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IGNITION SYSTEM FOR BOILERS FIRED WITH LIQUID FUEL

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Fig. 1.

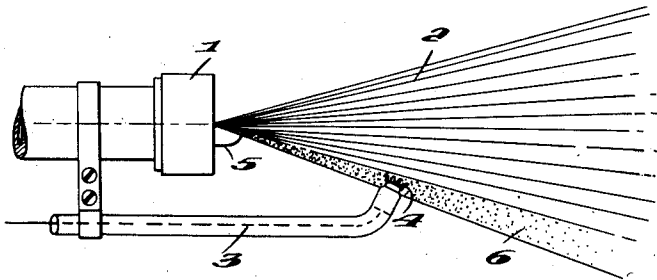
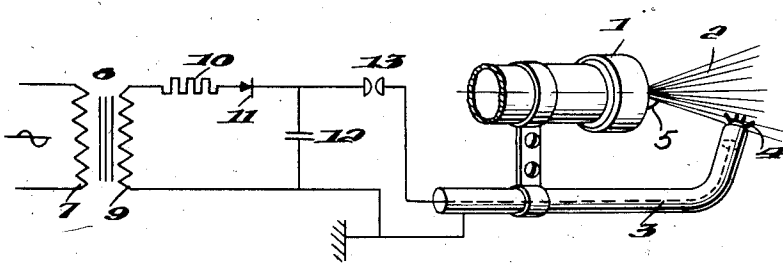


Fig. 2.



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IGNITION SYSTEM FOR BOILERS FIRED WITH LIQUID FUEL

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1 Claim. (Cl. 158—28)

The invention relates to an ignition system for boilers for industrial and/or household purposes, fired with liquid fuel, e. g. oil.

Such boilers are generally fed with oil, which is injected into the boiler by an atomizer, the ignition of the oil taking place with the aid of two electrodes disposed inside the oil jet, between which electrodes a spark with a tension of about 15,000 volts jumps across.

In such high-tension systems very serious difficulties with the ignition were hitherto encountered, which are mainly due to the fouling of the insulators on which the electrodes are mounted, owing to which it will often occur that no ignition spark can be produced any more between the electrodes. This applies in particular to boilers which, after having been fired with oil in order to produce the right temperature, are changed over to firing with pulverized coal, in which case, upon the combustion temperature of the pulverized coal being reached, the oil supply is stopped and the boiler is further fired with pulverized coal. In such cases the ignition system will foul very seriously and, when put into operation again, will fail altogether, because the high-tension current is returned via the fouling layer towards the earth.

An unsatisfactory ignition effect is also obtained because too little oxygen is present in the vicinity of the high-tension spark, since the points of the electrodes are located in the middle of the oil jet.

According to the invention these disadvantages are completely eliminated, such because in such boilers a low-tension ignition system is used, which operates with condenser charge and discharge, the condenser discharge being used for generating a spark in an ignition plug which is equipped with a sparking surface across which the ignition spark passes.

According to the invention the sparking surface is disposed in such a way relatively to the jet spouting from the oil atomizer that this surface is located outside the conical jet. From experiments it has been found that if this sparking surface is located outside the injected oil cone, ignition will not take place under any circumstances. Satisfactory ignition is obtained if means are used through which splashes of oil or similar fuel from the oil jet impinge on the sparking surface of the low-tension ignition plug. These means may consist in a small pin or plate extending into the oil jet, which causes splashes of oil to be hurled from the oil jet, these splashes impinging on the sparking surface of the plug. Such a

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member may be mounted, for example, on the oil atomizer.

The invention is explained more in detail with reference to the drawing wherein:

Fig. 1 shows one embodiment of burner and igniter of the present invention and,

Fig. 2 illustrates diagrammatically an ignition system for the igniter.

In Fig. 1, the numeral 1 denotes the oil atomizer, which injects a conical oil jet 2 into the boiler. To the side of this jet 2 has been mounted a plug 3, at the end of which has been provided a sparking member, which is located outside the jet 2 and generates flame sparks 4. Into the oil jet 2 extends, for example, a pin 5 attached to the oil atomizer 1, which pin causes a series of oil splashes 6 to be deflected from the oil jet, these splashes partly impinging on the sparking member.

Fig. 2 shows a wiring diagram of the ignition system according to the invention. According to this wiring diagram the system is supplied with A. C., and the source of current is connected to the primary winding 7 of the ignition coil 8, whose secondary winding 9 is connected in parallel with the ignition condenser 12 via a resistance 10 and a rectifier 11. This condenser 12 is adapted to discharge via the spark gap 13 through the ignition plug 3.

The resistance 10 and the internal resistance of the rectifier 11 and the coil winding 9 should be adjusted to each other in such a way that with the minimum number of sparks the secondary voltage of the coil is always sufficiently in excess of the sparking voltage of the adjustable spark gap 13. With the maximum number of sparks the internal resistance should be so great that as flat a voltage curve as possible is obtained, so as to cause as low a peak current through the rectifier as possible. The internal resistance of the secondary winding may also be so chosen that the resistance 10 can be omitted.

I claim:

In an ignition system for a liquid fuel burner, in combination, a fuel atomizer nozzle having an orifice for producing a normal cone of fuel particles, a low voltage spark plug of the surface discharge type disposed outside the normal fuel cone, means including a condenser for firing said spark plug, and a pin mounted on said fuel atomizer at one side of said orifice, said pin having the end portion thereof extending toward the axis of said orifice and into said normal fuel cone whereby a portion of the fuel particles are deflected from the normal fuel cone and are directed to the sparking surface of said low voltage spark plug.

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