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PULVERIZED FUEL BURNER

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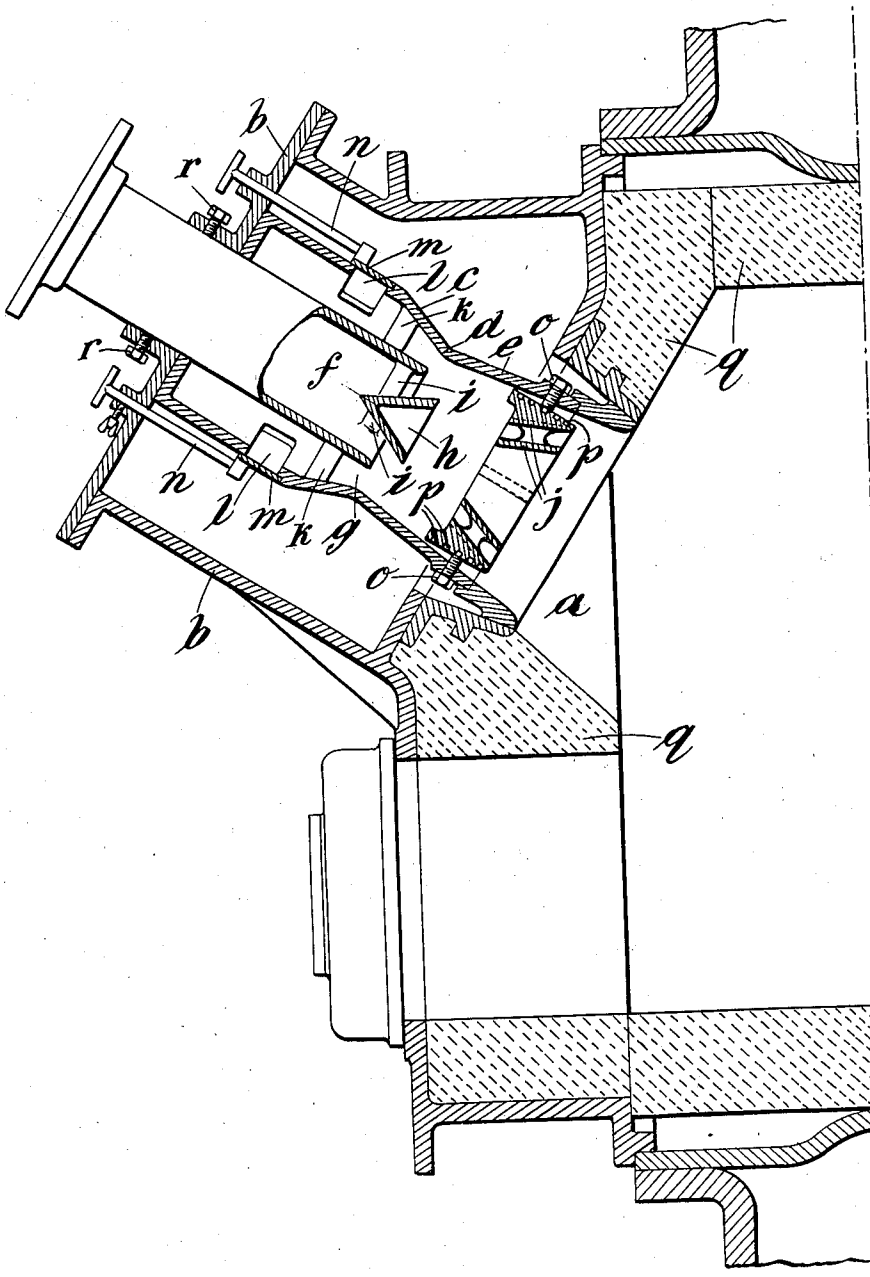

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PULVERIZED FUEL BURNER

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4 Claims. (Cl. 110—104)

This invention relates to pulverized fuel and air mixers and has for its object the construction and arrangement of such a device whereby both the primary and secondary air are discharged through one orifice in such a manner as to deflect the parts of the current of high velocity and set up a compact central stream thus ensuring the finer particles being turned into and maintained within the central zone.

It also consists in means for adjusting the parts of the device so as to set up the best conditions for effecting complete combustion of the fuel in the proper zone of the furnace.

In order that the invention may be the better understood I will now proceed to describe the same in relation to the accompanying drawing, reference being had to the letters and figures marked thereon.

The drawing is a vertical longitudinal sectional view of the device as applied to a furnace.

The drawing shows the furnace mouth *a* of a boiler or other device which is closed by an air casing *b* within which the body *c* of the mixer is mounted. This body *c* has a throat *d* or part of reduced diameter from which the body *c* has a part *e* of gradually expanding size or diameter extending inward.

Within the body *c* of the mixer a central tube *f* is adjustably arranged so as to slide axially in the front of the air casing *b* and is of smaller diameter than the throat or neck *d* thus leaving an annular space *g* and the tube *f* is of such a length as to extend from the front of the casing *b* to the throat *d*. Screws *r* or other equivalent means maintain the adjusted position. The end of the tube *f* is supported on arms *k* carried by the body *c*.

The end of the central tube *f* is provided with a conical device *h* rigidly carried by arms *i* on the tube so as to form an annular discharge from the central tube *f* of the primary air and pulverized fuel.

In the mouth of the device a pair of circular vanes *j* is arranged each being preferably in the form of the frustum of a cone, the vanes *j* being of different diameters so that as a pair they set up a number of annular passages of conical formation so as to give the stream of fuel and air a divergent direction. The secondary air fed to the inside of the air casing in the usual way is admitted to the interior of the mixer body *c* through ports *l* and mixes with the primary air and fuel from the central tube *f* at the throat *d*. The amount of secondary air is regulated by sliding valves *m* coacting with the ports *l* by means of operating rods *n*.

The vanes *j* as a unit are held in position by screws *o* which enter holes *p* in the outside of the unit. A number of holes *p* is arranged in a row to enable the vane unit as a whole to be adjusted axially in the mouth of the mixer.

The ordinary refractory lining *q* is provided in order to protect the air casing and the burner structure.

Under the conditions indicated the finer particles of the fuel are deflected to the centre part of the mixer discharge orifice while the heavy particles are carried outwards by the series of annular passages of conical formation. No swirling action of the fuel is involved in the said device.

I claim:—

1. A pulverized fuel burner and air mixer comprising an air casing adapted to be fitted to the mouth of the furnace, a mixer tube mounted therein having a part of contracted cross-section and an end of gradually expanding size, means for admitting air from the air casing to the inside of the mixer tube, a central tube mounted within said mixer tube and of smaller diameter than the part of contracted cross-section of the mixer tube and of a length to coact with said part to form a constricted annular passage, a conical device, arms on said device holding it fixedly at the end of said central tube to create at said end an annular discharge passage therefrom and a pair of circular vanes of conical form one within the other mounted in the discharge portion of the mixer tube and adapted to give a divergent direction to the main stream of fuel and air.

2. A pulverized fuel burner and air mixer comprising an air casing adapted to be fitted to the mouth of the furnace, a mixer tube mounted therein having a part of contracted cross-section and an end of gradually expanding size, means for admitting air from the air casing to the inside of the mixer tube, a central tube mounted within said mixer tube and of smaller diameter than the part of contracted cross-section of the mixer tube and of a length to coact with said part to form a constricted annular passage, a conical device, arms on said device holding it fixedly at the end of said central tube to create at said end an annular discharge passage therefrom, a pair of circular vanes of conical form one within the other mounted in the discharge portion of the mixer tube and adapted to give a divergent direction to the main stream of fuel and air and means for adjusting the end of the central tube relative to the part of reduced diameter of the mixer tube.

3. A pulverized fuel burner and air mixer com-

prising an air casing adapted to be fitted to the mouth of the furnace, a mixer tube mounted therein having a part of contracted cross-section and an end of gradually expanding size, means for admitting air from the air casing to the inside of the mixer tube, a central tube mounted within said mixer tube and of smaller diameter than the part of contracted cross-section of the mixer tube and of a length to coact with said part to form a constricted annular passage, a conical device, arms on said device holding it fixedly at the end of said central tube to create at said end an annular discharge passage therefrom, a pair of circular vanes of conical form one within the other mounted in the discharge portion of the mixer tube and adapted to give a divergent direction to the main stream of fuel and air, and means for adjusting the pair of circular vanes axially as a unit relative to the discharge end of the mixer tube.

4. A pulverized fuel burner and air mixer comprising an air casing adapted to be fitted to the mouth of the furnace, a mixer tube mounted therein having a part of contracted cross-section and an end of gradually expanding size, means for admitting air from the air casing to the inside of the mixer tube, a central tube mounted within said mixer tube and of smaller diameter than the part of contracted cross-section of the mixer tube and of a length to coact with said part to form a constricted annular passage, a conical device, arms on said device holding it fixedly at the end of said central tube to create at said end an annular discharge passage therefrom, a pair of circular vanes of conical form one within the other mounted in the discharge portion of the mixer tube and adapted to give a divergent direction to the main stream of fuel and air, means for adjusting the end of the central tube relative to the part of smaller diameter of the mixer tube and means for adjusting the pair of circular vanes axially as a unit relative to the discharge end of the mixer tube.

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