H. SCHMIDT.

PROCESS FOR PRODUCING ELECTRODEPOSITS WHICH CAN BE REMOVED FROM THEIR BASE.

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916,033. Patented Mar. 23, 1909.

Fig. 1.

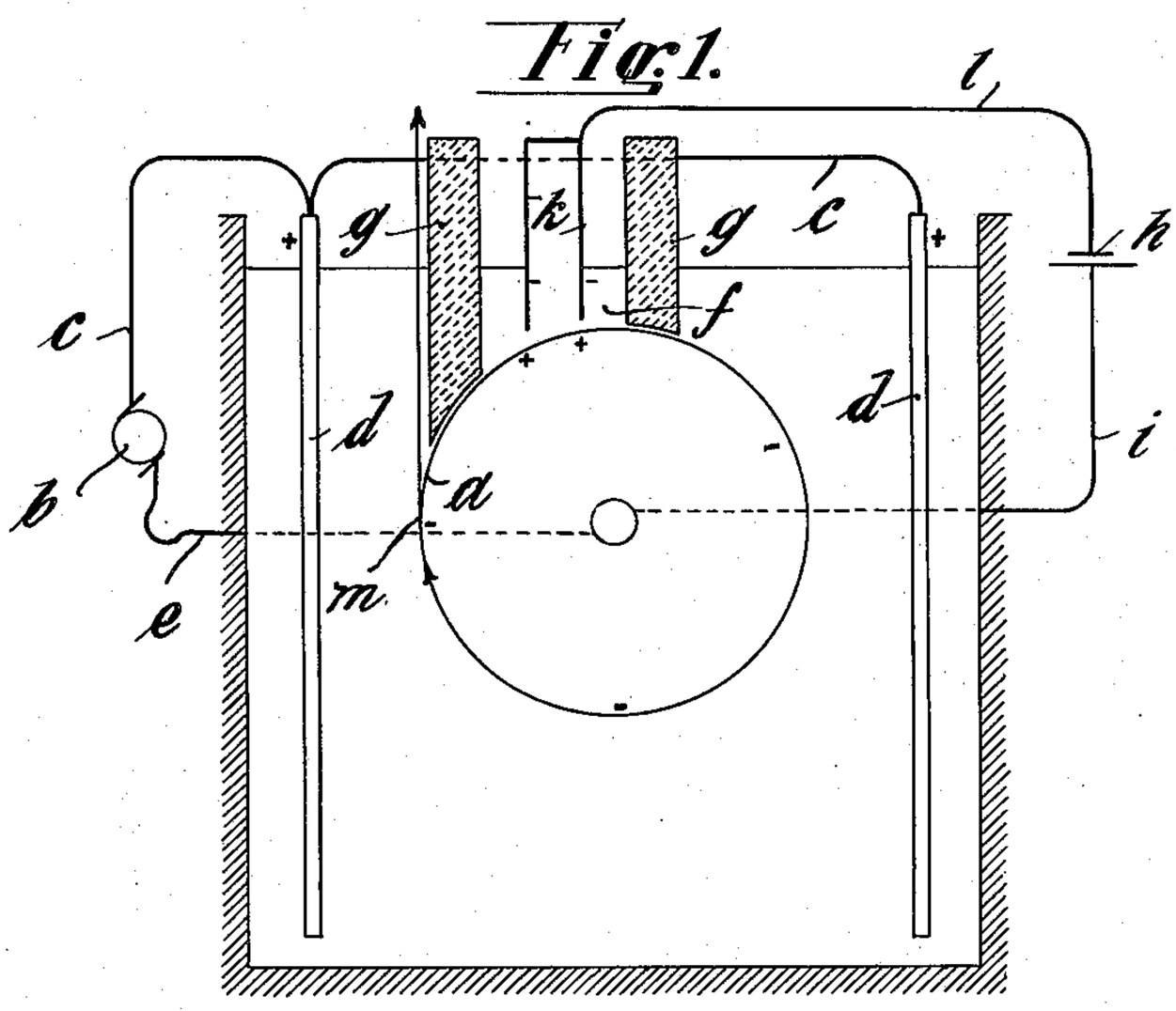


Fig. 2.

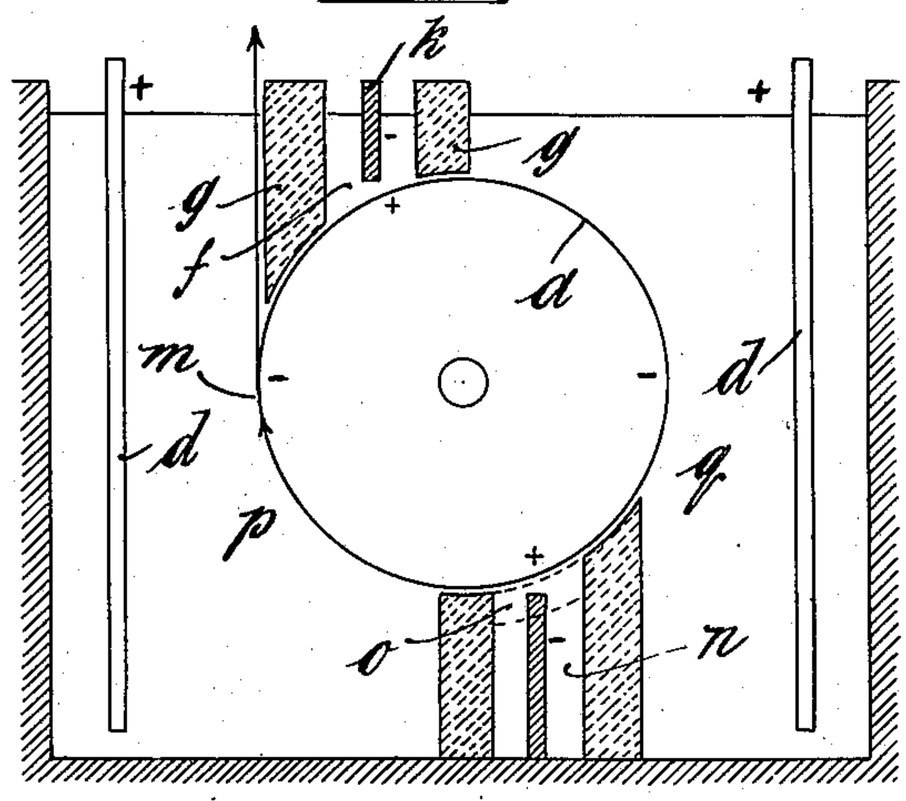
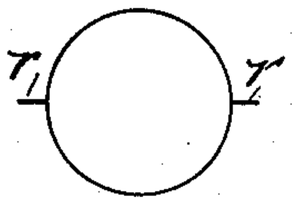


Fig. 3.

Fig. 4.



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HARRY SCHMIDT, OF COLOGNE, GERMANY.

PROCESS FOR PRODUCING ELECTRODEPOSITS WHICH CAN BE REMOVED FROM THEIR BASE.

No. 916,033. Specification of Letters Patent. Patented March 23, 1909.

Application filed August 9, 1907. Serial No. 387,792.

To all whom it may concern:

Be it known that I, HARRY SCHMIDT, a subject of the King of Prussia, residing at Cologne-on-the-Rhine, in the Kingdom of Prussia and German Empire, have invented a new and useful Improvement in Processes for Producing Electrodeposits which Can Be Removed From their Base, of which the following is a specification.

This invention relates to improvements in the production of electrometallic deposits, which can be readily removed from their base, (cathode) and is characterized by anodically polarizing the base (which is to serve as cathode and which may be soluble in the particular electrolyte) in the electrodepositing bath by an electric current whose electromotive force is such as not to produce a visible change of the base, whereby there can be produced, by way of example metal sheets or foil, having glossy surfaces without burnishing, and even of such extreme thinness that burnishing would be impracticable, whereas according to the known method of preventing adhesion of an electrodeposit to its base by producing a film of oxid on the surface of the base, by reversing the electric current for a very short time, no particular regard could be had to the surface polish. Said known method has also the drawback that the cathode can only be used once without being prepared again, while according to the present invention a large number of deposits can be drawn off the cathode when once prepared.

If a metal plate anodically polarized as above stated is used as the cathode, an electrodeposit is obtained, whose thickness depends on the strength and duration of the electric current. This cathode, thus provided with a metal coating, can be again anodically polarized and then provided with a new electrodeposit. By repeating this operation any number of times an electrodeposit is obtained, which can be divided into its separate layers. If these separate layers are very thin, the whole electrodeposit can be ground or crushed to form metal bronze.

The electromotive force employed for the anodicpolarization in order to prevent the deposit from adhering is different according to the nature of the metal to be deposited, and is greater according as the deposit is thinner. For example, the electromotive force at the binding screws of the bath in which the anodic polarization is carried out, when producing thick electrodeposits is 0.8 volts or less and in producing nickel foil of the thickness of tin foil is 1.3 volts, while in producing metal deposits which are suitable for being ground to form bronze about 3 volts are employed. The anodic polarization up to the desired degree is usually obtained in one of two ways, that is: either by using a current whose electromotive force is greater than that necessary for obtaining the desired degree of polarization, in which case, the time during which the current is allowed to act must be very carefully regulated, so that the desired degree of polarization is reached and not exceeded; or by using an auxiliary source of electricity for the anodic polarization whose electromotive force just suffices to produce the desired degree of polarization, in which case, the source of electricity can be switched in for any length of time, without the degree of polarization being exceeded, because the current ceases to flow as soon as the desired degree of polarization is reached. Supposing, for example, that the polarizing electromotive force or tension required for any given purpose is 1.5 to 1.6 volts, then a battery consisting of two cells each yielding about 0.8 volts might be used.

Both methods mentioned have advantages and drawbacks. According to the first process, it is possible to work quicker than according to the second process, the operation however is not so certain in the first case, owing to a nonuniform distribution of the current, which drawback is avoided by the second process.

The invention can also be employed to produce metal foil in an endless strip and hollow bodies as will be evident from the drawings in which—

Figure 1 is a diagrammatic view of the cylinder used for producing metal foil in endless strips. Fig. 2 shows the method of applying the templets in making hollow bodies, and Figs. 3 and 4 show two different stages in makng an endless pipe.

For producing metal foil in an endless strip a rotary cylinder *a* is used as cathode, the current passing from the source *b* through the wire *c* to the anodes *d* and from thence to the cylinder *a* and through the wire *e* back to the source *b*. This current deposits metal on the cylinder, which metal as the cylinder rotates passes through the space *f* isolated

from the bath by the partitions *g* and becomes anodically polarized by a current passing from the battery *h* through the wire *i* to the cylinder *a* and from thence to the plates *k* and the wire *l* back to the battery *h*. If the deposited metal foil is drawn off the cylinder *a* at some point *m* before the isolated part of the bath, an endless strip of metal foil is obtained. If the deposit is left on the cylinder, a strip of metal foil of any desired length will be spirally deposited on the cylinder. This method can also be employed for producing extremely thin foil suitable for being ground to form bronze. In this case the speed of rotation of the cylinder must be greater in accordance with the thinness, and instead of the cylinder a disk should preferably be used.

Fig. 2 shows how an endless hollow pipe may be made. At *f* the whole length of the cylinder is anodically polarized, while at a second isolating space *n* templets *o* are provided to cover the metal deposit, along certain lines where it will not therefore be anodically polarized. As a consequence the metal deposited on the cylinder when passing through, *p* will adhere to that deposited when passing through *q* along the lines covered by the templets, while both said deposits will be separate where the first deposit has been polarized in passing through the space *n*. The endless strip taken off the cylinder at *m* will therefore have the section shown in Fig. 3. By cutting said strips longitudinally at *r* separate pipes are obtained as shown in Fig. 4. In this way hollow bodies of various shapes such as bags, for sweetmeats, endless thin pipes, etc., can be made.

What I claim and desire to secure by Letters Patent is:—

1. The process for producing electrodeposits which can be removed from their base, which consists in using the base as anode at an electromotive force at which no visible alteration takes place, and in then electrodepositing a metal on said base, substantially as set forth.

2. The process for producing electrodeposits which can be removed from their base, which consists in electrodepositing a metal layer on a rotary cylinder, continuously anodically polarizing said layer and in electrodepositing metal on said first anodically polarized layer, substantially as set forth.

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

HARRY SCHMIDT.

Witnesses:
LOUIS VANDORY,
M. KNEPPERS.