the accompanying drawing in which:

Fig. 1 is a longitudinal section of an injector constructed according to the invention.

Figs. 2 and 3 are diagrammatic views of an installation in side elevation and in plan.

The injector is constituted by a body 1 having three threaded branches 2, 3 and 4.

The branch 2 is connected to a conduit 5 for steam under pressure; the branch 3 is fitted with a coned member 6 for admission of air which is prolonged by a tube 7.

A nut 8 fitted to the exterior of the coned member 6 serves as a means for locking said members 6 in a position to give the best results.

Screwed into the branch 4 is a tube 9 which envelopes the tube 7 and is provided with a seat 10 cooperative with the face 11 of the coned member 6 to regulate the discharge of steam and in consequence the induction of air effected by the injector.

Fixed to the tube 9 is a breeches tube 12 having two branches 13 and 14 terminating in nozzles 15, 16 which distribute the blanket above the grate.

Depending on the power of the boiler and on the grate area an injector will be provided for example for each square metre of grate area in order that the entire mass under combustion will be enveloped by a blanket of air and steam which stirs up the unburned gases and drives them down on to the incandescent fuel where they are ignited, giving up heat units which in previous practice would escape up the chimney.

When the installation comprises a plurality of devices such as described, the latter may be connected to a single conduit fitted with a valve adapted to be operated by the attendant.

The regulation of the delivery of steam in each injector is obtained by adjustment of the coned member 6 which is screwed more or less into the branch 4 in order to vary the spacing of the face 11 from the seat 10 of the tube 7.

It will be understood that the invention is not limited to the particular example described but details may be varied depending on the nature of the installation and in accordance with requirements.

I claim:

1. In an apparatus for effecting the more or less complete combustion of smoke in industrial furnaces, an injector including a cylindrical body formed with a steam inlet, a steam conduit threaded in the body and having its lower end adjacent the steam inlet of the body, and an air conduit having an enlarged portion threaded in the body below the steam conduit and a reduced portion extending longitudinally of and spaced from the walls of the steam conduit, the air conduit being longitudinally adjustable in the body to control the distance between its

enlarged end and the lower end of the steam conduit to thereby control steam admission.

2. In an apparatus for effecting the more or less complete combustion of smoke in industrial furnaces, an injector including a steam conduit, a body in which the steam conduit is adjustable, said body being formed with an opening to admit steam to the conduit, an air conduit adjustable in the body relative to the steam conduit and including a section extending longitudinally of and spaced from the walls of the steam conduit, the adjustable space between the proximate ends of the steam conduit and the air conduit providing a manually controllable steam inlet to the steam conduit, a Siamese coupling at the end of the steam conduit, and delivery pipes leading from the respective branches of the coupling and terminating in spreader outlets.

In testimony whereof I affix my signature.

JULIEN MILLE.