

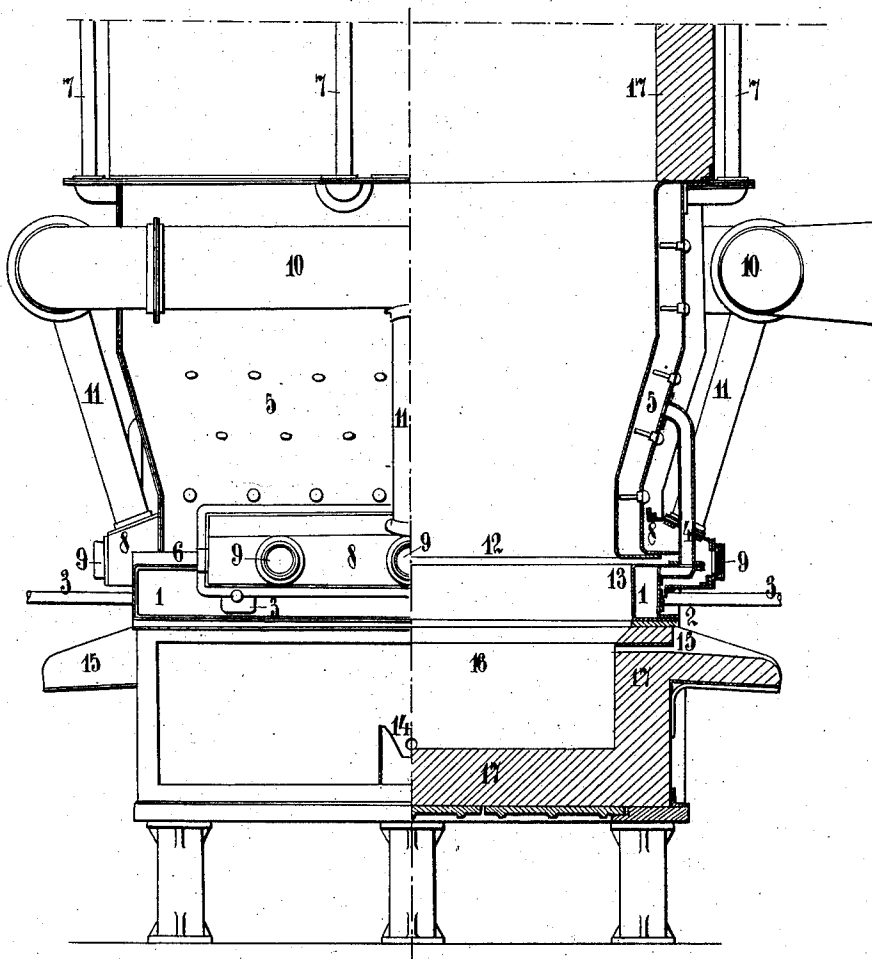
A. D. LEDUC.
MEANS FOR REPLACING TWYERS IN AIR BLAST FURNACES.
APPLICATION FILED APR. 5, 1911.

1,025,531.

Patented May 7, 1912.

4 SHEETS-SHEET 1.

Fig. 1.



WITNESSES
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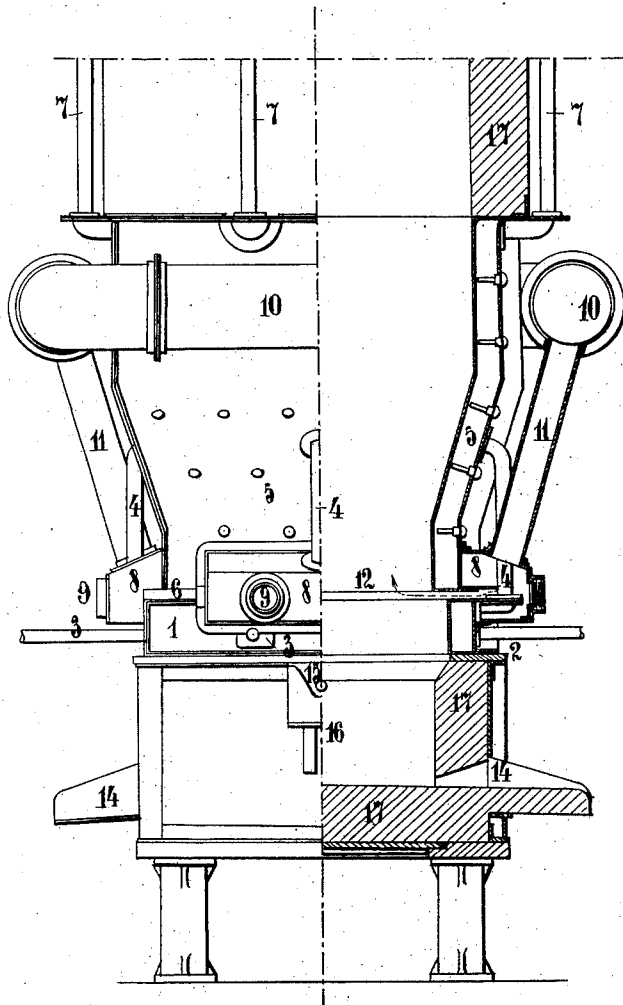
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4 SHEETS-SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 4

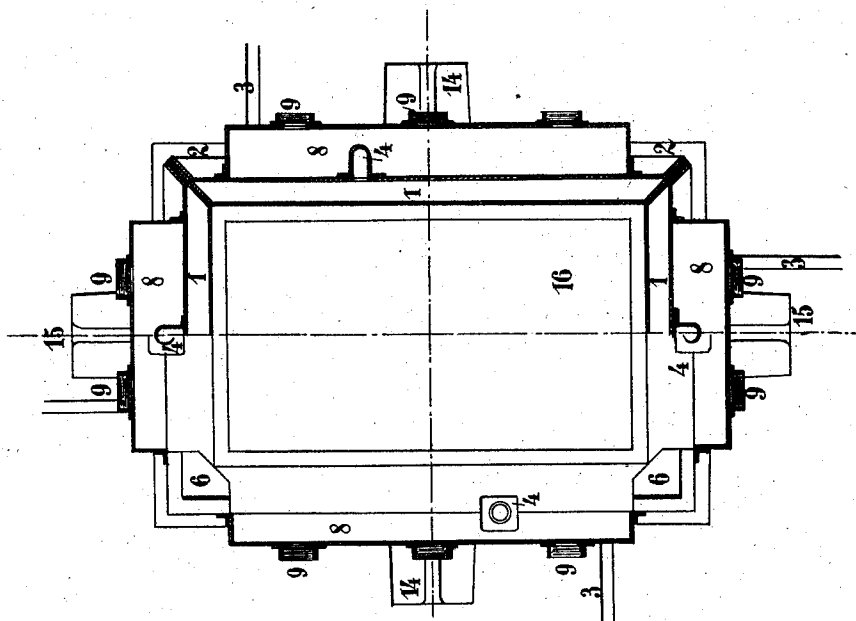
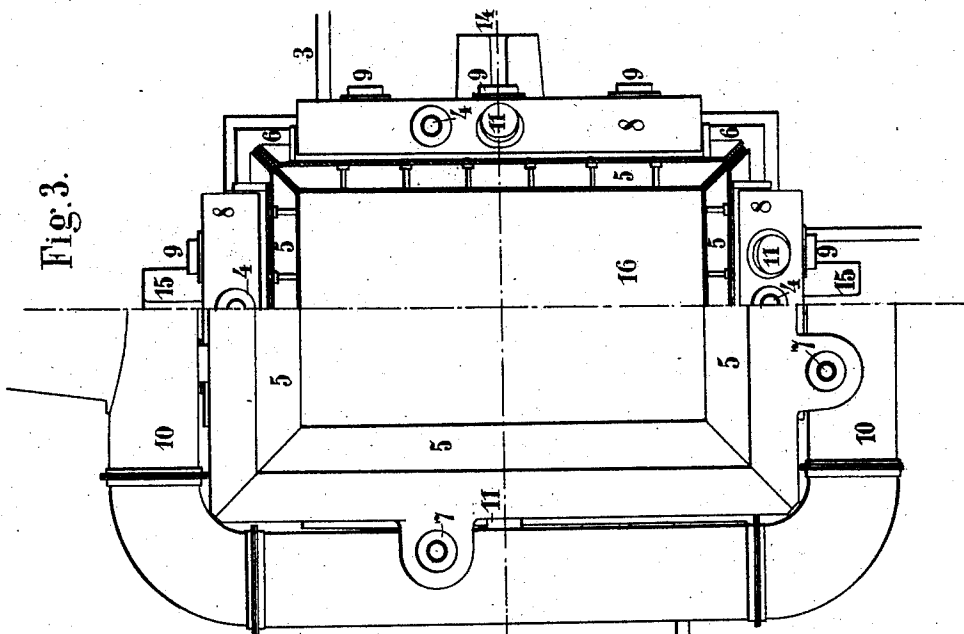


Fig. 3.



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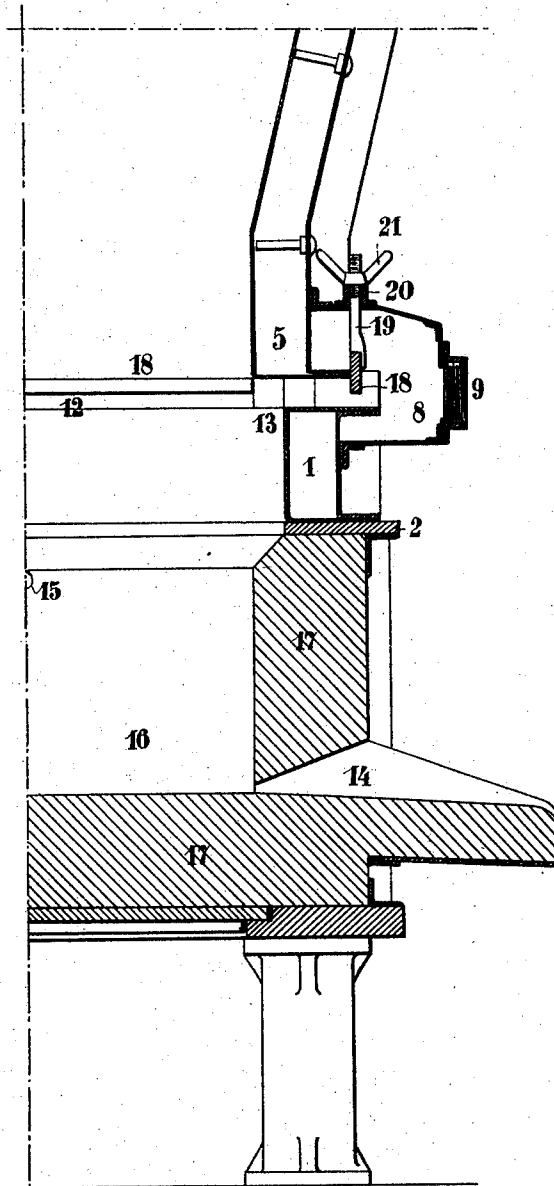
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4 SHEETS—SHEET 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

ALFRED DÉSIRÉ LEDUC, OF ROUEN, FRANCE.

MEANS FOR REPLACING TWYERS IN AIR-BLAST FURNACES.

1,025,531.

Specification of Letters Patent.

Patented May 7, 1912.

Application filed April 5, 1911. Serial No. 619,075.

To all whom it may concern:

Be it known that I, ALFRED DÉSIRÉ LEDUC, a citizen of the Republic of France, and resident of Rouen, France, have invented
5 a new and useful Means for Replacing Twyers in Air-Blast Furnaces, which is fully set forth in the following specification.

The present invention has for its object to replace the twyers, which in air-blast furnaces conduct the air to isolated points in the fusion zone, by a continuous slot extending throughout the entire periphery of the furnace at the same height as that at which the twyers are located thus distributing the
10 air uniformly and regularly to every part of the fusion zone.

In air blast furnaces the air is admitted through twyers arranged at greater or smaller distances from each other; the air
20 thus reaches the fusion zone at points which are more or less close together and the part comprised between two adjacent twyers receives less air at its middle than at its extremities.

The invention which forms the object of the present patent seeks to obviate the defects arising from blowing at certain points in line with the twyers by a blowing effected uniformly throughout the entire periphery of the furnace. This object is attained by replacing the twyers by a slot extending throughout the entire outer and inner surface of the furnace; this slot may be regarded as constituted by twyers arranged
30 immediately side by side with the intermediate walls omitted. The combustion is thus maintained by a continuous sheet of air instead of by jets of air which always impinge upon the same points. This arrangement insures a uniform supply of air at every point of the fusion zone while at the same time every part of the exterior of this zone is visible.

Contrary to what is the case in a known form of cupola furnaces in which the air is drawn through a circular slot and in which the pressure cannot exceed 40 to 50 mm. of water, the inventor surrounds the single twyer, that is to say the slot, with an air chamber from which the air is forced
50 into the fusion zone at the necessary pressure for the metallurgical treatment that is to be carried out.

A movable screen composed of one or
55 more independent parts arranged inside the

air chamber and operated from the exterior of this chamber enables the passage of the air to be reduced or cut off at any desired point in the fusion zone; by reducing the passage of the air in this manner it is possible to increase the pressure if necessary.

The sheet of air is applicable to all air blast furnaces whatever the form of these furnaces may be. This arrangement of blowing in a sheet of air produces a more rapid fusion and perfect uniformity in the descent of the charges which results in an economy of fuel. It is a known fact with twyers that when the proportion of fuel is too small, chimneys are formed above the twyers through which the gases escape rapidly and that through these chimneys the unfused materials reach the crucible while between the twyers combustion is not complete owing to lack of air. Consequently when blowing through twyers is adopted more fuel is burned than is really necessary in order to maintain above the twyers a considerable thickness of fuel and this presents the double defect of largely increasing the expenditure of fuel and diminishing the rapidity of the fusion.

An embodiment of the invention is illustrated by way of example in the accompanying drawings in which:—

Figure 1 is a front elevation partly in section. Fig. 2 is an end elevation partly in section. Fig. 3 is a plan partly in section through the upper water jacket, 5. Fig. 4 is a section on the axis of the inspection openings and through the lower water jacket 1. Fig. 5 is a semi-sectional end elevation showing the shutter 18.

Referring to the drawings in detail, there are two water jackets for each face; the water jacket 1 rests upon cast iron plates 2 and comprises a cold water inlet 3 and a communication chamber 4 discharging the water into the upper water jacket 5. The latter rests upon cast iron blocks 6 maintaining the water jackets 1 and 5 at a uniform distance apart; it has a hot water outlet at 7. The air chamber 8 containing inspection apertures 9 is secured to the water jackets 1 and 5; the air enters from the main conduit 10 through the nozzles 11 in the air chamber 8, passes between the water jackets 1 and 5 and enters the furnace in the form of a sheet of air 12.

The water jackets 1 can be arranged in

line with the water jackets 5 but it is preferable to set them back in order to prevent obstruction of the sheet of air 12 by the slag which solidifies on the inner face of the
5 water jacket.

The inspection apertures 9 enable the whole of the fusion zone to be supervised and the slot 12 to be freed by means of tongs if the passage should by chance become ob-
10 structed by solidified slag.

According to circumstances but mainly for second-fusion cupola furnaces the sheets of air can be multiplied by superposing other small jackets.

15 The thickness of the blocks 6 is variable according to the purposes for which the furnace is intended but during operation a shutter 18 in one or more parts enables the section of the slot 12 to be reduced by means
20 of the arm 19, the fixed part 20 and the nut 21.

In the application of the invention to a rectangular water jacket furnace the sheet of air has been assumed to be adapted to
25 each of the four faces but, generally speak-

ing it will only be applied to each of the two large faces or even to only one of them.

I claim:

In a blast furnace, a wall made up of upper and lower water jackets, said water
30 jackets being spaced apart to provide an elongated horizontal passageway or slit, such slit having substantially horizontal top and bottom walls, an air chamber arranged
on the outside of the water jackets and over- 35
lying said slit, a vertically disposed gate or valve arranged in said air chamber, outside of said water jackets and extending substantially the full length of the slit, and means for raising and lowering said valve 40
so as to regulate the amount of air passing through said slit.

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

ALFRED DÉSIÉ LÉDUC.

Witnesses:

PAUL NOEL,
CIRÓVE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."