(No Model.) 3 Sheets—Sheet 1.

H. H. EAMES.

APPARATUS FOR CHLORIDIZING GOLD, SILVER, AND OTHER ORES.

No. 332,705. Patented Dec. 22, 1885.

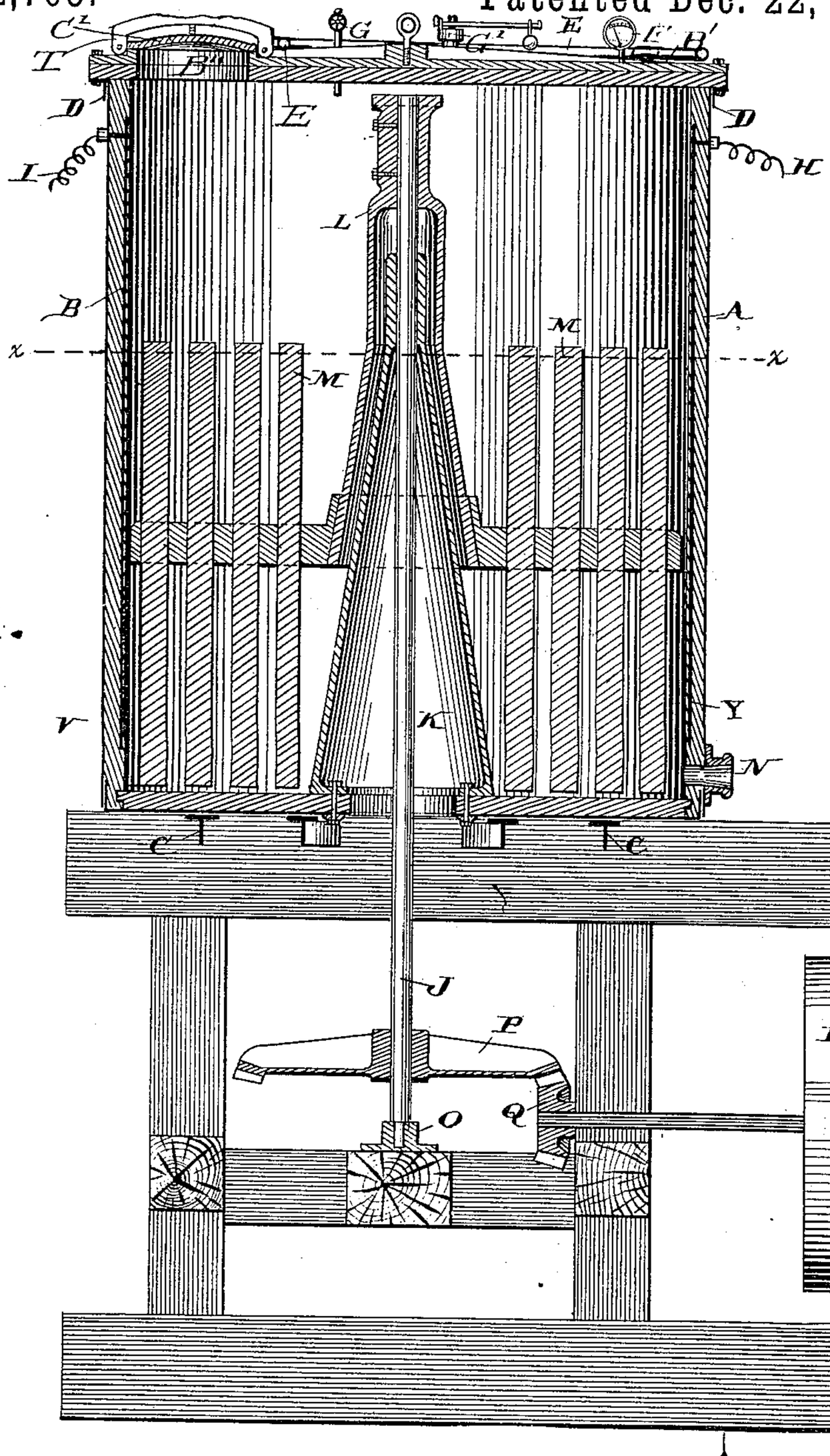

Fig. 1.

Witnesses.

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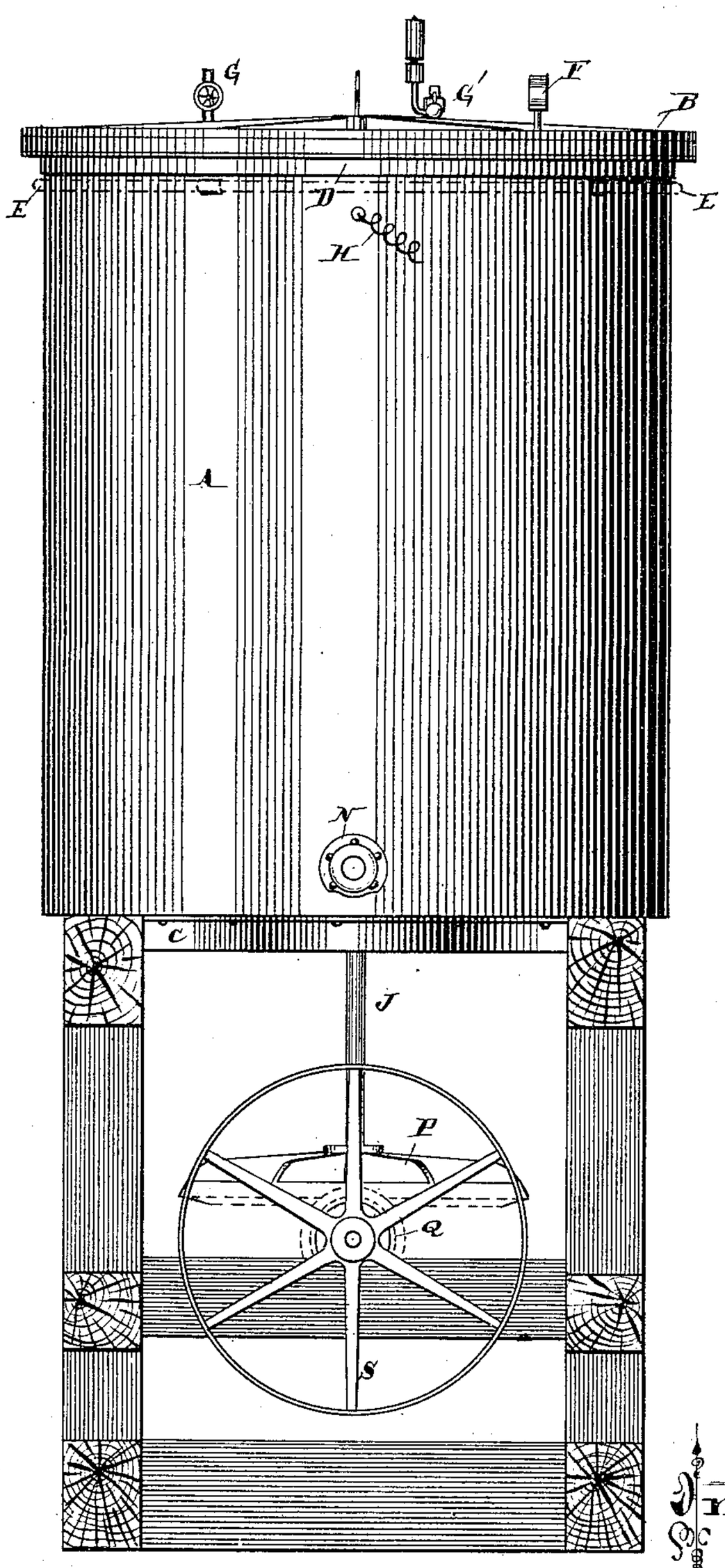
Fig. 2.



Witnesses.

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(No Model.) 3 Sheets—Sheet 3.

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APPARATUS FOR CHLORIDIZING GOLD, SILVER, AND OTHER ORES.

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Fig. 3.

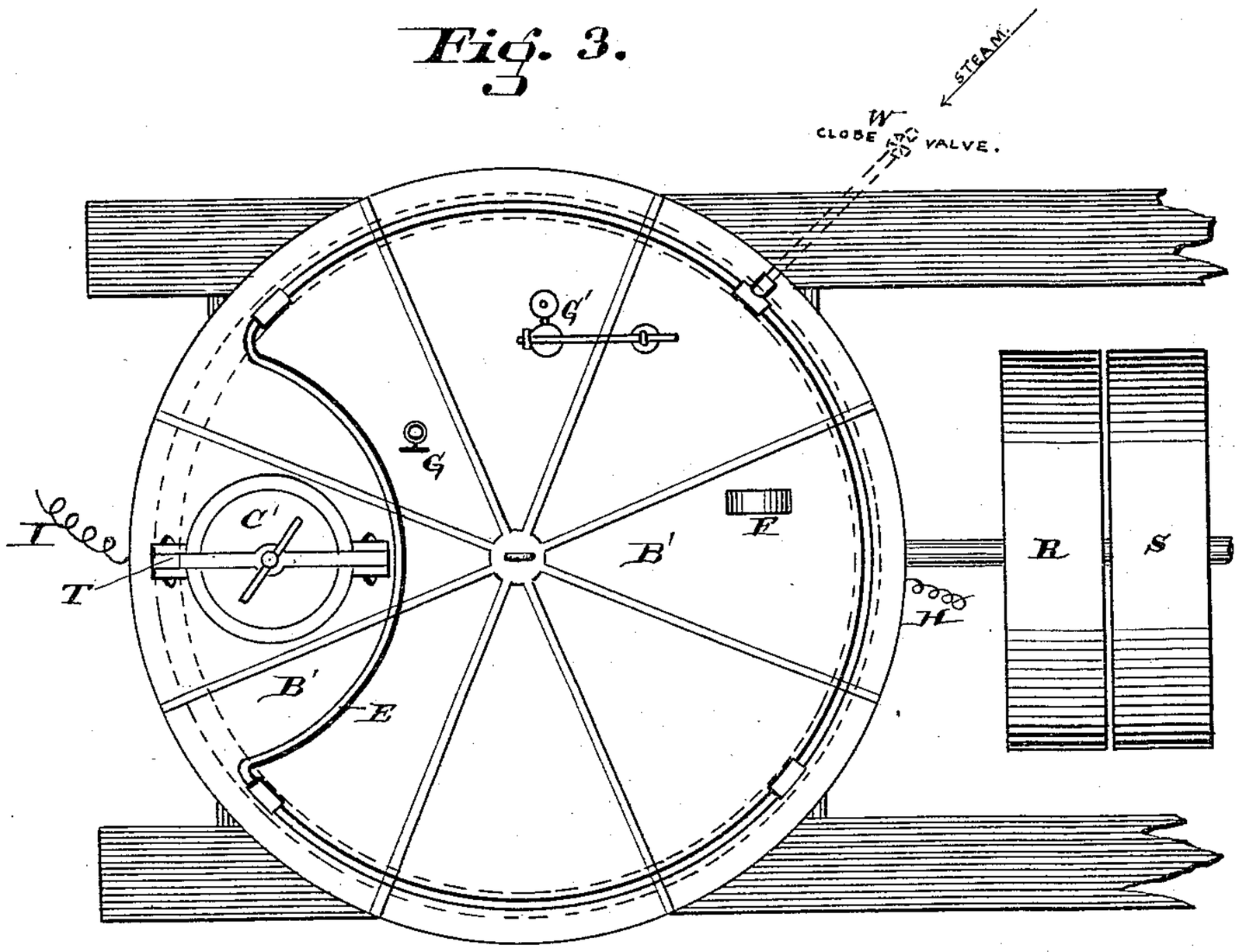
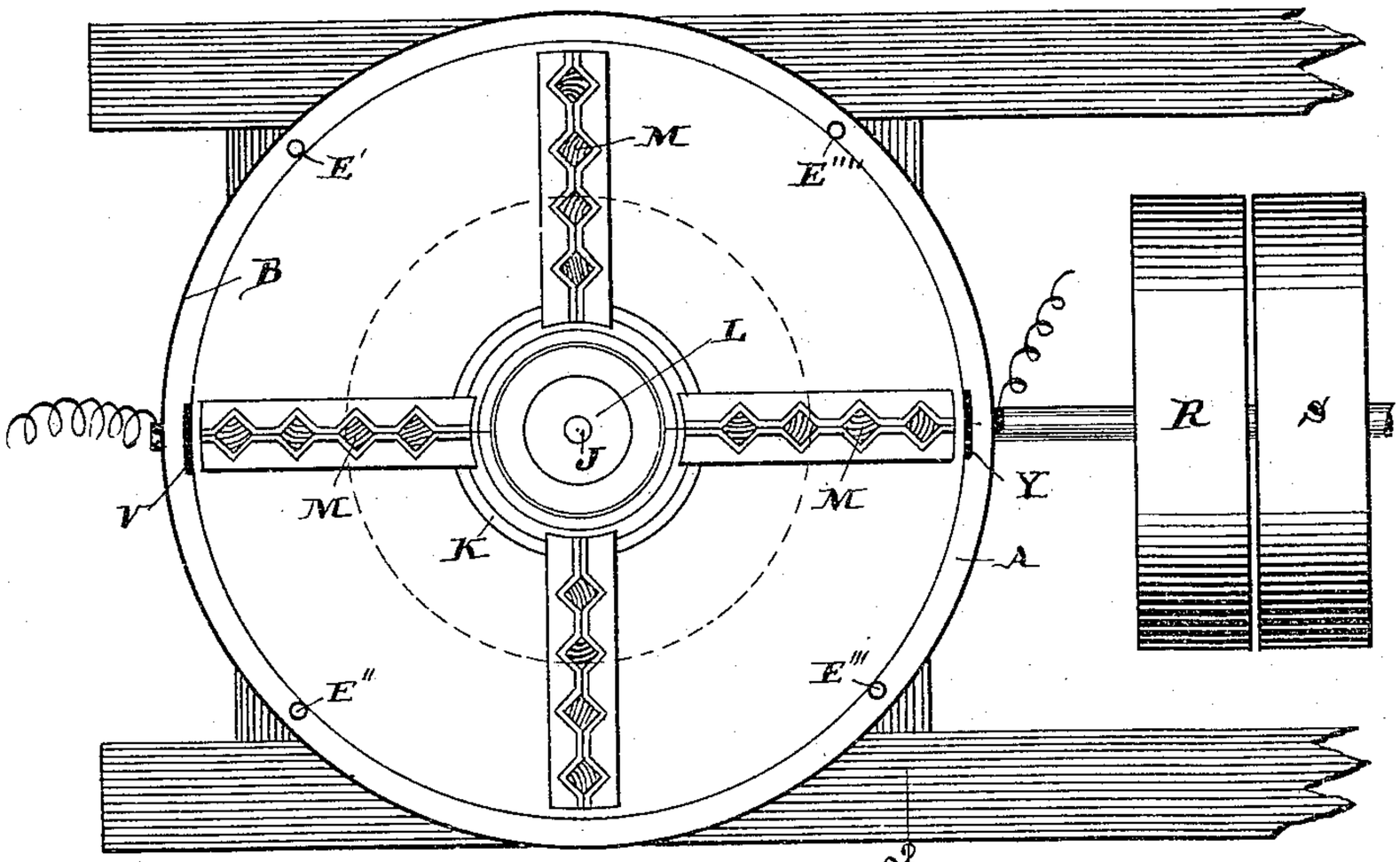


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

HENRY H. EAMES, OF PHILADELPHIA, PENNSYLVANIA.

APPARATUS FOR CHLORIDIZING GOLD, SILVER, AND OTHER ORES.

SPECIFICATION forming part of Letters Patent No. 332,705, dated December 22, 1885.

Application filed April 21, 1885. Serial No. 162,946. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. EAMES, of the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Chloridizing Gold, Silver, and other Ores by and with the Aid of Pressure and Electricity, (for which process an application for Letters Patent of the United States was filed November 20, 1884,) of which the following is a specification.

This invention pertains to that class of machines used in chloridizing ores, having for its object a more thorough and speedy action on the material to be chloridized than those heretofore used, and a more economical use of the chemicals employed in chloridizing metallic ores.

This invention consists of an iron vessel, cylindrical in shape, lined with wood, having a cast-iron cover, adjusted so as to be steam and vapor tight. It is also arranged with a set of stirrers, to which motion is communicated by crown and pinion wheels. It is also fitted with pipes, by means of which steam can be forced through the contents and held there under pressure. It is also furnished with two electrodes, by which electricity can be passed through the ore and chemicals operated upon while the pressure is applied. The electric current is best obtained from a dynamo-machine of ordinary construction used in the deposition of metals.

Reference being made to the accompanying drawings, in these drawings is shown the apparatus by which this object can be obtained, in which Figure 1 is a sectional elevation, in detail, of the apparatus. Fig. 2 is an elevation of the same. Fig. 3 is a plan, and Fig. 4 is a horizontal section on line *x x*.

A is a cylindrical tank of any desired size; but I prefer one about four (4) feet in diameter and five (5) feet deep, made of boiler-plate iron, and provided throughout with a lining, B, of wood. The bottom should be strengthened with the T-irons C, and the top B′ being of cast-iron, and provided with a wooden lining upon its under side and adapted to be strongly and tightly secured to the tank, which may be effected by bolts passing through angle-iron D, previously secured to the upper outer periphery of the tank. The cover B′ is provided with a charging-hole, B″, having a lid, C′, adapted to be held in place and tightly secured by a cotter-bar, T.

E E is a steam-leader for conveying the steam to the pipes E′ E″ E‴ E⁗, and may be placed as shown in Figs. 1 and 3, or encircle the tank below the angle-iron D, and supported there as shown in Fig. 2, connection being made through the tank A with the pipes E′ E″ E‴ E⁗.

F is a steam-gage, and G a valve-controlled steam-escape pipe.

G′ is a safety-valve, with whistle-indicator.

N is an outlet-gate, through which the contents of the tank may be discharged.

V and Y are copper plates or poles secured to the inside of the tank, and reaching from the top to the botto m thereof, which, by means of the wires H and I, are adapted to be connected with a dynamo-electric machine.

K is a hollow cast-iron truncated cone, bolted on the inside or otherwise tightly secured to the center of the bottom of the tank, the upper end or contracted throat of which forms a bearing for the vertical shaft J, said shaft being suitably and sufficiently supported upon a step or block, O, said shaft carrying at its upper extremity and within said tank a depending hollow cone, L, covering the upper part of cone K, and fitting closely to, but free to revolve around, the same. The cone L is, by means of set-screws, rigidly secured to the vertical shaft J, said cone forming a seal when the material is charged into the tank, and at its lower extremity terminating in arms adapted to hold vertical slats or stirrers M, which are caused to revolve by power applied to the shaft J through gearing P Q, governed and operated by the fixed and loose pulleys R S.

The cast-iron parts within the tank A should be coated with any suitable substance or material adapted to protect them from the action of the acids used in the process of chloridizing.

In operating this machine I proceed as follows: Sufficient water, with chloride of sodium, sulphuric acid, or sulphate of iron or sulphate of copper, is first charged into the tank A. Then the pulverized ore to be chloridized is introduced through the charging-hole B″, the machine having previously been set in motion. When the whole charge is in, the menstruum should have such consistency that the stirrers

M can pass easily through the mass. The charging-lid C′ is then secured, steam turned on through the pipes E′ E″ E‴ E⁗, and connection made with the dynamo by the wires H I. When the steam-pressure has reached twenty or twenty-five pounds, the safety-valve will allow it to pass into the whistle-indicator G′, when the supply of steam is to be cut off at the steam-supply valve W, and any extra pressure relieved by the escape-valve G, and when sufficient time has elapsed to chloridize the ore the outlet-gate N is opened and the contents discharged into an ordinary amalgamating-pan, when it is subjected to the action of quicksilver, as is usual; or it may be discharged into a vessel for lixiviation by any of the known solvents.

Having now described my invention, what I desire to secure by Letters Patent is—

1. The combination of the wood-lined tank A, with stirrers M, electrodes V Y, cover B′, steam-supply pipe E, with injector steam-pipes E′ E″ E‴ E⁗, safety-valve G′, with indicator-whistle, steam-gage F, and escape-valve G, as and for the purpose specified.

2. The combination of the cylindrical tank A, with wood lining B, and the iron cover or top lined with wood on the inside and fitted with steam-gage F, steam-escape pipe G, safety-valve and whistle-indicator G′, and charging-opening B″ and lid C′, steam-pipes E′ E″ E‴ E⁗, connected with steam-supply pipe E, the copper electrodes V and Y, to which the wires H and I are attached, the discharge-gate N, the truncated hollow cone K, the depending hollow cone L, with horizontal arms attached to the base thereof, the stirrers M, the shaft J, step O, wheels P and Q, pulleys R S, and the screws fastening the hollow cone L to the shaft J near the top thereof, substantially as and for the purpose specified.

HENRY H. EAMES.

Witnesses:
L. J. MATOS,
A. B. SHEARER.