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J. S. WENTZ.
CEMENT KILN.

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Fig. 1.

Fig. 2.

Witnesses:

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This technical drawing illustrates a mechanical linkage system, possibly a component of a steam engine. It features a horizontal beam with weights F and F' at its ends. A curved lever arm, labeled a and a' , is pivoted to the beam at points f and f' . The lever arm is connected to a vertical rod e and e' , which is in turn connected to a piston rod i and i' . The diagram is annotated with various letters and numbers, including f , f' , f_2 , f_2' , f_2'' , f_2''' , and E , indicating specific points and components.

Witnesses:-

Walker P. Pullinger
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JOHN S. WENTZ, OF PHILADELPHIA, PENNSYLVANIA.

CEMENT-KILN.

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To all whom it may concern:

Be it known that I, JOHN S. WENTZ, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain improvements in Cement-Kilns, of which the following is a specification.

The object of my invention is to provide a reciprocating kiln for burning cement, whereby the material is caused to pass through the kiln by a series of intermittent movements. This object I attain in the following manner, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of my improved kiln for burning cement. Fig. 2 is a sectional view on the line 2 2, Fig. 1. Fig. 3 is a view of a detail of the invention, and Fig. 4 is a view of a modification.

A is the body of the kiln.
B is the rear hood or combustion-chamber.
D is the front hood, mounted on wheels d in the present instance, adapted to tracks on a suitable foundation.

d' is a burner, which may be of any suitable type for feeding either powdered coal, oil, or other fuel into the kiln.

In the present instance the kiln A has a flat hearth a and an arched roof a' , as clearly illustrated in Fig. 2. The kiln-body is made of sheet metal having a bed of fire-brick c , forming the hearth proper, and the roof is lined with fire-brick c' .

In order to properly support the kiln A, I mount transverse bars e at intervals under the kiln, and these bars have extensions e' , to which are pivoted suspension-rods f , hung from adjustable eyebolts f' , provided with nuts f'' , as clearly illustrated in Fig. 3. These eyebolts pass through transverse beams F, supported, in the present instance, on posts E, of concrete or other material. The transverse beams are suitably braced by longitudinal beams F' or tie-bars, as desired. By adjusting the nuts f'' on the bolts f' the proper inclination can be given to the kiln A to feed the material gradually forward on the reciprocation of the kiln.

G is a conveyer for feeding material into the kiln, and g is an inclined trough extending into the feed end of the kiln to deliver material from the conveyer to the kiln. The material is discharged through a passage d^2 in the front hood D, and this passage communicates with the pit-passage h in the ordinary manner.

Different forms of mechanism may be used

for imparting a reciprocating motion to the kiln, and in the present instance I have shown in Fig. 1 a shaft I, mounted in suitable bearings on the foundation and having a cam i , with which engages a roller on an arm i' , carried by a rock-shaft I', and on this rock-shaft is another arm i^2 , connected by a rod i^3 to a bracket a^2 , depending from the bottom of the kiln. The cams can be cut in any manner desired to give more or less movement to the kiln; but they are preferably cut to give a comparatively quick movement in one direction, so that the material will be fed intermittently from the inlet end of the kiln to the discharge end, the amount of movement depending entirely upon the amount of throw of the cam and the inclination of the floor of the kiln.

In operation the kiln is reciprocated by the mechanism described, and the material is fed in given quantities through the spiral conveyer down the inclined trough into the feed end of the kiln, dropping upon the hearth or floor. The material is fed forward intermittently while the products of combustion play upon it from the discharge end of the kiln, escaping at the inlet end to the stack B'. The material is finally discharged through the passage d^2 in the front hood D into the clinker-pit. The material will be agitated sufficiently to allow the flame to attack it and to properly reduce it; first driving off the carbonic-acid gas and finally clinkering it.

By making the kiln in the manner shown I can increase its capacity by providing a wide hearth, as clearly shown in Fig. 2, and can bring the roof close to the hearth by making a very shallow arch. Thus the flame is directed throughout its entire course through the kiln in close proximity to the material.

While I have shown the structural beams F F' mounted on piers of concrete E, they may be carried by the framework of the building in which the cement kiln is situated, if desired.

Fig. 4 illustrates a modification in which the front hood D' is made part of the kiln-body A'. An opening d^3 in the lower portion of the hood allows for the free escape of the clinker when it reaches the discharge end of the kiln, and while I have shown the kiln suspended in Fig. 1 it may be mounted on rollers, as shown in Fig. 4, and reciprocated by any suitable mechanism. In this instance

the rails m are mounted upon adjustable bearings m' , or the box for the wheels a^3 may be made vertically adjustable for the same purpose, if desired. I have shown in this instance eccentrics I^2 on the transverse operating-shaft I in place of the cam shown in Fig. 1, and the eccentric-rods i^4 are connected to brackets on each side of the kiln.

I claim—

1. The combination of a cement-kiln having a hearth, a roof inclosing the hearth, means for reciprocating the hearth, means for feeding material onto the hearth at one end of the kiln, and means for discharging it at the opposite end of the kiln, means for feeding fuel into the discharge end of the kiln between the hearth and the roof, and a flue at the inlet end of the kiln communicating with the kiln so that the products of combustion will pass through the kiln between the roof and the hearth and in contact with the material, substantially as described.

2. The combination of a kiln having an elongated body portion, a hearth, a roof inclosing the hearth, means for reciprocating both the hearth and the roof, means for feeding material onto the hearth at one end of the kiln, an outlet for the discharge of material at the opposite end of the kiln, a stack at the feed end of the kiln communicating with the space between the hearth and the roof, and means for admitting fuel into the kiln above the hearth, substantially as described.

3. The combination of a kiln having an elongated body portion, a flat hearth, and an arched roof inclosing the hearth, a series of suspension-rods coupled to the body of the kiln, means for vertically adjusting the suspension-rods, means for reciprocating the entire body portion including the hearth and the roof, means for feeding material onto the hearth, an outlet for the discharge of material from the hearth, means for feeding fuel into the discharge end of the kiln between the hearth and the roof, and a stack communicating with the opposite end of the kiln so that the products of combustion will pass through the kiln in contact with the material, substantially as described.

4. The combination of the body portion of

a kiln consisting of an elongated flat hearth and an arched roof covering said hearth, a rear hood into which the body of the kiln extends, a stack communicating with said hood, means for feeding material into this end of the kiln, a front hood having a discharge-opening, and means for reciprocating the body portion of the kiln, substantially as described.

5. The combination in a kiln, of an elongated body portion having a flat hearth and an arched roof, a series of suspension-rods coupled to the body portion of the kiln, means for vertically adjusting the suspension-rods, and means for reciprocating the body portion, substantially as described.

6. The combination in a kiln, of an elongated body portion having a flat hearth and an arched roof, a fixed rear hood, a chimney connected to said hood, a front hood, a burner projecting through said front hood, means for reciprocating the body portion in both the front hood and the rear hood, carriers for the body portion, and means for vertically adjusting the carriers, substantially as described.

7. The combination in a kiln for burning cement, having an elongated body portion provided with a flat hearth and an arched roof inclosing the hearth, lateral projections on said body portion, suspension-rods connected to said projections, vertically-adjustable eyebolts to which the said rods are connected, a cam, means for driving said cam, a rock-shaft actuated by the cam and connected to the body portion of the kiln, a front hood and a rear hood, means for feeding material onto the hearth of the kiln, a discharge-opening for the escape of material, means for feeding fuel into the space between the hearth and the roof of the kiln, and a stack communicating with the opposite end of the kiln, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN S. WENTZ.

Witnesses:

JOS. H. KLEIN,

WM. A. BARR.