

(No Model.)

3 Sheets—Sheet 1.

W. SONNET.

APPARATUS FOR PRODUCING CEMENT.

No. 371,715.

Patented Oct. 18, 1887.

fig. 1.

WITNESSES:

F. N. Rosenbaum.
Martin Petry.

INVENTOR

Wilhelm Sonnet

BY

Georg & Paegener

ATTORNEYS.

(No Model.)

3 Sheets—Sheet 2.

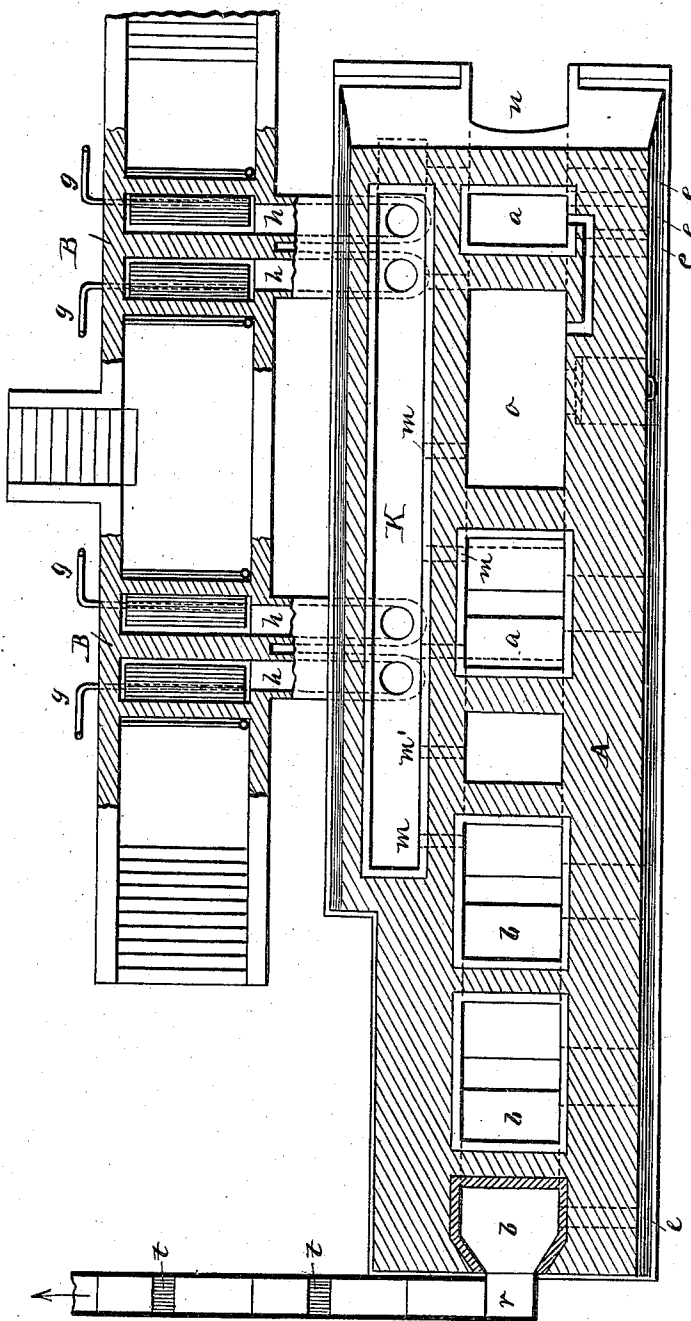
W. SONNET.

APPARATUS FOR PRODUCING CEMENT.

No. 371,715.

Patented Oct. 18, 1887.

fig. 2.



WITNESSES:

F. H. Rosenbaum.
Martin Petry.

INVENTOR

Wilhelm Sonnet
BY *George Raegner*
ATTORNEYS

(No Model.)

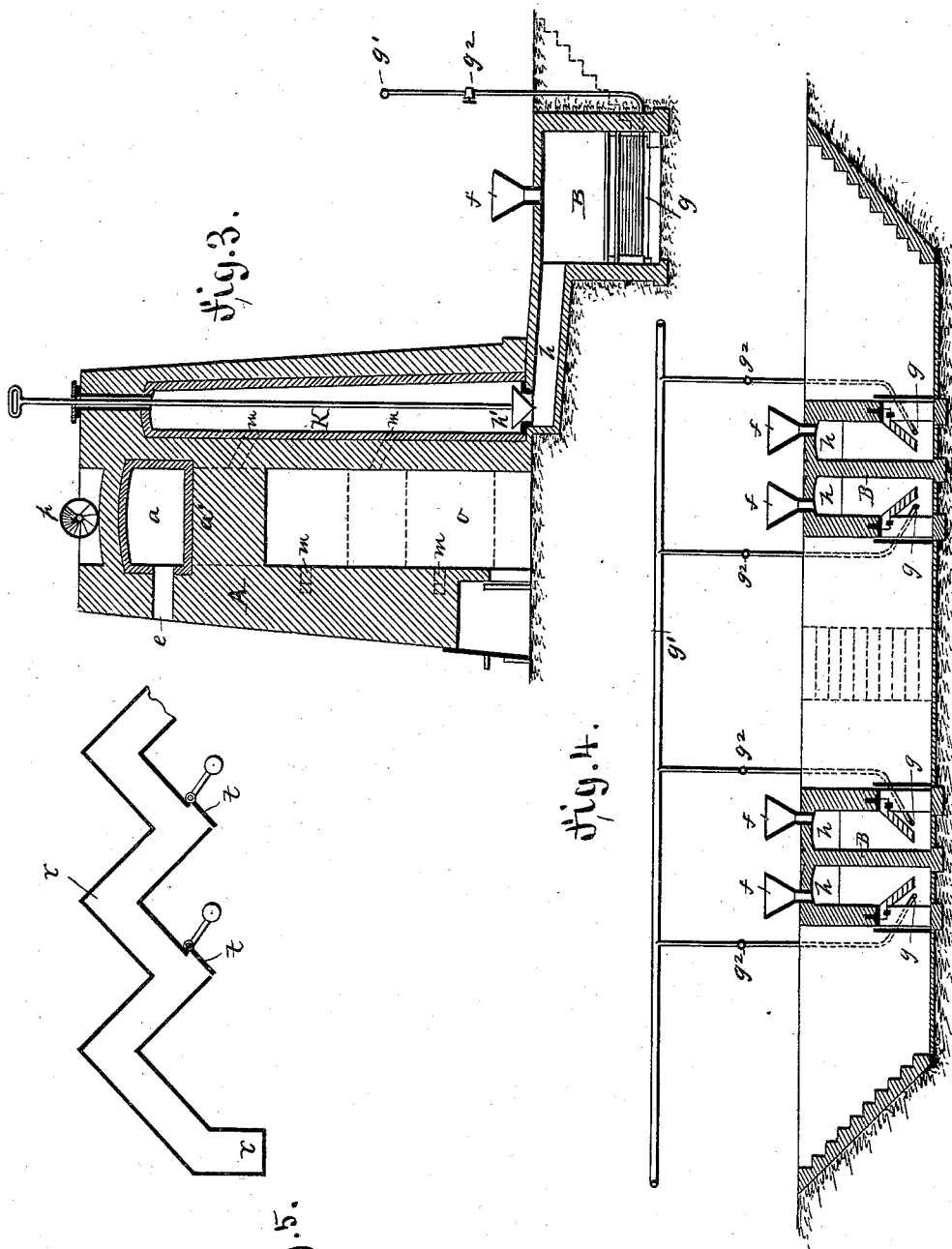
3 Sheets—Sheet 3.

W. SONNET.

APPARATUS FOR PRODUCING CEMENT.

No. 371,715.

Patented Oct. 18, 1887.



WITNESSES:

For. H. Rosenbaum.
Martin Petry.

INVENTOR

Wilhelm Sonnet

BY

Gottlieb Paegemur

ATTORNEYS

UNITED STATES PATENT OFFICE.

WILHELM SONNET, OF BECKUM, PRUSSIA, GERMANY.

APPARATUS FOR PRODUCING CEMENT.

SPECIFICATION forming part of Letters Patent No. 371,715, dated October 18, 1887.

Application filed January 14, 1887. Serial No. 224,323. (No model.) Patented in Germany December 20, 1886, No. 39,803; in France December 23, 1886, No. 180,461; in Belgium December 24, 1886, No. 75,706, and in England December 30, 1886, No. 17,089.

To all whom it may concern:

Be it known that I, WILHELM SONNET, a subject of the King of Prussia, Emperor of Germany, residing at the city of Beckum, in the Kingdom of Prussia, Empire of Germany, have invented certain new and useful Improvements in Processes of and Apparatus for Producing Cement, (which heretofore has been patented to me by the government in Germany, dated December 20, 1886, No. 39,803; in Belgium, dated December 24, 1886, No. 75,706; in England, dated December 30, 1886, No. 17,089, and in France, dated December 23, 1886, No. 180,461,) of which the following is a specification.

This invention relates to an improved method of burning Portland cement, and the furnace used therefor.

The object of my invention is to provide a furnace in which Portland cement can be burned in a pulverized condition, whereby a perfect article is obtained rapidly, many operations are dispensed with, the greater part of the cement is removed automatically from the furnace, and the operators are not exposed to heat as much as they were exposed heretofore.

The invention consists in the construction and combination of parts, as will be fully described and set forth hereinafter, and finally pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of my improved furnace. Fig. 2 is a sectional plan view of the same. Fig. 3 is a cross-sectional view. Fig. 4 is a longitudinal sectional view through the gas-generator. Fig. 5 is a longitudinal sectional view of the exhaust-pipe, looking at it sidewise.

Similar letters of reference indicate corresponding parts.

The furnace A is provided with a zigzag channel extending from the front to the rear. At the front part the shanks of the channel are inclined to each other, as at *a*, Fig. 1, and at the rear part they are vertical and connected at the top and bottom, as at *b*, Fig. 1, so as to compel the flames to take a serpentine course. In the bottom parts of the channel

pockets or receptacles *d* are formed, in which the burnt cement is collected. Numerous openings, *e*, are provided in the sides of the furnace, through which implements can be inserted to loosen the cement which has accumulated on the sides and pockets of the channel during the process. At the side of the furnace A a chamber, K, is provided, into which the gas is conducted, which is generated in the gas-generators, to be hereinafter described.

A series of apertures, *m*, serves to conduct the gas from the chamber K and the air-space *o* in the front part of the furnace into the channel of the furnace at different points. The air in the chamber *o* is heated by the gases passing through the first zigzag part of the channel.

n is a chamber at the bottom and front of the channel, and is closed by a door. The rear end of the channel is connected with a pipe, *r*, which is about three hundred feet long, and which is to be connected with a suction apparatus for creating a draft. The pipe *r* must have considerable length, so as to prevent the overheating of the suction apparatus. As shown in Figs. 2 and 5, the pipe *r* is zigzag-shaped, and is provided at the lower parts with weighted outlet-gates *t*, upon which some of the calcined cement accumulates, and when there is a sufficient quantity upon the gate the same swings down and the cement drops down, the gate being closed automatically by its weight.

The gas-generators B have suitable grates on which the fuel is placed, steam being admitted into the space below the grates by means of the pipes *g*, provided with stop-cocks *g*², which pipes are connected with the main pipe *g*¹. The generator is provided with funnels *f*, for filling them with fuel. The pipe *h* conducts the gases from the generators to the chamber K, as shown in Figs. 2 and 3. Openings at the ends of the channels *h* can be closed by valves *h*¹, connected with rods passing up through the chamber K. A spiral conveyer, *p*, extends entirely over the top of the furnace, and is provided at the front end of the furnace with a chute, *q*, the lower end of which is at

or near the top of the upwardly-inclined shank of the zigzag channel.

The operation is as follows: The lumps of Portland-cement mixture are pulverized so
5 finely that they can pass through a sieve having nine hundred meshes per square centimeter, and the pulverized cement is conducted into one end of the conveyer *p* and carried over the top of the furnace, and thereby heated to
10 about 100° to 150° centigrade. It then passes through the chute *q* into the furnace, and is exposed in its pulverized state to heat at about 2,500° to 3,000° centigrade. The gases from the gas-chamber *K* enter the channel of the
15 furnace at different points, and thus create an intense heat, the particles of pulverized cement drop upon the flame and are calcined, and the different particles of cement unite and drop into the pockets *d*, from which they are
20 removed. Some of the cement drops into the pocket or recess *n*; but this is not fully calcined and must be removed, repowdered, and again conducted into the furnace. The strong draft in the furnace carries the particles of
25 cement through the channel, and those particles which are so light that they cannot drop into the pockets are carried through the channel into the pipe *r* and accumulate in the bends of the same, and some cement is drawn into
30 the draft apparatus.

The operation is extremely simple, as the cement need not be handled. The conveyer carries the pulverized cement over the top of the furnace, the draft carries it through the
35 furnace, and it is only necessary to remove

that part of the cement which is dropped into the pockets or receptacles *d*. The workmen are not exposed to any intense heat; there is no need of forming lumps of cement for the furnace, as was necessary in the old method, 40 and the lumps will not be piled up in the furnace, and the furnace can be stopped for twenty-four hours without cooling perceptibly, thus permitting of the ceasing work on Sundays or holidays.

Having thus described my invention, I claim as new and desire to secure by Letters Patent— 45

1. The combination, with a cement-furnace having a heating-channel, of a zigzag pipe connected with one end of the channel, said zigzag pipe having automatic opening gates at its bottom parts, substantially as shown and described. 50

2. In a furnace for burning cement, the combination, with the heating-channel, of a zigzag 55 pipe, *r*, connected with one end thereof, said pipe having openings opposite the lower ends of its convolutions and in line therewith, gates hinged to said pipe at the upper edges of said openings, and weights connected to 60 said gates for keeping them normally closed, for the purpose set forth.

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

WILHELM SONNET.

Witnesses:

GERARD VON NAWROCKI,
B. ROI.