

(No Model.)

2 Sheets—Sheet 1.

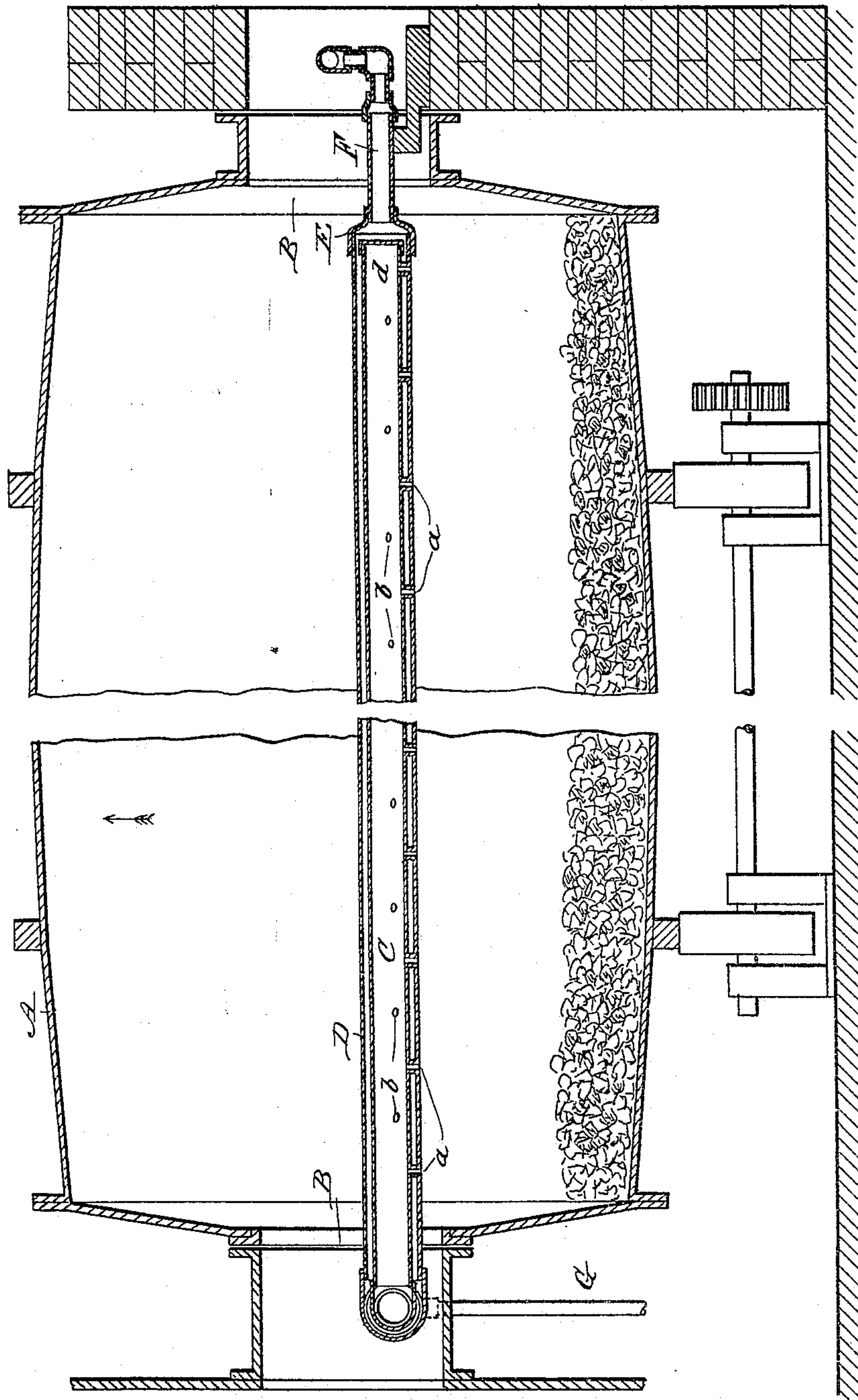
E. M. CLARK.

APPARATUS FOR OXIDIZING OR DESULPHURIZING ORE.

No. 428,830.

Patented May 27, 1890.

Fig. 1.



WITNESSES:

D. C. Reusch.
C. Sedgwick

INVENTOR:

E. M. Clark

BY

Munn & Co.

ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

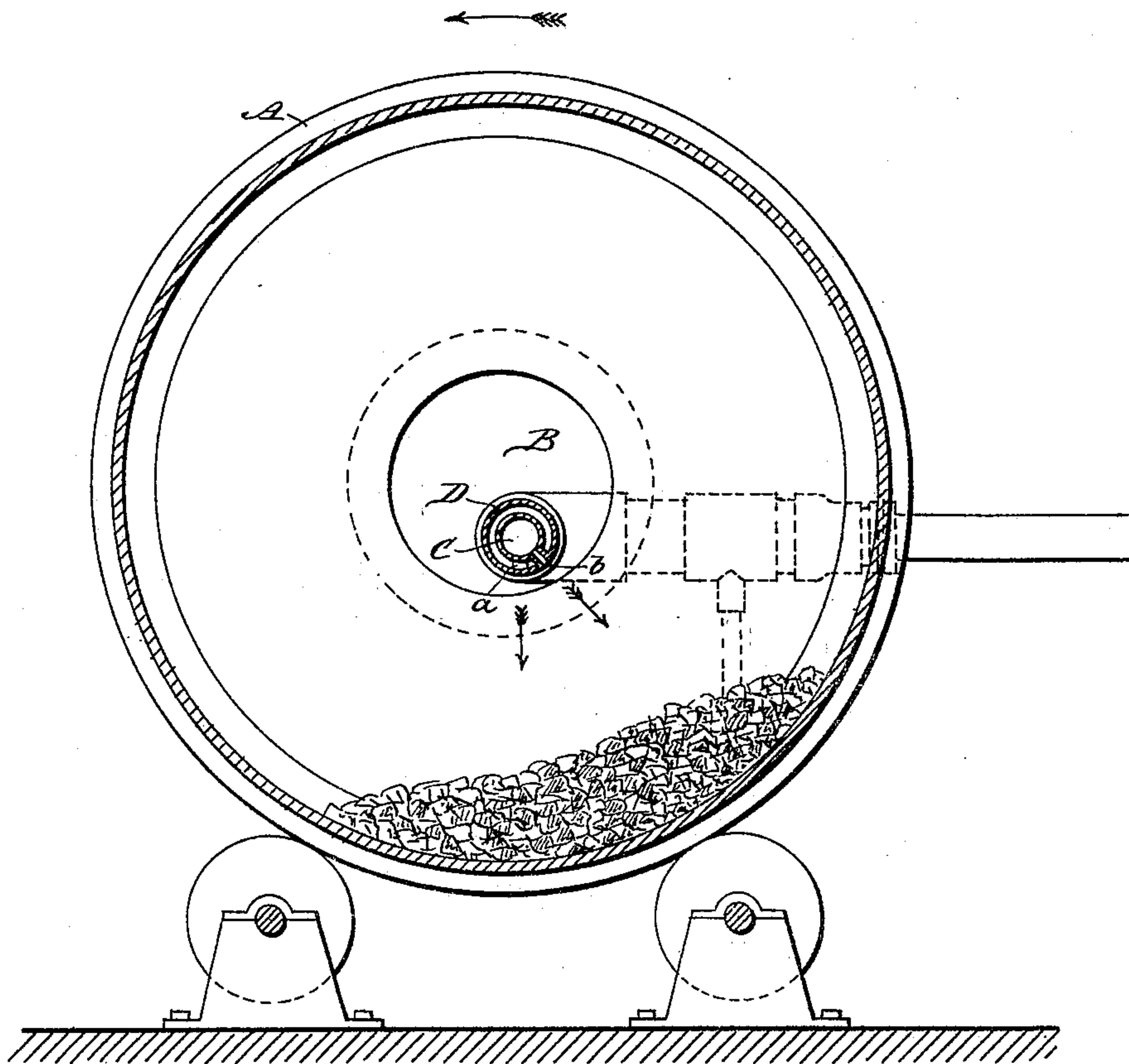
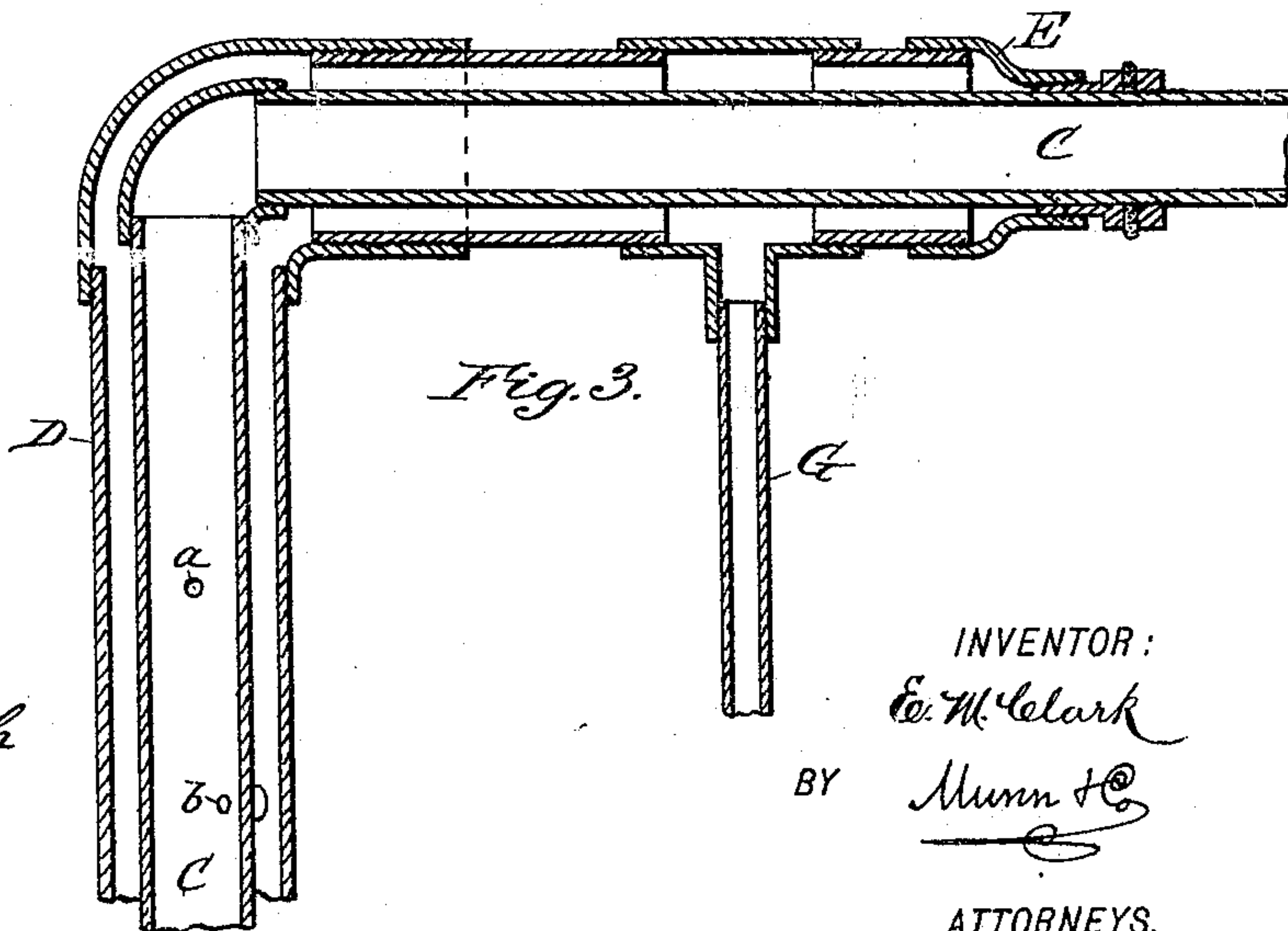


Fig. 3.



WITNESSES:

D. C. Reusch
C. Sedgwick

INVENTOR:

E. M. Clark

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UNITED STATES PATENT OFFICE.

EDWIN MARION CLARK, OF BUTTE CITY, MONTANA, ASSIGNOR TO HIMSELF, AND EDWARD W. CLARK AND LAWRENCE MULDOON, BOTH OF SAME PLACE.

APPARATUS FOR OXIDIZING OR DESULPHURIZING ORE.

SPECIFICATION forming part of Letters Patent No. 428,830, dated May 27, 1890.

Application filed October 16, 1889. Serial No. 327,182. (No model.)

To all whom it may concern:

Be it known that I, EDWIN MARION CLARK, a citizen of the United States, residing at Butte City, in the county of Silver Bow and State of Montana, have invented a new and useful Apparatus for Oxidizing or Desulphurizing Ore, of which the following is a specification.

It is well known that in the reduction of ores containing any considerable percentage of sulphur it is first necessary to desulphurize the ore. This is usually done by roasting the ore at a sufficient heat and for a sufficient time to consume or destroy the sulphur.

The object of my invention is to accomplish this result in a much shorter time, and consequently at less expense. I attain this object by forcing a large supply of air into the furnace containing the ore, thus hastening combustion and consequent desulphurization. I have shown my invention as applied to an ordinary Bruckner calcine furnace, as illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section of the furnace and attachment; Fig. 2, a cross-section of the same, and Fig. 3 a longitudinal section of a part of the air-pipe and water-jacket.

Similar letters refer to similar parts throughout the several views.

In the accompanying drawings, A is an ordinary Bruckner furnace, which sits upon pulleys or gears, and is rotated in a manner well known in the art, and which needs no detailed description, as the furnace forms no part of my invention. At the present time the only air that is admitted to the furnace is that which passes in at the openings B B at the ends, and the amount is insufficient to cause rapid oxidation.

My invention is as follows: An air-pipe C, connected at one end with an ordinary blower, extends through the entire length of the furnace, entering at one opening B and terminating at the other. As the air-pipe C would become red-hot from the heat of the furnace and subject to oxidation, it is provided with a water-jacket D. This water-jacket D covers

the air-pipe C throughout the length of the furnace. At or near the end of the furnace and at the end of the air-pipe C the water-jacket D is provided with a reducer E, which reducer at the discharge end of jacket D connects with the pipe F, through which the heated water runs off. The pipe F is connected by a nipple with a still smaller pipe, which conveys the water to any desired place of deposit. The water is conveyed to the water-jacket D by the pipe G. This pipe should connect with a tank or aqueduct which will allow the water to flow into and fill the water-jacket by its own gravity. The supply of water may be regulated by a valve in the usual manner.

The air-pipe C is provided with a series of jets *a b*, part of which point downward and part toward the side of the furnace at an angle of about forty-five degrees from the former and toward the side to which the ore tends to roll, on account of the rotation of the furnace. In an ordinary large-size Bruckner furnace I find twenty-nine jets a convenient number, fifteen of which discharge downward and fourteen toward the side of the furnace. The air-pipe C is stopped at one end by the cap *d*, and all the air blown into it is forced out through the jets *a b*.

In practice I make the water-jacket D four inches in diameter and the air-pipes C two and a half inches in diameter. The air-jets *a b*, I make three-eighths of an inch at the opening. These measurements may be varied, if necessary or desirable. I insert the air-jets *a* and *b* through the pipes D and C in any suitable manner and give them preferably a three-eighth-inch discharge-opening. The capacity of the combined air-jets should be greater than that of the air-pipe C, so that when air is forced through the pipe under great pressure it will not pass through the jets with sufficient force to scatter the ore.

I am aware that in the manufacture of steel it has long been the practice to force air through the melted metal. I therefore do not claim the introduction of forced air into a furnace broadly as my invention.

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

5 An apparatus of the character described, consisting in the revoluble furnace A, having end openings B B, a water-jacket D, extending through the furnace, a reducer E at one end of the jacket, a discharge-pipe F, connected with said reducer and extending
10 through one opening B, a water-supply pipe G at the opposite end of the jacket beyond

the opposite opening B, an air-pipe C within said jacket and having one end *d* closed at the reducer E, an air-supply pipe connected with its opposite end, and jets *a b*, projecting 15 from the pipe C through the water-jacket, substantially as set forth.

EDWIN MARION CLARK.

Witnesses:

W. R. KEITHLY,
JNO. F. COWAN.