

No. 621,715.

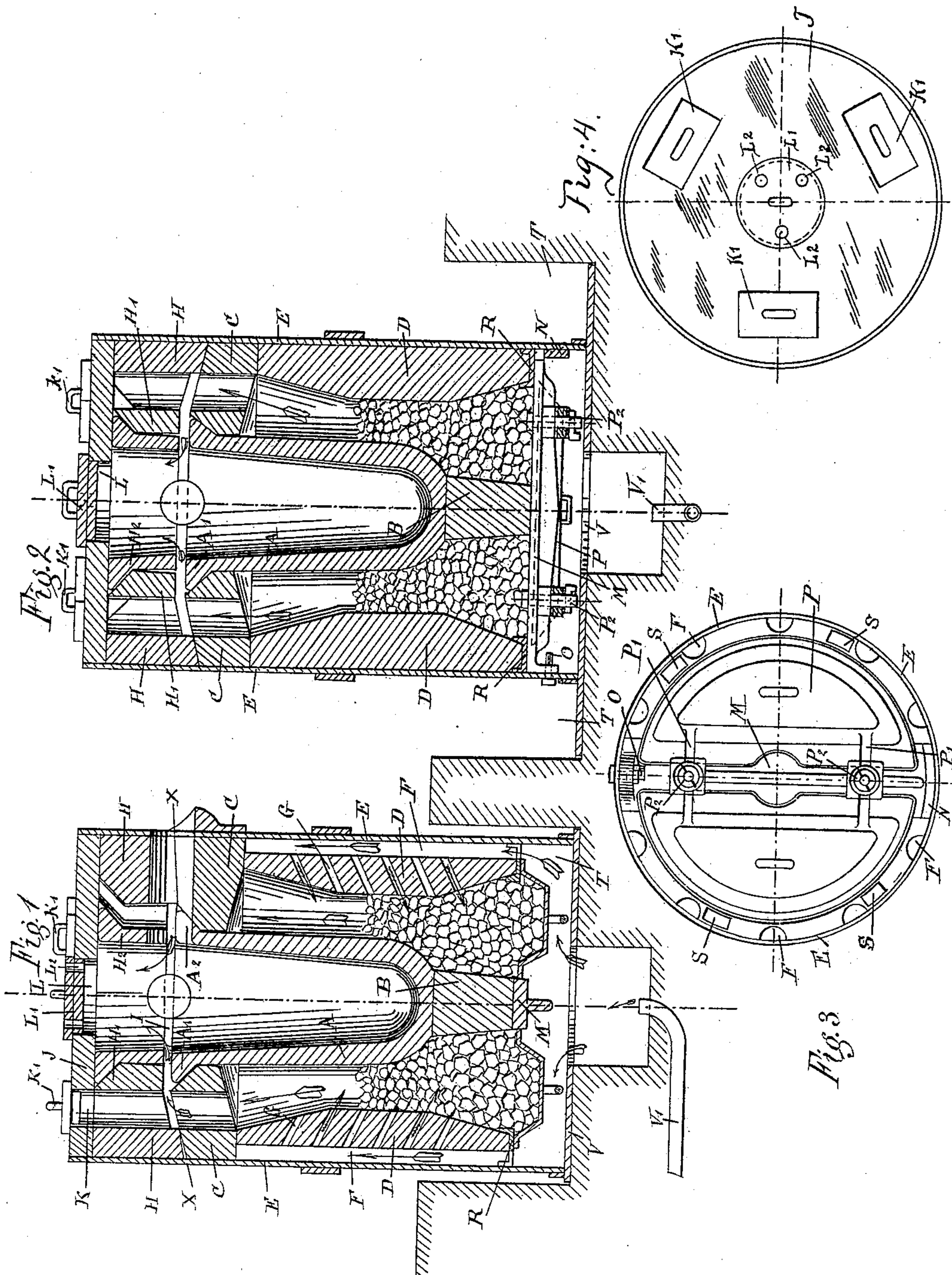
Patented Mar. 21, 1899.

L. ROUSSEAU.
FURNACE FOR SMELTING METALS.

(Application filed Feb. 19, 1898.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:

Jas. A. Richmond.

A. L. Donohoe.

Inventor:
L. Rousseau.

by G. Dittmer
Attorney.

No. 621,715.

Patented Mar. 21, 1899.

L. ROUSSEAU.
FURNACE FOR SMELTING METALS.

(Application filed Feb. 19, 1898.)

(No Model.)

3. Sheets—Sheet 2.

Fig. 7

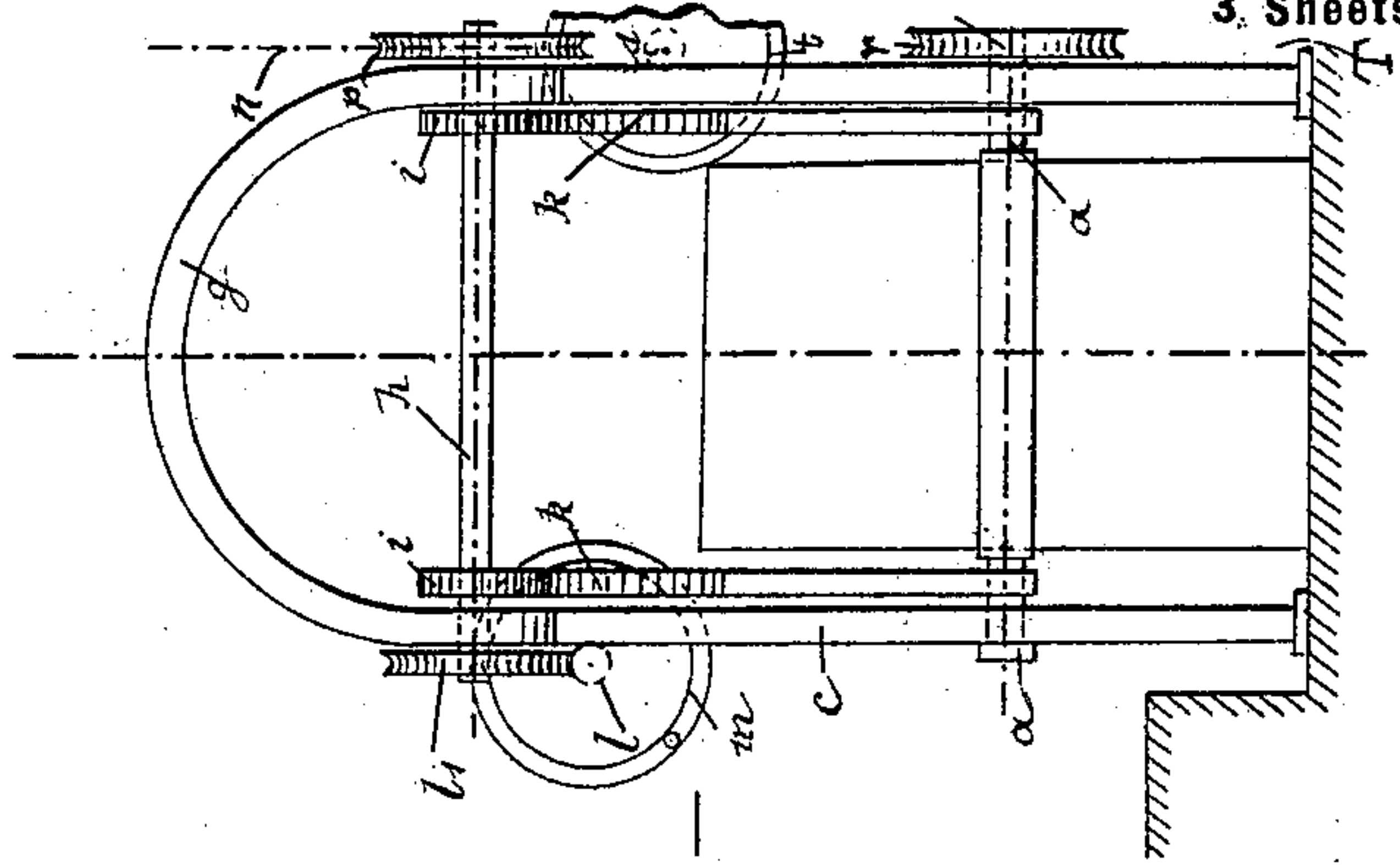


Fig. 5

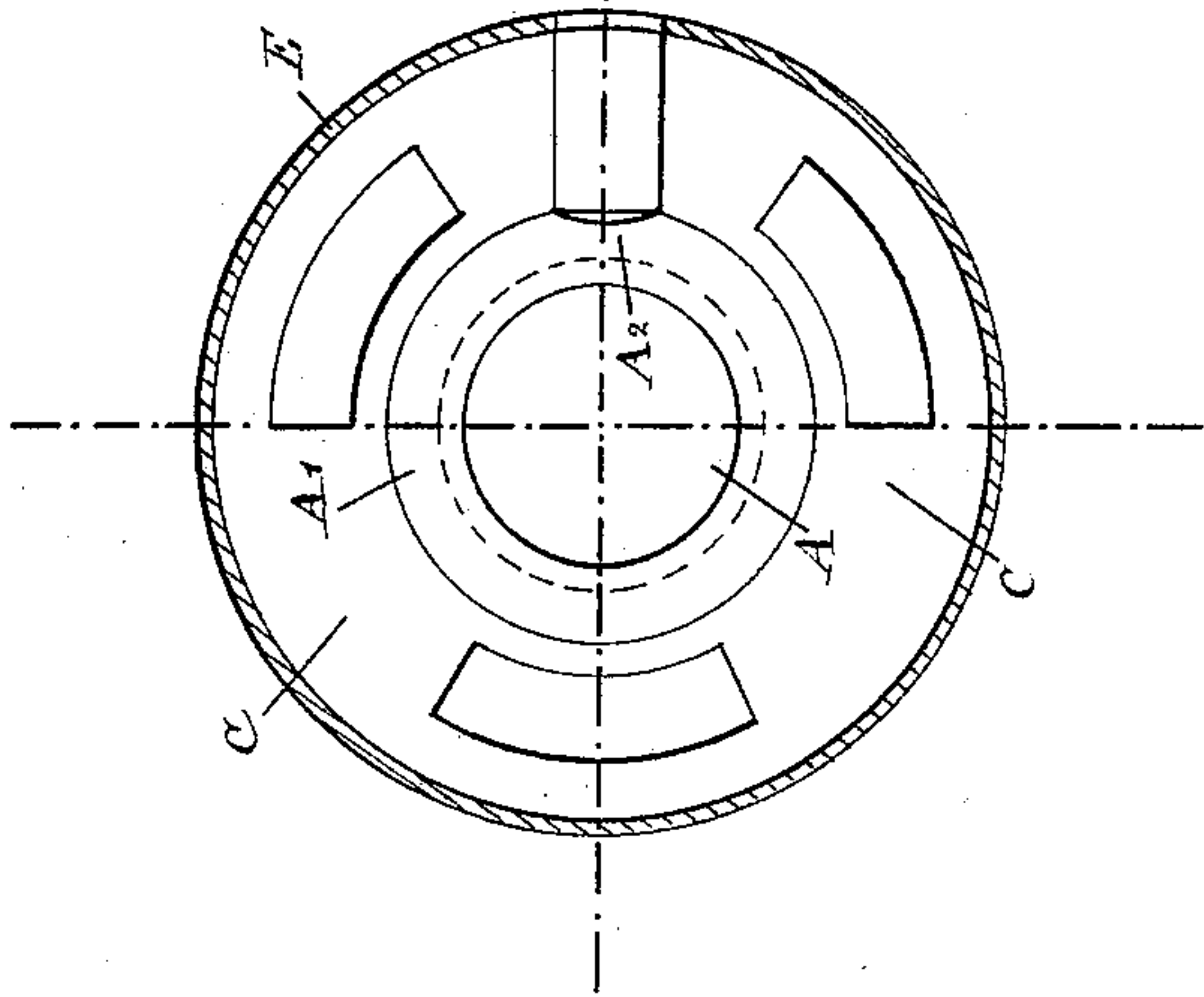
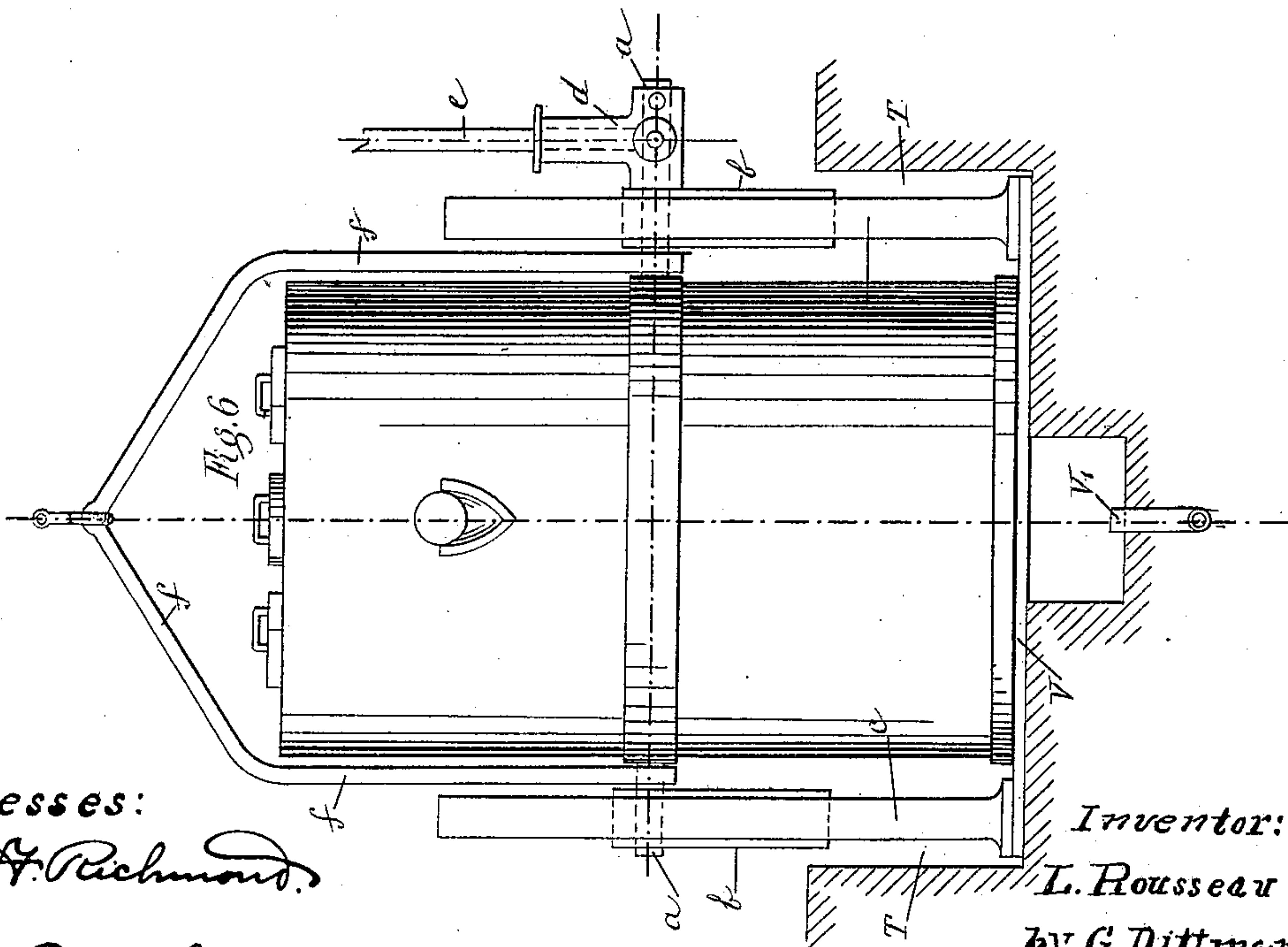


Fig. 6



Witnesses:

Jas. H. Richmond.

A. L. Donohoe

Inventor:

L. Rousseau

by G. Dittmar

Attorney.

No. 621,715.

Patented Mar. 21, 1899.

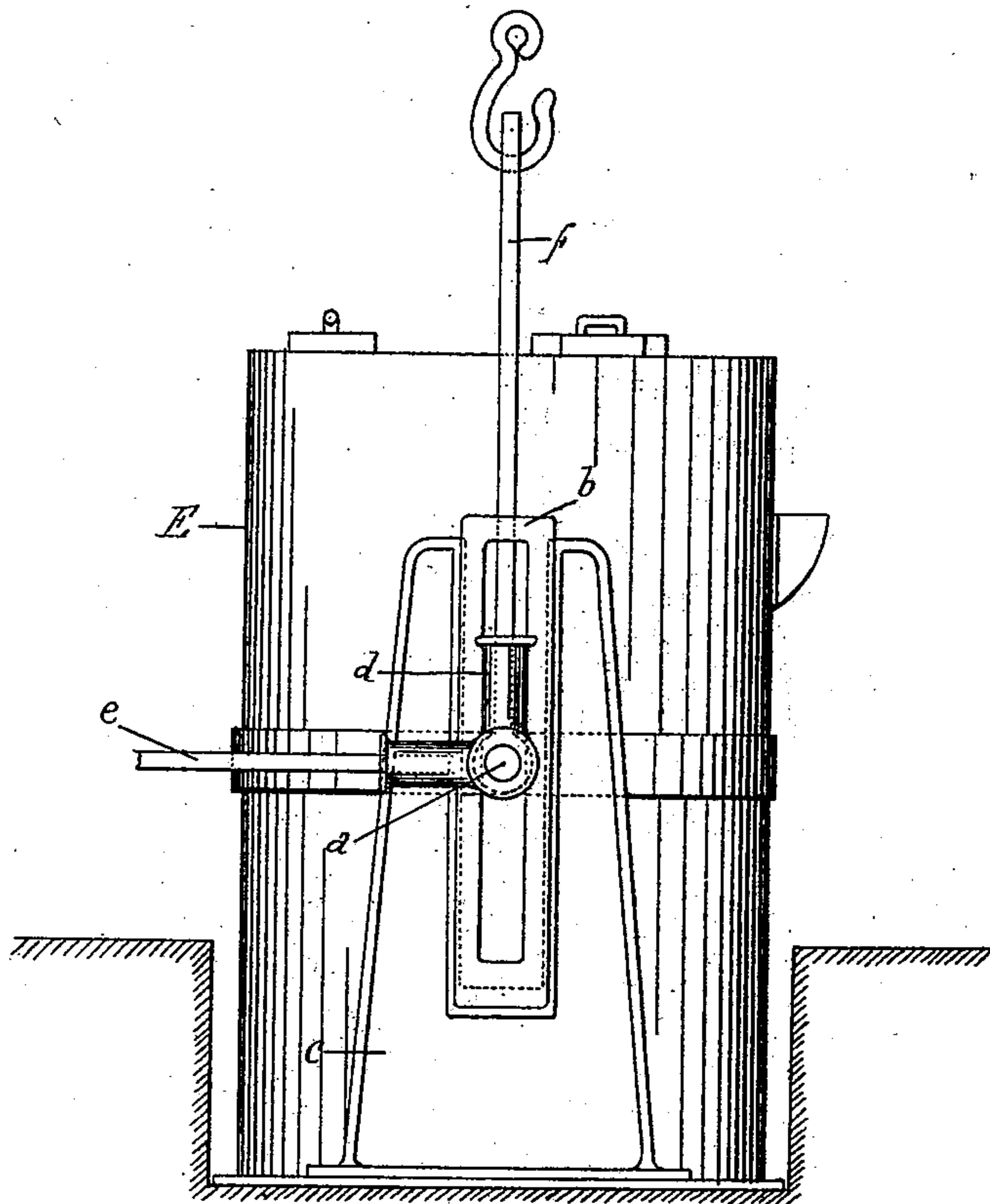
L. ROUSSEAU.
FURNACE FOR SMELTING METALS.

(Application filed Feb. 19, 1898.)

(No Model.)

3 Sheets—Sheet 3.

Fig. 8



Witnesses
A. L. Donohoe
Jas. H. Richmond

Inventor.
L. Rousseau
By *G. Dittmar*
his Attorney.

UNITED STATES PATENT OFFICE.

LOUIS ROUSSEAU, OF PARIS, FRANCE.

FURNACE FOR SMELTING METALS.

SPECIFICATION forming part of Letters Patent No. 621,715, dated March 21, 1899.

Application filed February 19, 1898. Serial No. 670,965. (No model.)

To all whom it may concern:

Be it known that I, LOUIS ROUSSEAU, a citizen of the French Republic, residing at Paris, France, have invented certain new and useful
5 Improvements in Furnaces for Smelting Metals; and I do hereby declare that the following is a full, clear, and exact description of the same.

The present invention has reference to an
10 improved furnace for smelting metals in which the air required for the combustion instead of being introduced directly underneath the hearth is sent through lateral apertures formed in the casing of the hearth
15 and inclined in such manner as to cause the air to arrive in opposite direction to the gases produced by the combustion in order that the latter should be as complete as possible and that a better utilization of the heat produced should be obtained.

The annexed drawings represent an example of construction of the furnace.

Figure 1 is a sectional elevation, and Fig. 2 a sectional side view, of the furnace. Fig. 3
25 is a plan view of the furnace seen from below. Fig. 4 is a similar view seen from above. Fig. 5 is a sectional view through a line X X, Fig. 1; and Fig. 6 is a side view of the furnace, showing all its different working parts.
30 Fig. 7 is a similar view, but showing a modification of the mechanism for manipulating the furnace. Fig. 8 is a side elevation of the tipping apparatus shown in Fig. 6.

The furnace-crucible A, made of any suitable material, as plumbago, is supported at
35 its lower part by a crucible-stand B and is provided at its upper part with a collar A', bearing a crown C. The collar A' is provided with a notch A² for the running off of the
40 metal. The form of the crucible can vary. Instead of having a plain external face it can, for instance, be made thinner and be provided with reinforcing-ribs. The crucible-stand B could also be dispensed with. The
45 crucible is surrounded by fillings C D, made of fireproof material, and between said fillings and crucible there is a sufficiently large space left to receive the fuel required for the smelting, the fillings being protected outwardly by a sheet-iron casing E. A certain
50 number of flues F are formed vertically in the filling D, said flues being connected with

the interior of the hearth by means of channels G.

The upper part of the furnace is constituted
55 by a circular crown H, supporting two movable crowns H' and H², between the base of which and the upper part of the crucible is left a circular space I for the escape of the furnace-gases. The inner diameter of the
60 crown H is such that by removing the crowns H' and H² the crucible can be removed when requiring to be changed. The furnace is closed at its upper part by means of a fireproof plate J, which is provided with aper-
65 tures K to permit the introduction of the fuel, the said apertures being closed with covers K'. This plate J is also provided with a central aperture L, closed by a cover L', which is provided with perforations L² for the escape
70 of combustion-gases.

The bottom of the furnace is formed with a cross-beam M, which rests at one of its ends on a plate N, fixed to the casing E, and supported at its other end by a pin with key O,
75 said pin being passed through the casing E and located in a boss of the cross-beam M. The latter supports a split plate P, made of two pieces fixed together by means of ribs P'. To facilitate the removing of such plate, the
80 same is fixed on the cross-beam M by means of two bolts and keys P². The filling D rests at its lower part on a U-shaped iron beam fixed on corner-plates S, Fig. 3, fixed to the casing E.
85

The irons R and S are provided with holes corresponding to the flues F for the passage of air. The fitting up of the parts which form the bottom of the furnace is arranged in such way that the air can only enter the hearth by
90 passing through the flues F.

The furnace is placed in a pit T and is supported on a metal crown V, which is cut out in the center with a view to allow the air coming from the blast-machine through the pipe
95 V' to pass.

The operation of the furnace is as follows: The metal to be melted being placed in the crucible-pot and the furnace being fired, the air coming from the blast-machine is forced
100 through the flues F and through the aperture G and arrives into the hearth in the direction shown by the arrows. The current of the air blowing in a direction opposite to that of the

gases, it mixes itself closely with them and accelerates and completes their combustion. In coming at the upper part of the hearth the gases pass through the annular aperture I to
 5 escape through the opening L. In this way they pass to the upper part of the crucible and heat the metal to be melted by radiation.

To simplify the operation of the furnace at the time of the running off, two trunnions *a*,
 10 mounted in sliding blocks *b*, which slide between two standards *c*, located on each side of the furnace, are fixed to the casing E, Fig. 6. On one of the trunnions *a* is fixed a sleeve
 15 *d*, which is provided with two sockets in which a lever *e* can be introduced to cause the furnace to oscillate on the trunnions *a*. These parts are clearly shown in Fig. 8. A
 20 fork *f* is mounted on the trunnions *a* and permits the furnace to be lifted by means of a tackle or any other lifting device. This operating device can be replaced by that shown, Fig. 7. The two standards *c* are connected
 25 together by an arch-beam *g*, supporting a shaft *h*, on which are mounted two gearing wheels *i*, engaging with chains *k*, attached to the trunnions *a*. The shaft *h* is driven by means of a worm engaging with a worm-wheel
 30 *l* mounted on it. The motion is transmitted to the worm *l* by a fly-wheel *m*, provided with crank. To facilitate the lifting of the furnace, the weight thereof is equilibrated by means of a balancing-weight attached to a
 35 chain *n* and acting upon the shaft *h* through the medium of a wheel *p*. To cause the furnace to oscillate on the trunnions *a*, a worm-wheel *r* is fixed on one of the latter, and said
 40 wheel is adapted to engage with a worm *d*, driven by a fly-wheel, when the furnace is lifted. This device permits the whole furnace to be operated by means of the two fly-wheels *m* and *p* only.

I claim—

1. In a smelting-furnace as described, the combination with a hearth, of suitable means
 for supplying fuel to said hearth from above, 45
 a crucible-pot arranged and suitably mounted in said hearth, a casing surrounding and adapted to carry said hearth or combustion-chamber, a fire bridge or crown supporting
 said crucible at its upper end, channels con- 50
 necting said hearth and crucible-pot, means associated with the crucible-pot for the escape of gases of combustion and suitable means for its oscillation, a pit contiguous to
 and below said combustion-chamber, vertical 55
 flues formed between said casing and the wall of the combustion-chamber and communicating with said pit, said wall being provided with downwardly-inclined channels adapted
 to admit air to the combustion-chamber, 60
 whereby an intimate mixture occurs and the combustion of said gases is completed, and suitable means for supplying air under forced
 draft to said pit, substantially as described.

2. The combination with a smelting-fur- 65
 nace, a crucible-pot arranged therein, and means for supplying air laterally to the combustion-chamber, of a pair of trunnions secured one on each side of said furnace and
 mounted in sliding blocks, standards *c* adapted 70
 to guide said blocks, a sleeve fixed to one of said trunnions, said sleeve being provided with sockets; and a lever adapted to be engaged in said sockets, whereby the furnace
 may be oscillated on said trunnions, substan- 75
 tially as specified.

In witness whereof I have hereunto set my hand in presence of two witnesses.

LOUIS ROUSSEAU.

Witnesses:

LUILE GRÜNNER,

EDOUARD TERWELS.