NOTE.—*The application for a Patent has become void.*
This print shows the Specification as it became open to public inspection.

PATENT SPECIFICATION

Convention Date (Germany): Nov. 28, 1924. **243,670**

Application Date (in United Kingdom): June 12, 1925. *No. 15,280/25,*

Complete not Accepted.

COMPLETE SPECIFICATION.

A Process for Converting Mercury into another Element.

We, SIEMENS & HALSKE AKTIENGESELLSCHAFT, of Berlin-Siemensstadt, Germany, a German company, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

According to the invention, mercury is converted into other elements by subjecting it to electric shocks—for example, to electric spark discharges. Bombardment by cathode rays or especially canal rays and similar actions also come into consideration. Apparently, such electric shocks after the electric charges of the constituents of the atom and thus bring about the conversion into other elements—notably into gold.

An example of the carrying out of the process according to the invention is diagrammatically represented by Figure 1. The vessel 1 is filled up to the level A with mercury and up to the level B with a liquid dielectric—for example, paraffin oil. A capillary tube 2 dips into the paraffin oil and its lower end does not reach quite to the surface A of the mercury. It is fed with mercury through a tube 3. This mercury flows down the tube 2, collects below the liquid level A and passes by way of a tube 4 into the collecting vessel 6, into which air is blown through a tube 7. The air passes through the tube 3 and carries the mercury with it. The mercury in the vessel 1 is thus renewed in a continuous cycle. In order to be able to renew the dielectric and above all to keep it cool there is provided the outflow tube 8 through which the dielectric passes into a reservoir 9 from which it is returned to the vessel 1 by a current of air entering at 10. Before passing into the vessel 1 the dielectric passes through a tube 11 that is arranged within the cooling vessel 12. An electrode 13 dips into the tube 2 and a second electrode 14 is immersed in the mercury in the lower portion of the vessel 1. The vessel 6 is also connected by a rubber tube 16 with a vessel 15. By raising and lowering this vessel the liquid lever A can be regulated. This liquid level is so regulated that the potential applied to the electrodes 13 and 14 is not sufficient to break down the resistance of the layer of dielectric between the lower end of the tube 2 and the surface of the mercury. As soon, however, as a drop of mercury emerges from the lower end of the tube 2 and thus diminishes the thickness of the dielectric the spark breaks through. The mercury that has emerged from the tube 2 thereupon becomes finely divided and sinks in the dielectric into the lower portion of the vessel 1. Further drops of mercury that emerge from the tube 2 maintain the passage of the spark discharges. If it be desired gradually to replace the quantity of mercury circulating between the vessels 1 and 6 by fresh mercury, mercury is removed from the vessel 15 and a corresponding quantity is fed into the funnel-shaped enlargement at the upper end of the capillary tube 2. In order to convert portions of the mercury into gold by means of the spark discharged a potential of 100 to 150,000 volts is sufficient. If this potential is obtained by means of a transformer 17 it may be advisable to connect the adjustable capacity 18 into circuit since it appears that the electric oscillations produced on spark discharge

are not without influence on the conversion process.

A second example is represented by Figure 2. The vessel 1 is filled up to the level A with mercury and up to the level B with the liquid dielectric. Two electrodes 21 and 22 form a spark-gap within the dielectric. An inlet tube 23 is so arranged that mercury drops which pass through this opening fall through the spark-gap. The voltage is so adjusted that sparks pass between the electrodes only when just one drop of mercury is between the electrodes. The mercury is kept in circulation by a current of air as in the case of Figure 1. The dielectric flows through the cooling vessel 12 in consequence of the convection that results naturally from its being warmed.

Figure 3 shows a further example. In this case also the vessel 1 is filled up to A with mercury and up to B with a liquid dielectric. The mercury is passed into the vessel through two tubes 32 and 33. The ends of both of these tubes are opposite to each other in the dielectric and are at just such a distance from each other that a spark discharge only takes place when mercury issues from the tube openings. The potential is applied at 34 and 35.

A further example is diagrammatically represented by Figure 4, in cross section and by Figure 5 in longitudinal section. The vessel 41 is filled with mercury. Through a wide slot 42 in the bottom of the vessel there is forced into the mercury a liquid dielectric which is fed through a tube 43. The dielectric leaves the vessel through a pipe 44 on its upper end. The pressure by which the dielectric is caused to pass through the mercury should be sufficient to form a coherent dielectric layer by means of which the whole of the mercury is divided into two quantities of liquid which are insulated from each other and between which the electric sparks pass through the dielectric. The potential is applied by the electrodes 45 and 46. The mercury in the vessel 41 can be renewed through inlet and output pipes which are not shown in the diagrammatic figures.

Dielectrics in the solid state may also be employed. In any case care should be taken that the spark discharges do not gradually destroy the dielectric and in this way cause a short circuit. An apparatus which is useful for this purpose is represented by way of example in Figure 6. The mercury is placed in the vessel 51. This vessel is divided by a porous electrically insulating plate 52. The left end of this plate protrudes into a vessel 53 which is filled with a liquid dielectric with which the plate saturates itself. The spark discharges pass through the plate 52. Any hollow space in which a coherent thread of mercury or arc might be formed is immediately refilled by the liquid dielectric from the vessel 53. The plate 52 on its right-hand side projects outside the vessel 51 so that the liquid dielectric can drain off at this place and flow away through the outlet 54. In this way provision is made for the constant replacement of the liquid dielectric.

As liquid dielectric there may be employed, besides paraffin oil and other oils, liquids in which mercury does not emulsify—for example, ether. Halogenized carbon and hydrocarbon compounds—for example, carbon tetrachloride—come especially into consideration. There may also be employed, however, substances in which mercury can be finely divided and the spark discharges can pass through emulsions so formed.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A process for converting mercury into another element, characterised by the feature that the mercury is subjected to electric shocks.

2. A process according to Claim 1, characterised by the feature that the mercury is subjected to an electrical spark discharge.

3. A process according to Claim 1, characterised by the feature that the spark-gap is formed by a liquid dielectric—for example, paraffin oil.

4. A process according to Claim 1, characterised by the feature that mercury is introduced into the space between two electrodes the difference of potential of which is so adjusted that the spark only passes when a definite quantity of mercury arrives between the electrodes.

5. A process according to Claim 1, characterised by the feature that mercury drips through a horizontal spark-gap, the individual drops allowing the passage of the discharges.

6. A process according to Claim 3, characterised by the feature that a liquid dielectric is forced through a mass of mercury in such a manner as to cause the production of two layers of mercury electrically insulated from each other.

7. An apparatus for carrying out the process according to Claim 2, characterised by the feature that the dielectric for the spark-discharge consists of a porous mass of insulating material which absorbs in itself a liquid dielectric.

8. A process according to Claim 3, characterised by the feature that there is employed a dielectric in which mercury does not emulsify.

9. A process according to Claim 8, characterised by the feature that ether is employed as dielectric.

10. A process according to Claim 8, characterised by the feature that halogenized carbon compounds especially hydrocarbons—for example, carbon tetrachloride are employed.

11. Process for converting mercury into another element substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 12th day of June, 1925.

HASELTINE, LAKE & Co.,
28, Southampton Buildings, London, England, and
15, Park Row, New York, N.Y., U.S.A.,
Agents for the Applicants.

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Fig. 1

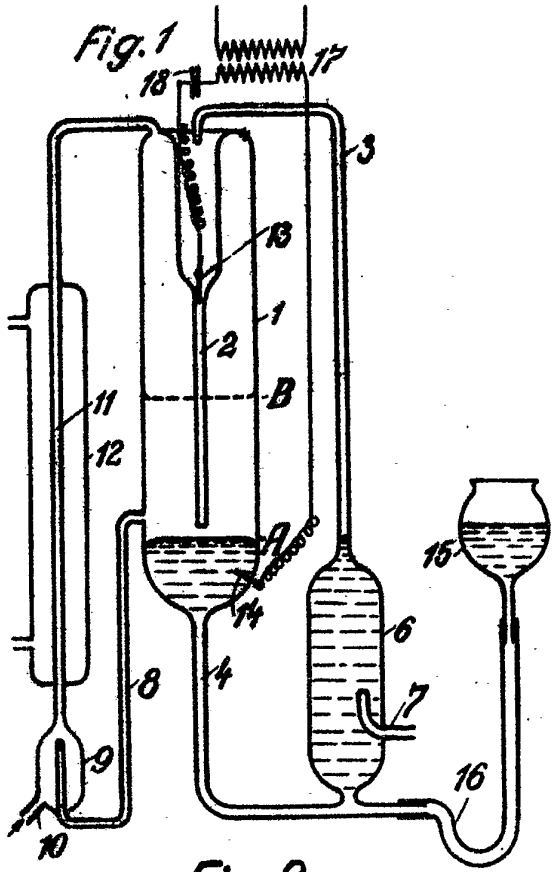


Fig. 3

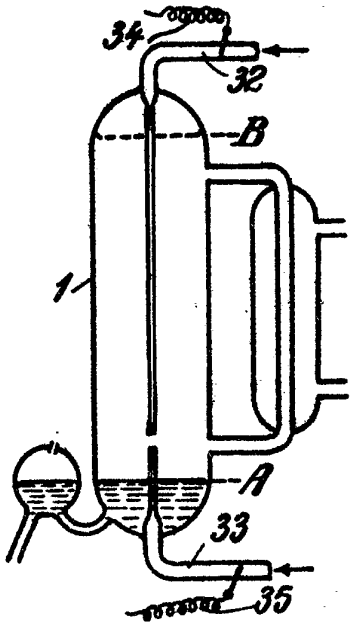


Fig. 2.

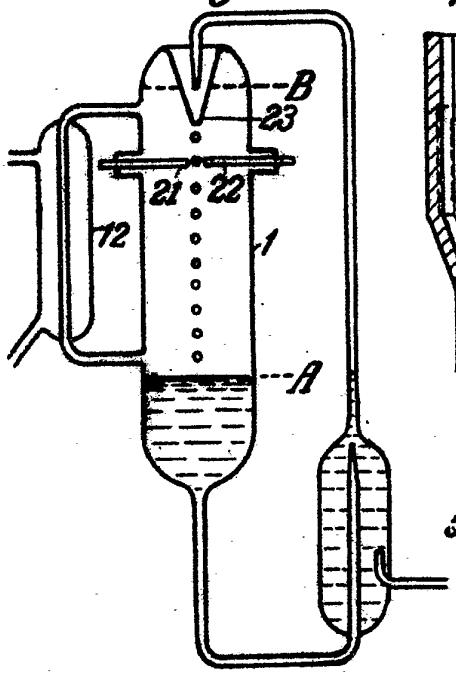


Fig. 4

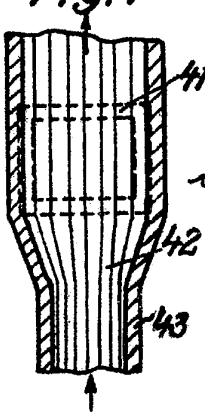


Fig. 5

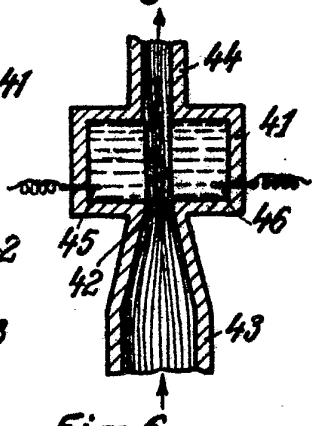
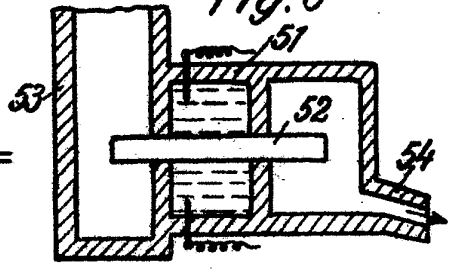


Fig. 6



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