

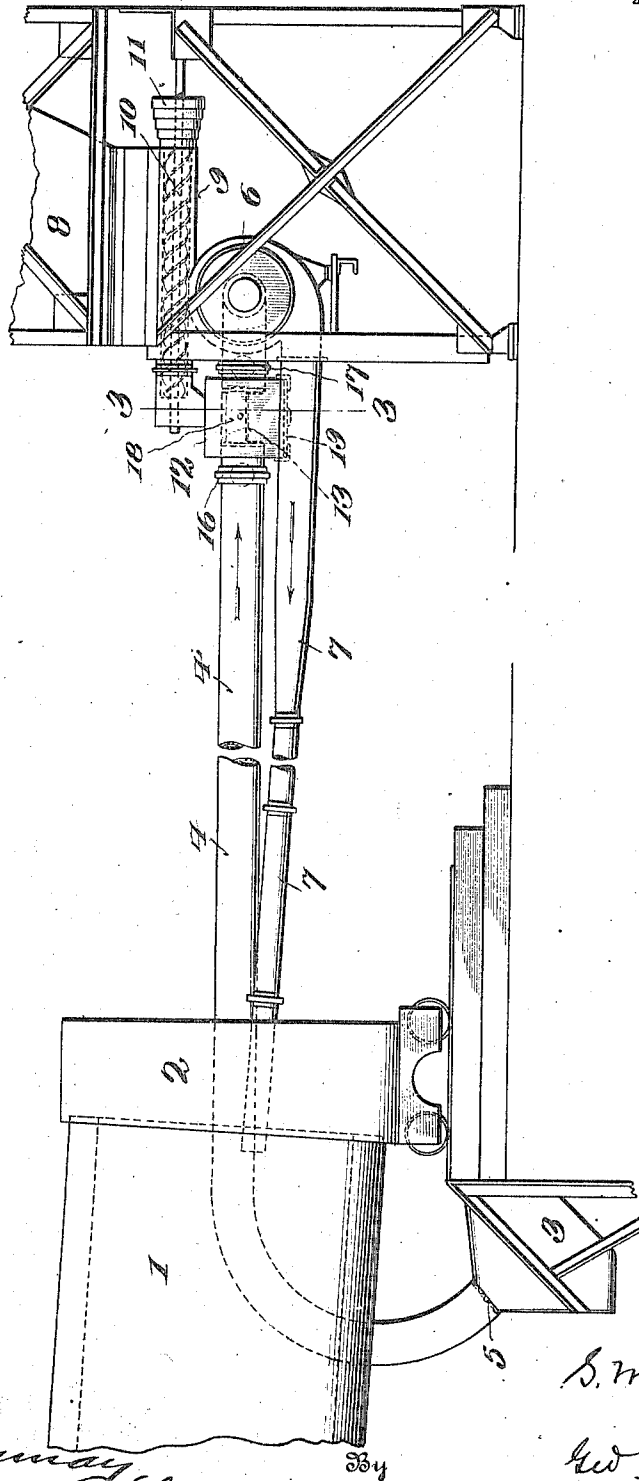
S. M. SEDDON.
 ROTARY CEMENT KILN.
 APPLICATION FILED JAN. 28, 1913.

1,062,259.

Patented May 20, 1913.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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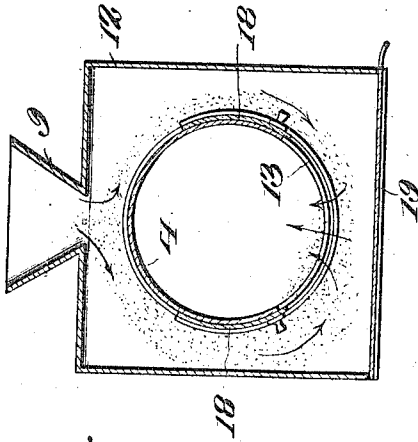


Fig. 3.

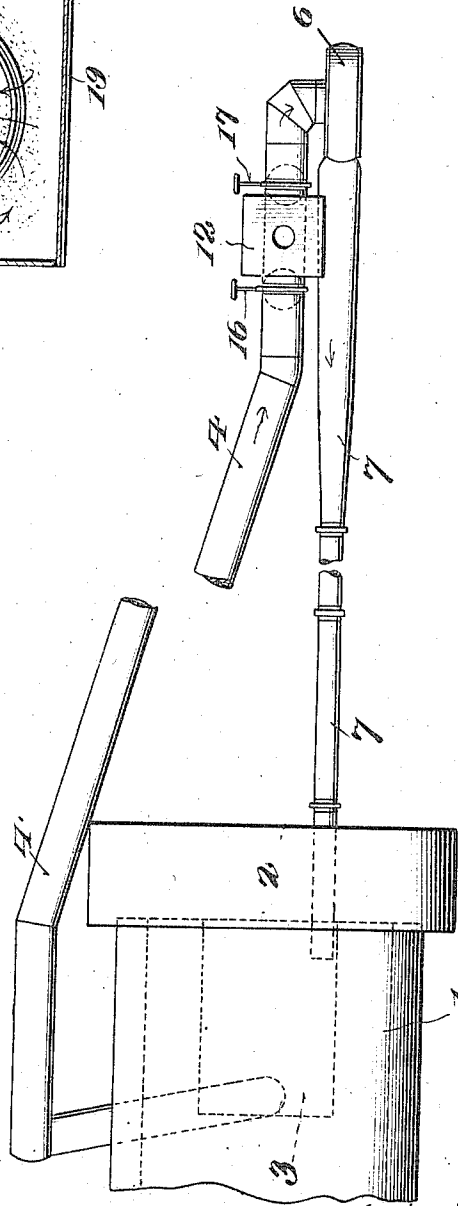


Fig. 2.

Witnesses

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UNITED STATES PATENT OFFICE.

SAMUEL M. SEDDON, OF SALT LAKE CITY, UTAH.

ROTARY CEMENT-KILN.

1,062,259.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, SAMUEL M. SEDDON, a citizen of the United States, residing at Salt Lake City, in the county of Salt Lake and State of Utah, have invented certain new and useful Improvements in Rotary Cement-Kilns, of which the following is a specification.

My invention relates particularly to apparatus for injecting carbonaceous fuel into rotary cement kilns in a powdered or finely divided condition.

The object of the invention is to provide means for thoroughly mixing the fuel with the air prior to the entrance of the same into the suction blower which delivers the fuel into the kiln, instead of feeding the fuel directly into the blower as has been the case heretofore.

A further object is to provide the said mixing means with valves at its inlet and outlet ends and also at the point where the fuel to be mixed with the air enters the air pipe.

These objects I accomplish by the mechanism shown in the accompanying drawing, in which:

Figure 1 is a side elevation of my improved fuel feeding apparatus applied to a rotary cement kiln. Fig. 2 is a plan thereof, the coal bin and its feed screw being omitted. Fig. 3 is a transverse vertical section on line 3—3, Fig. 1.

1 designates the lower end of a rotary cement kiln, 2 is the hood, and 3 the clinker spout. Hot air is drawn from the clinker spout 3 by means of the suction pipe 4 having a screen 5 where it joins the spout 3 to prevent the inlet of any coarse particles. This pipe 4 leads at its opposite end to the suction side of a blower 6 and from the delivery side of the blower leads a pipe 7 which discharges into the kiln 1 through the hood 2 as is usual in this class of fuel feeders.

The fuel bin 8 is provided at its bottom with a discharge tube 9, having a rotary screw conveyer 10, provided with a cone pulley 11 for rotating it at different speeds.

The delivery end of the tube 9 opens downwardly into the top of a mixing box 12 located on the hot air pipe 4 in advance of the blower. As shown, the pipe 4 passes through the mixing box 12 from end to end and the hot air pipe 4 has an opening 13 in

its lower side facing the bottom of the box or chamber 12. The closed top portion of the pipe 4 within the box 12 forms a baffle extending from end to end thereof so that the entering fuel will flow down at opposite sides thereof to the bottom of the box and in so falling down over this baffle, forming part of pipe 4, the fuel will be finely divided and sucked up by the current of hot air passing through pipe 4, and across its opening 13, and the mixture so effected, of hot air and fuel, will be drawn through the blower 6 and forced thereby through the fuel pipe 7 into the kiln. By so mixing the fuel and hot air prior to the delivery thereof to the blower the latter is relieved from the wear due to the direct action of unmixed fuel upon its blades and a far more perfect mixture of fuel and air is effected, since the blower cannot draw unmixed masses of fuel through it and deliver the same to the furnace.

The injector-like action of my mixer 12 upon the divided descending streams of fuel is to suck up the two streams of fuel as they fall down over the closed upper side of the pipe 4 which at this point forms a baffle, as before stated, and in so falling over this baffle-portion all lumps of dust are disintegrated so that only the dust or powdered fuel is sucked up through opening 13 and carried to the blower 6.

A damper 16 is placed in the pipe 4 in advance of the mixing box 12 and a similar damper or valve 17 is placed in the pipe 4 at the opposite side of the box.

The amount of fuel entering the opening 13 may also be regulated by means of a slide valve 18 accessible through a slide 19 which closes the bottom of the mixing box 12.

By properly regulating these valves or dampers 16, 17, 18 the mixture of hot air and fuel may be so regulated that when it is delivered into the kiln it will give a steady flame free from puffing and perfectly adapted to the purpose of the kiln. The valve or damper 16 regulates the strength of the suction required and thus the quantity of fuel mixed with the air, while the damper or valve 17 regulates the capacity of the blower or the quantity of air. Therefore, with these valves it is possible to get any combination of air and fuel desired. By opening the slide 19 the operator may clean out any

heavy particles which may settle in the bottom of the mixing box or chamber 12, such as nuts, bolts, splinters, &c.

By actual test I find that with my above described apparatus there is effected a very large saving in the amount of fuel consumed over the old apparatus in which the fuel is fed directly to a rotary blower and thence to the kiln or where an injector is used to feed the fuel and air directly to the kiln. Moreover, the time necessary to effect the proper burning and dropping of rings is greatly lessened.

While the fuel employed is preferably powdered coal, I may employ a liquid hydrocarbon, as my mixer will thoroughly mix this kind of fuel with air, as the liquid will flow down over the closed side of the pipe 4 and be sucked up by the blast there-through just as is the coal dust.

It will, of course, be understood that the baffle portion of the pipe 4 within the mixing box or chamber may or may not be an integral portion of the pipe, as it is obvious that the ends of the box may be secured to abutting ends of the pipe 4 and that the baffle with the opening in its under side may be a separate element.

While I have shown and described my invention as applied to a rotary cement kiln, it is obvious that it may be employed in feeding fine fuel to other combustion chambers.

What I claim is:

1. In a rotary cement kiln, the combination with a hot air suction pipe leading from the clinker spout, a fuel pipe leading to the kiln, and a blower connected at its inlet or suction side to said hot air pipe and at its outlet to said fuel pipe, of a mixing chamber communicating with the hot air pipe and having means for effecting the subdivision of the fuel and the intermingling of the hot air therewith, and means for delivering the fuel to said mixing chamber from which it is exhausted by the current of hot air, and mixed therewith prior to its entrance into the blower.

2. In a rotary cement kiln, the combination with a hot air suction pipe leading from the clinker spout, a fuel pipe leading to the kiln, and a blower connected at its inlet or suction side to said hot air pipe and at its outlet to said fuel pipe, of a mixing chamber incorporated in the hot air pipe, a baffle section open at its lower side next to

the bottom of the chamber, and a fuel inlet in the top of the chamber over the said baffle section.

3. In a rotary cement kiln, the combination with a hot air suction pipe leading from the clinker spout, a fuel pipe leading to the kiln, and a blower connected at its suction side with the hot air pipe and at its outlet or exhaust side to the fuel pipe, of a fuel mixer incorporated in the hot air pipe in advance of the blower to thoroughly mix the fuel and hot air prior to the entrance thereof into the blower, and a fuel supply for the said mixer, and valves or dampers at the inlet and outlet sides of the fuel mixer.

4. In a rotary cement kiln, the combination with a hot air pipe leading from the clinker spout, a fuel pipe leading to the kiln, and a blower connected at its suction side with the hot air pipe and at its outlet or exhaust side to the fuel pipe, of a fuel mixing box or chamber incorporated in the hot air pipe and provided in its top with a fuel inlet, a baffle in the box or chamber below the said inlet down opposite sides of which the fuel runs to the bottom of the box from which it is sucked by the current of air through the hot air pipe, and a valve for regulating the outlet from the box or chamber to the said hot air pipe.

5. The combination of a fuel mixing chamber having a fuel inlet in its top and air inlet at one end, a fuel outlet at its opposite end, and a longitudinal baffle section between said end openings and down opposite sides of which the fuel may run, with a blower connected at its suction side with the outlet side of said mixing chamber, and a fuel delivery pipe leading from the exhaust side of the blower to the point of combustion.

6. A fuel mixing chamber for kilns comprising a box or receptacle having end openings and a fuel supply in its top, and an air suction pipe leading through the box or receptacle under its fuel inlet and having an opening in its lower side for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL M. SEDDON.

Witnesses:

G. A. MARR,
F. B. CRITCHLOW.