

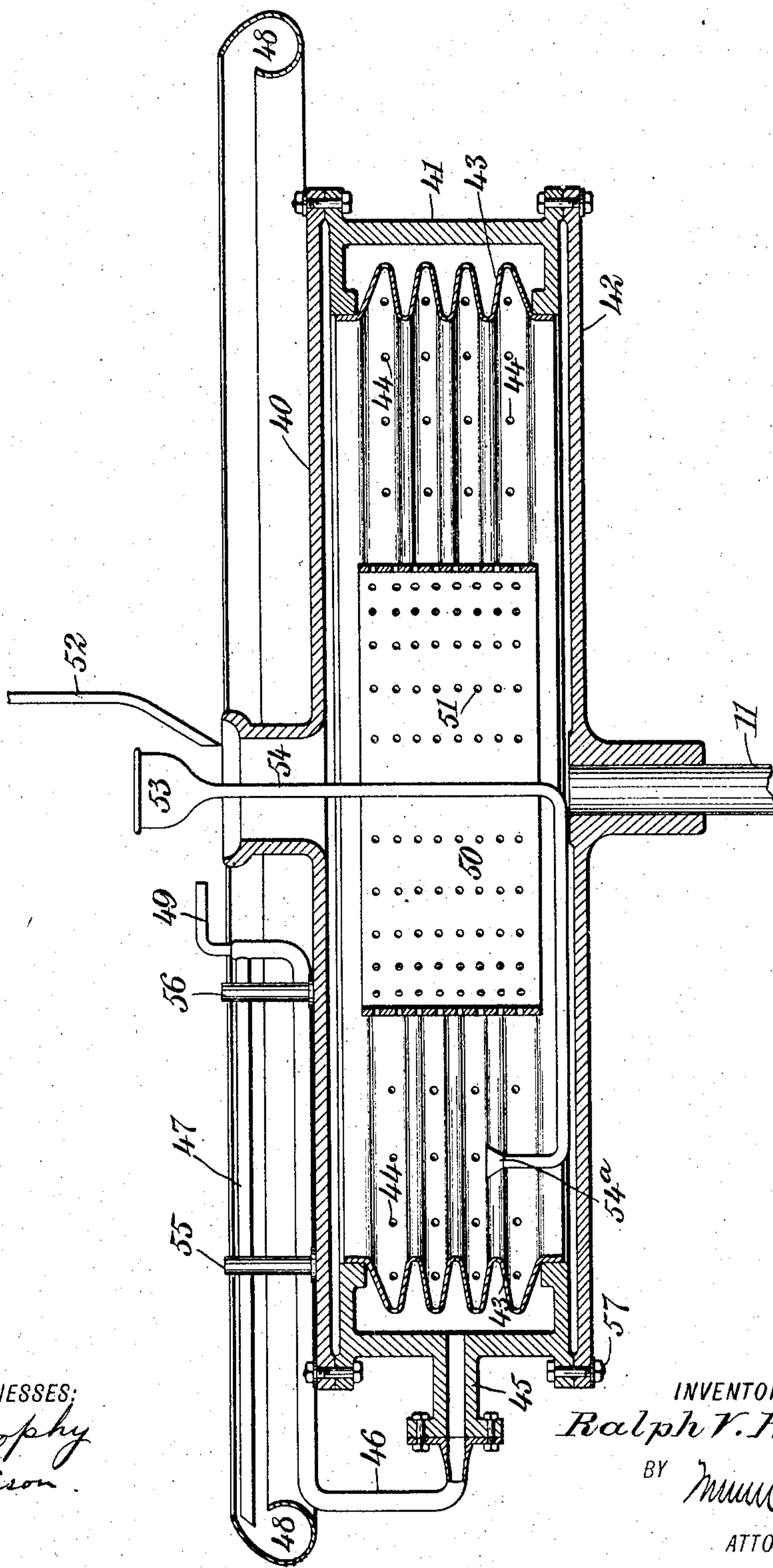
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R. V. HEUSER.

CENTRIFUGAL APPARATUS FOR ELECTROLYTIC PURPOSES.

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WITNESSES:

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CENTRIFUGAL APPARATUS FOR ELECTROLYTIC PURPOSES.

SPECIFICATION forming part of Letters Patent No. 790,055, dated May 16, 1905.

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To all whom it may concern:

Be it known that I, RALPH V. HEUSER, a citizen of Switzerland, and a resident of Erie, in the county of Erie and State of Pennsylvania, have invented a new and Improved Centrifugal Apparatus for Electrolytic Purposes, of which the following is a full, clear, and exact description.

My invention relates to electrolysis, and admits of general use, but is of peculiar value in relation to breaking up certain compounds by the joint action of the electric current and of centrifugal force.

My invention further relates to certain improvements in the electrolytic apparatus.

I do not limit myself to any particular apparatus or mechanism whereby the objects desired may be accomplished. There are, however, certain particular forms of mechanism suitable for carrying out the process, and these forms I prefer to use, as is hereinafter described and claimed.

Reference is to be had to the accompanying drawing, forming a part of this specification, in which similar characters of reference indicate corresponding parts, the figure being a vertical section through one form of my apparatus used more particularly for forming persulfate of iron.

The apparatus is partly electrolytic and partly centrifugal.

In the apparatus shown the upper lid 40, the lower head 42, and the body portion are connected together into a sort of revoluble drum 41, which constitutes the centrifugal separator. The drum is rotated by means of a revoluble shaft 11, provided with a collector 12. The anode is shown at 43 and is made, preferably, of lead. It is provided with small holes 44, through which a liquor can pass when subjected to centrifugal action. The separator is provided with a nozzle 45, to which is connected a pipe 46, having a discharge-nozzle 47, adapted to discharge into the trough 48. An air-pipe 49 supplies air to the discharge-nozzle 47, thus preventing this pipe and the pipe 46 from acting as a siphon. The cathode is shown at 50 and has, preferably, the form of a cylinder provided with holes 51. Both the anode and the cathode are mov-

able with the separator. A pipe 52 is used for supplying the separator with the liquid to be operated upon. A funnel 53, provided with a pipe 54, terminating in a nozzle 54^a, is also used for supplying liquids to the separator. Supports 55 56 are used for holding the pipe 46 so as to prevent displacement thereof while the apparatus is in action.

The drum 41 is preferably made of tiling material. The drum 43 may be formed of separate sections soldered together or otherwise united. The drum may be properly braced against the action of centrifugal force. These details, however, are immaterial, as I do not limit myself to any special construction.

The operation which is used particularly for manufacturing persulfate of iron is as follows: Sulfuric acid (H_2SO_4) is supplied through the pipe 52 into the separator, while an aqueous solution of ferrous sulfate ($FeSO_4$) is supplied through the funnel 53 and pipe 54. These liquids do not admix, because of their different densities, taken in connection with the action of the centrifugal force. The current now being applied causes the liberation of SO_4 in its nascent state at the anode 43 and forms persulfate of iron $Fe_2(SO_4)_3$. This substance has a comparatively high specific gravity, and consequently any centrifugal force tends to force the same outwardly, it thus passing through the holes 44 and finding its way through the nozzle 45, tube 46, and discharge-pipe 47, from whence it passes into the trough 48. As the sulfuric acid (H_2SO_4) is comparatively light, it is nearer the center of the apparatus than the other liquids, and thus assumes a favorable position with regard to the character of the electrodes and the direction of the current. In the course of time the anode becomes coated with peroxid of lead, (PbO_2), and this latter improves the action.

In the form of the apparatus above described the process is continuous and is conducted as cheaply as practicable, the waste of the electrodes is reduced to a minimum, and the current required is practically all used in breaking up the compounds. The centrifugal action is somewhat analogous to that of a cream-separator.

My apparatus by comparison with others more or less analogous thereto presents the following advantages, to wit: first, comparatively great output per unit of weight of apparatus employed and large percentage of the product as compared with the quantity of brine employed; second, greater current density at the cathode; third, the use of mercury is not required; fourth, the process is continuous and capable of being carried out without stopping the apparatus from running; fifth, a considerable amount of labor is saved; sixth, the apparatus can be given comparatively large proportions and yet be under complete control of the operator; seventh, the anodes possess great durability; eighth, no colloidal member or diaphragm is required.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—
1. In an apparatus of the character described, the combination of a revoluble vessel, means for causing said vessel to revolve, an anode mounted within said vessel and having the form of a perforated drum, and a cathode mounted within said revoluble vessel.

2. In an apparatus of the character described, the combination of a revoluble vessel, an anode of substantially annular form mounted therein, a cathode mounted within said revoluble vessel and encircled by said anode, said cathode being provided with perforations, and means for causing said vessel to revolve.

3. In an apparatus of the character described, the combination of a revoluble vessel, an anode mounted therein and provided with perforations through which a liquid may pass when actuated by centrifugal force, a cathode mounted within said revoluble vessel and likewise provided with perforations through which a liquid may pass, means for supplying said liquid to said revoluble vessel, and mechanism for causing said vessel to revolve.

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

RALPH V. HEUSER.

Witnesses:

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