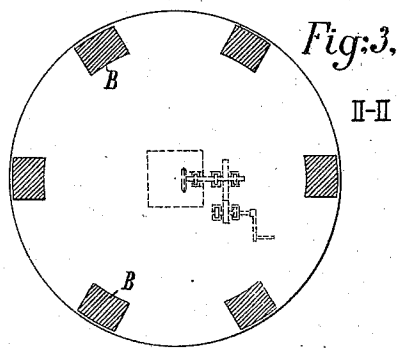
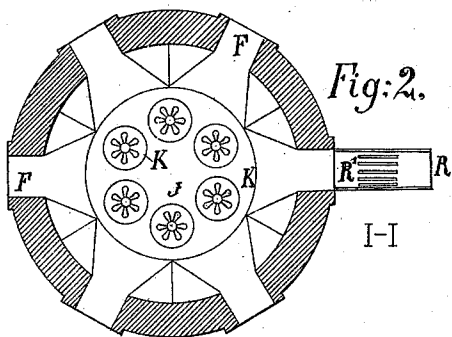
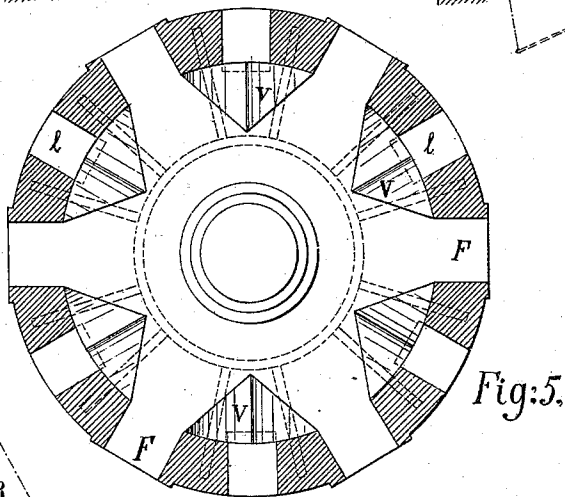
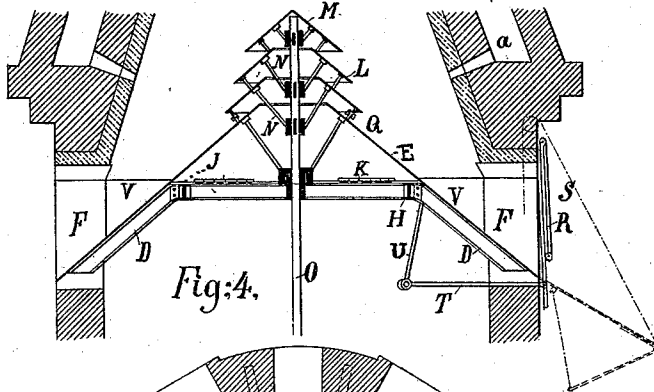
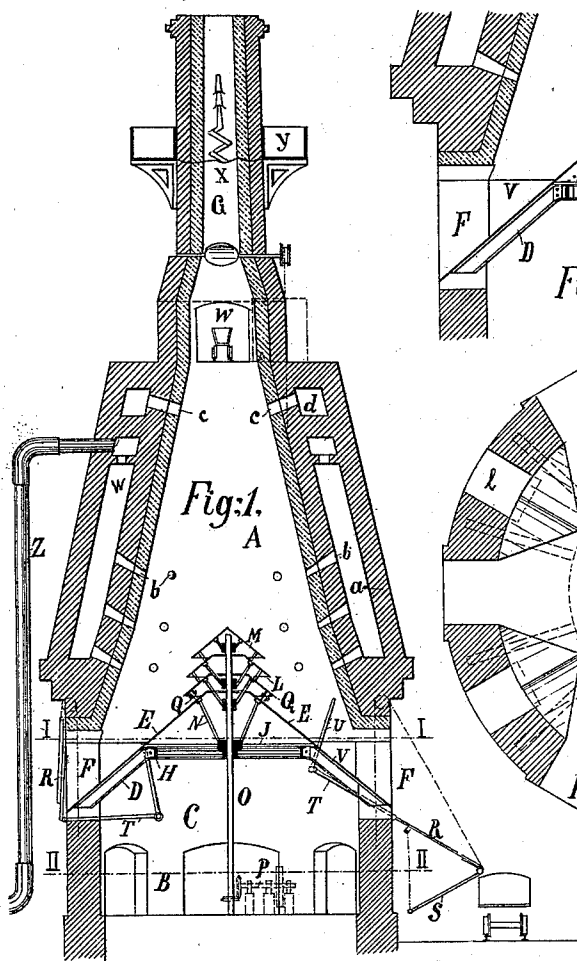


A. DAUBER.
CALCINING FURNACE.

No. 573,140.

Patented Dec. 15, 1896.



Witnesses:
A. Thomas
E. Becker

Inventor:
A. Dauber

(No Model.)

2 Sheets—Sheet 2.

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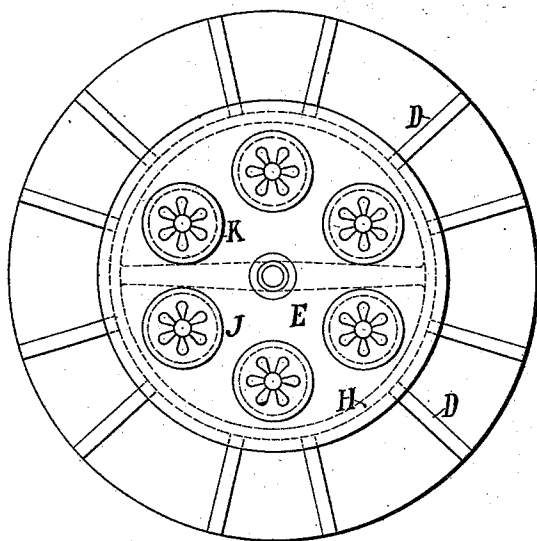


Fig. 6.

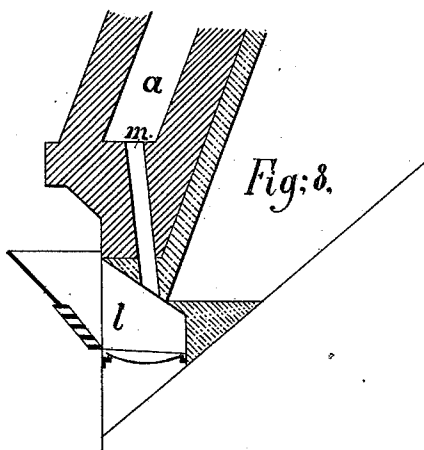


Fig. 8.

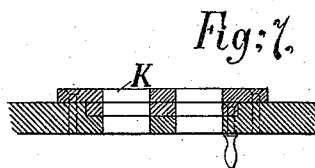


Fig. 7.

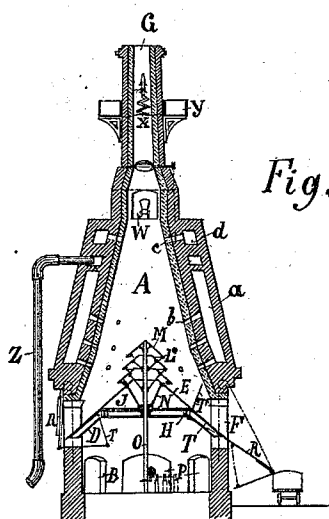


Fig. 9.

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UNITED STATES PATENT OFFICE.

AUGUST DAUBER, OF BOCHUM, GERMANY.

CALCINING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 573,140, dated December 15, 1896.

Application filed January 19, 1894. Serial No. 497,463. (No model.) Patented in Germany March 17, 1892, No. 66,276; in France June 15, 1892, No. 222,351; in Belgium August 12, 1892, No. 100,924; in England September 5, 1892, No. 15,880; in Italy April 10, 1893, No. 33,735, and in Austria-Hungary May 13, 1893, No. 7,461 and No. 49,852.

To all whom it may concern:

Be it known that I, AUGUST DAUBER, a subject of His Majesty the Emperor of Germany, residing at Bochum, in Westphalia, Germany, have invented a new and useful Improvement in Calcining-Furnaces, (for which I have obtained patents in Germany, No. 66,276, bearing date March 17, 1892; in France, No. 222,351, bearing date June 15, 1892; in Belgium, No. 100,924, bearing date August 12, 1892; in England, No. 15,880, bearing date September 5, 1892; in Austria-Hungary, No. 49,852 and No. 7,461, bearing date May 13, 1893, and in Italy, No. 33,735, bearing date April 10, 1893,) of which the following is a specification.

The calcining-furnaces in use for calcining and roasting limestone, cement, gypsum, dolomite, and the like are not able to turn out a uniform and equal product. This causes a double loss. Fuel is wasted and the product is partly of inferior quality, and this is caused by the insufficient and irregular admission of air, and in a cold state of the same, into the material to be treated.

The furnace invented by me for continuous calcining, roasting, and burning of lime, cement, gypsum, dolomite, and other suitable materials answers all the purposes without having the drawbacks of the ordinary furnaces. Its peculiar construction guarantees a practical working, a faultless product, and requires very little fuel.

On the accompanying drawings, Figure 1 is a vertical section of the furnace. Fig. 2 is a horizontal section in the level of the outlet-doors along line II of Fig. 1. Fig. 3 is a similar section of the base of the furnace. Fig. 4 is a vertical section of a part of the furnace on an enlarged scale. Fig. 5 is a sectional plan of Fig. 4. Fig. 6 shows the supporting-girders of the delivery-cone and the air-inlet and regulating valves. Fig. 7 is a cross-section of an air-valve on an enlarged scale. Fig. 8 is a section through an auxiliary fireplace of the furnace. Fig. 9 is a vertical section of the furnace, on a small scale.

The furnace consists of a conical shaft or pit A, built upon a cylindrical or polygonal base C, and pillars B. This base carries on

girders D the delivery-cone E, and above it the conical furnace A is built, having six outlet-openings F and being surmounted by a chimney G.

The girders D support a ring-girder H, which carries the table J with the air-valves K. The delivery-cone E is cut off at its upper part, forming an open truncated cone, and upon this part are fixed the lanterns or caps L L and the closing-cap M, allowing air-passages between them. The delivery-cone is immovable. The caps L L and M are fixed by arms N to a vertical shaft O, so that by means of gearing P at the bottom they may be turned round, if found desirable. The lower cap is therefore provided with rollers Q, which stand upon the cone E. Trap-doors R serve for closing the outlet-openings F. When opened, these doors serve at the same time as chutes for guiding the material into the wagons below them and also as grates for separating ashes and small material from the big pieces. They are therefore provided with slots R'. Counter-doors S are linked to them, which are also made like a grate, but so that the solid bars cover the openings of the doors R when these are closed, as shown in Fig. 4.

In order to prevent the outfall of more finished material than is desired when the doors R are opened, there are bars T so connected to their base that the spikes U, linked to their inner ends, are raised into the furnace through holes provided for that purpose in the cone-plate E, as shown in Fig. 1 on the right side, and which thus prevent the sliding down of the material above them.

The spaces right and left of the outlet-doors are made roof-shaped, as shown at V in Fig. 5.

The raw material and the fuel are led into the furnace at the top of the pit at W.

In order to be able to heat the furnace by gas, it is surrounded by a jacket a, and into the hollow space w formed the gas is introduced, coming from a generator, by means of a pipe Z, twyer-like openings b admitting the gas into the furnace A.

A bell-door may be fitted to the top of the furnace and then the furnace-gases may be let away by openings c into a collecting-cham-

nel *d*. In those cases when the furnace-gases go direct into the chimney they may be used for producing steam in a pipe *x*, which is connected to a water-tank *y*, mounted round the chimney and serving for increasing the draft of the chimney.

Into the solid spaces between the outlet-doors *F* special fireplaces *l* are arranged, Figs. 5 and 8, by means of which the furnace can be heated separately, the heating-gases produced in these auxiliary fireplaces entering through channels *m* into the gas-jackets *a*, whence they are let into the calcining-furnace through the openings *b*. These auxiliary fires are also valuable in such cases where it is not desirable to mix the fuel with the material to be treated in the calcining-furnace and where no special gas-generator is at hand.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a furnace for continuously calcining and roasting limestone, cement, gypsum, dolomite and like materials the combination with a conical shaft *A*, base *C* supporting the same, pillars *B* upholding said base, radial girders *D*, a ring-girder *H*, delivery-cone *E* supported by said girders, lanterns *L*, closing-cap *M* and a table *J* with valves *K* arranged therein below the cone *E* as described and shown.

2. In a furnace for continuously calcining and roasting limestone, cement, gypsum, dolomite and like materials the combination with a conical shaft *A*, base *C* supporting the same, pillars *B*, upholding said base, radial girders

D, and a ring-girder *H*, a delivery-cone *E*, lanterns *L*, closing-cap *M*, a table *J* with valves *K* underneath said cone, of hinged doors *R* *S*, with bars *T* and spikes *U*, connected to bars *T*, said furnace having openings *F* into which said spikes extend, the whole substantially as illustrated and described.

3. In a furnace for continuously calcining and roasting limestone, cement, gypsum, dolomite and like materials the combination with a conical shaft *A*, the base *C* supporting the same, pillars *B*, upholding the said base, radial girders *D*, ring-girder *H*, and delivery-cone *E*, supported by said girders, lanterns *L*, cap *M*, the table *J*, valves *K* therein, doors *R* *S*, bars *T*, spikes *U*, connected therewith, the fireplaces *l*, said furnace having outlet-openings therein on each side of said fireplaces, the channels *m*, gas-jacket *a* and openings *b*, substantially as described.

4. In a furnace for continuously calcining and roasting limestone, cement, gypsum, dolomite and like materials the combination with a conical shaft *A*, a base *C*, supporting the same and pillars *B* upholding said base, radial girders *D* and a ring-girder *H*, a delivery-cone *E*, lanterns *L* and a cap *M*, a table *J*, valves *K*, and doors *R* *S*, bars *T*, spikes *U*, fireplaces *l*, and a gas-jacket *a* with openings *b* in the upper work of the stack, outlet *c* and channels *d* for the furnace-gases, for the purpose set forth.

AUGUST DAUBER.

Witnesses:

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F. H. STRAUSS.