(No Model.) 2 Sheets—Sheet 1.

J. E. SHETTLE.

ROTARY ORE ROASTER.

No. 466,882. Patented Jan. 12, 1892.

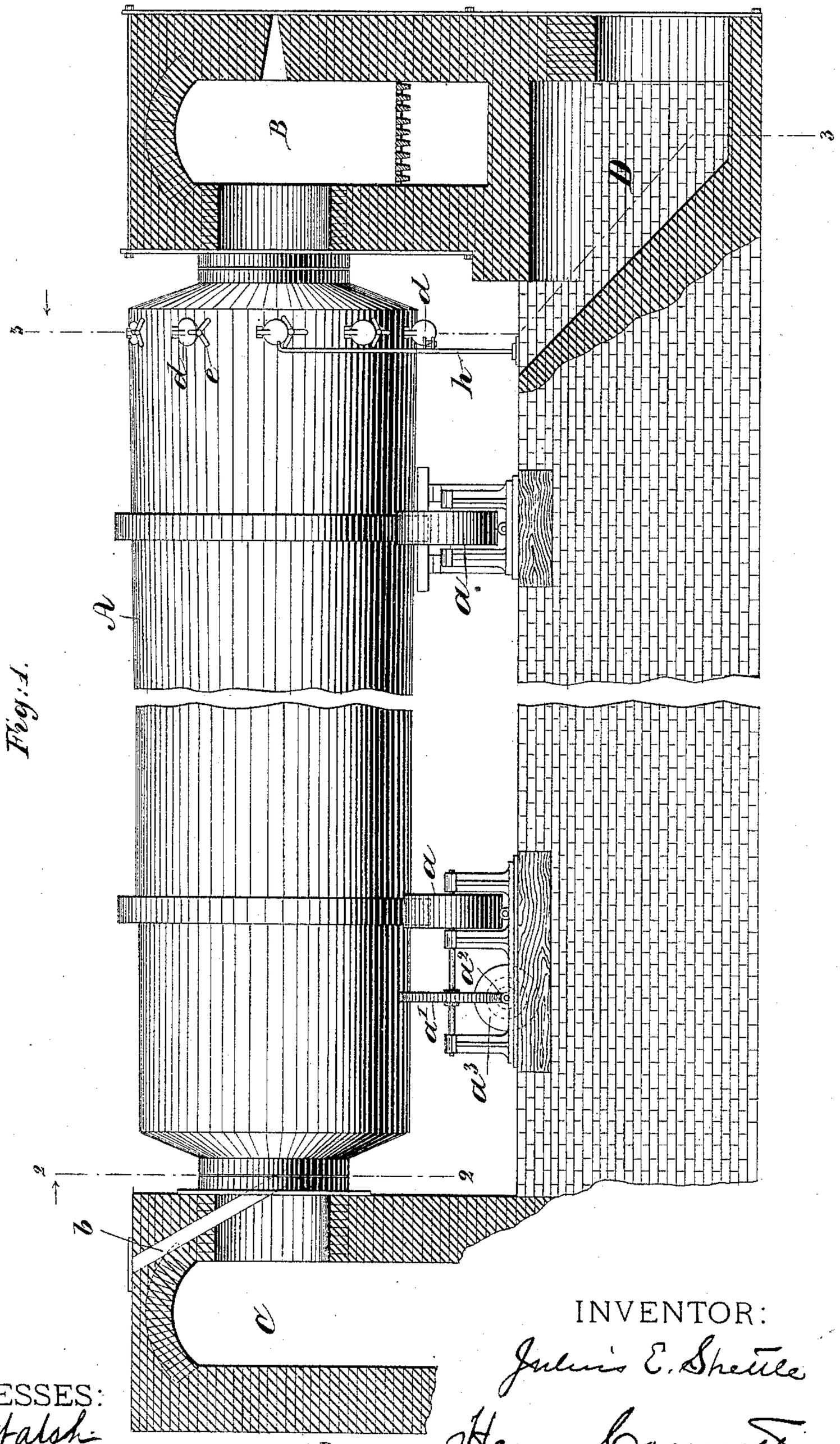

Fig. 1.

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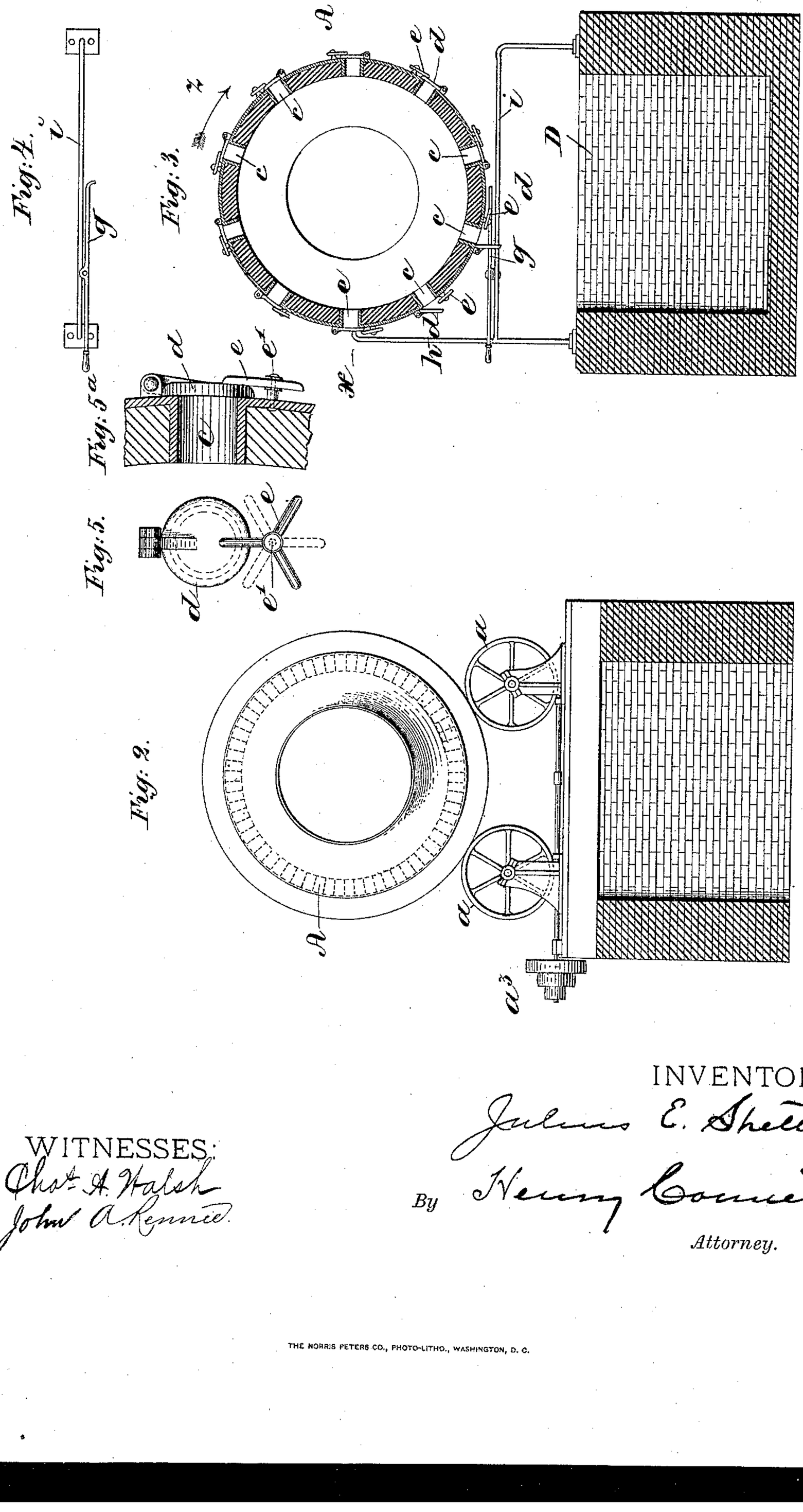

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INVENTOR:
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UNITED STATES PATENT OFFICE.

JULIUS E. SHETTLE, OF SALT LAKE CITY, UTAH TERRITORY.

ROTARY ORE-ROASTER.

SPECIFICATION forming part of Letters Patent No. 466,882, dated January 12, 1892.

Application filed June 18, 1891. Serial No. 396,712. (No model.)

To all whom it may concern:

Be it known that I, JULIUS E. SHETTLE, a citizen of the United States, residing in the city and county of Salt Lake, in the Territory of Utah, have invented certain Improvements in Rotary Ore-Roasters, of which the following is a specification.

My invention relates to the class of rotary-cylinder roasters for ores, wherein the ore enters at one end, passes through, and is discharged at the opposite end, whereat the furnace-gases enter.

The object of my invention is to provide the cylinder with outlets for the ore at the discharging end and with means for automatically opening and closing the outlets.

The invention will be fully described hereinafter, and its novel features carefully defined in the claim.

In the accompanying drawings, which serve to illustrate my invention, Figure 1 is a side elevation of the roaster, some of the brickwork being represented in section. Fig. 2 is an end view of the ore-receiving end of the rotary cylinder, the view being taken from the plane indicated by the dotted line 2 2 in Fig. 1. Fig. 3 is a vertical transverse section taken in the plane indicated by the dotted line 3 3 in Fig. 1. Fig. 4 is a detached plan view of the automatic opener. Fig. 5 is a face view, on a large scale, of one of the gravity-doors and its rotary latch; and Fig. 5ª is a side or edge view of the same.

A is what I will call the "cylinder," although I prefer to make it slightly tapered or conical, as shown. This cylinder is of metal, lined with fire-brick or other suitable refractory material. It rests on rollers *a a*, and is rotated slowly when in use through the medium of a worm-wheel a', a worm a^2, and a pulley a^3 on the worm-shaft. This is the common mode of rotating such cylinders.

B is the furnace from which the gases pass into and through the cylinder A, passing thence into the flue or uptake C at the ore-receiving end of the cylinder. The cylinder A may be of any desired length. Usually it will be from twenty to forty feet long and have a diameter of from four to seven feet. As before stated, it will be slightly tapered by preference, being largest at the furnace end or ore-discharging end. In Fig. 1 it is represented as broken away at the middle part to illustrate that it may vary in length.

So far as above described the construction is the same as or similar to that commonly employed.

The ore is delivered into the cylinder A through an inclined spout *b*, and when it reaches the discharging end of the furnace it is discharged by gravity through the discharge-outlets *c*, (seen in Fig. 3,) whence it falls into the banking-pit D. The outlets *c*, of which the number and size may be variable, are in the wall of the cylinder near the end where the furnace-gases enter, and these outlets will be by preference equally distributed about the circumference of the cylinder, as best seen in Fig. 3. Each outlet *c* will have a hinged cover *d* arranged exteriorly to the cylinder and adapted to open by gravity when unlatched or freed. Figs. 5 and 5ª represent the cover *d* and its rotary latch *e* on a comparatively large scale. The latch *e* has a boss which turns on a stud e' and three equally-spaced arms which radiate from said boss. When the latch *e* is turned so as to stand as represented in full lines in Fig. 5, one of its arms takes over the cover *d* and holds it closed; but when said latch is turned as represented in dotted lines in said figure—that is, so that neither of the arms overlap the cover *d*—the said door is then free to open by gravity when brought to the under side of the cylinder by the rotation of the latter.

The latch *e* is actuated automatically by means that I will now describe.

Suppose the cylinder A to be rotating in the direction of the arrow *z* in Fig. 3. When an outlet *c* reaches a point directly under the axis of the cylinder, (the cover *d* being meanwhile held closed by the latch *e*,) the latch *e* is rotated through about one-sixth of a revolution by the contact of one of its arms with an unlocking-bar *g*. (Seen detached in Fig. 4.) This movement of the latch frees the cover *d*, which falls and allows some portion of the ore to pass out and down into the pit D. Fig. 3 shows the open door just after it has passed the latch-bar. As the cylinder continues to rotate the door *d* gradually closes again, and when it is about on a level with the axis of the cylinder it will have again closed. At this point (at *x* in Fig. 3) an arm

on the latch encounters a hooked locking-bar *h*, which acts to rotate the latch through about one-sixth of a revolution or sufficient to again cause an arm of the latch to take over the cover *d* and hold it against dropping open. The bars *g* and *h* are stationary and act by detaining an arm of the latch, whereby the rotation of the cylinder effects a partial rotation of the latch about its stud. These bars *g* and *h* may be fixed in position; but I prefer to pivot the unlocking-bar *g* on a cross-frame *i* or on some other fixed part, so that its operative end may be turned out of the path of the latch, in which case the covers will not be released and the ore will not be discharged for the time.

By this mechanism I provide for the automatic discharge of the ore in a continuous manner, thus avoiding the overheating of the ore collected at the hottest part of the cylinder. With a cylinder provided with my continuous automatic discharge the heating of the ore is substantially uniform. Thus I avoid the loss of metal by volatilization and through the carrying off of the dust with the draft.

Having thus described my invention, I claim—

In a rotary ore-roaster, the combination, with the rotatively-mounted cylinder A, provided with a series of discharging-outlets for the ore, with pivoted covers *d* for said outlets, adapted to open by gravity, and with rotary latches *e* for holding said covers closed, of the unlocking-bar *g* and locking-bar *h*, adapted to actuate the latches, as described, when the cylinder rotates, as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JULIUS E. SHETTLE.

Witnesses:

WILLIAM ROBERTS,

WILLIAM E. JACOBS.