

No. 607,484.

Patented July 19, 1898

J. RIEDER.

PROCESS OF AND APPARATUS FOR PRODUCING RELIEFS IN METAL.

(Application filed Dec. 21, 1897.)

(No Model.)

FIG. 1.

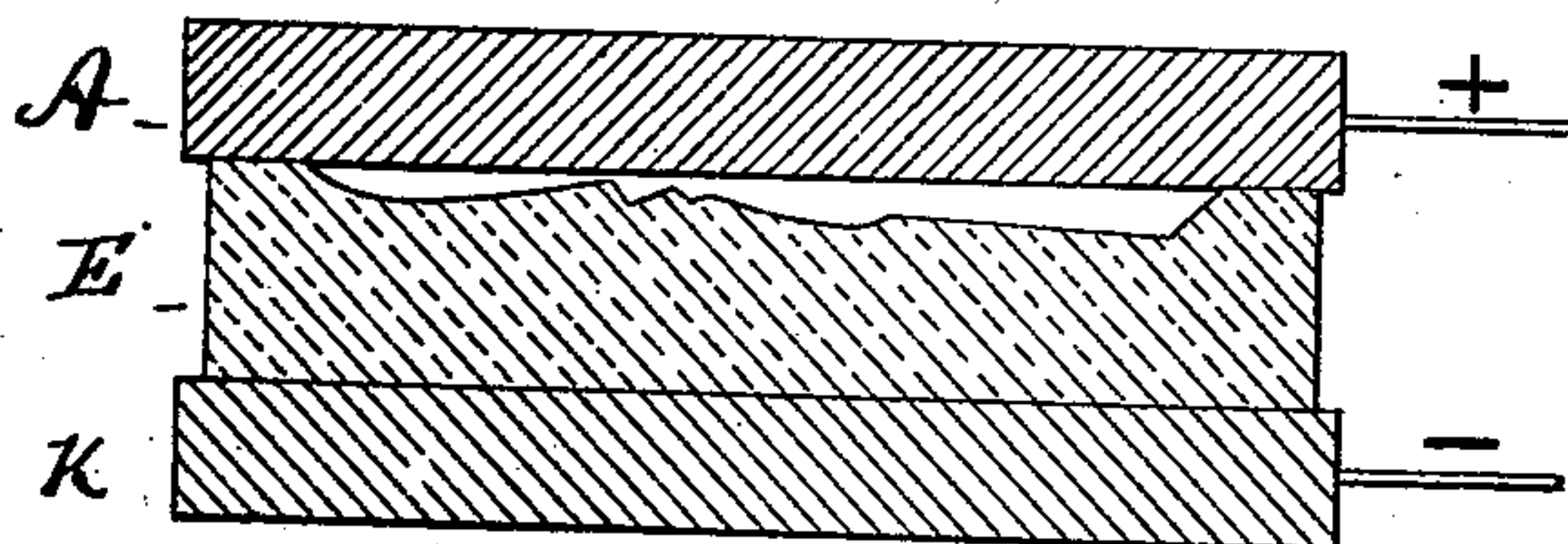


FIG. 2.

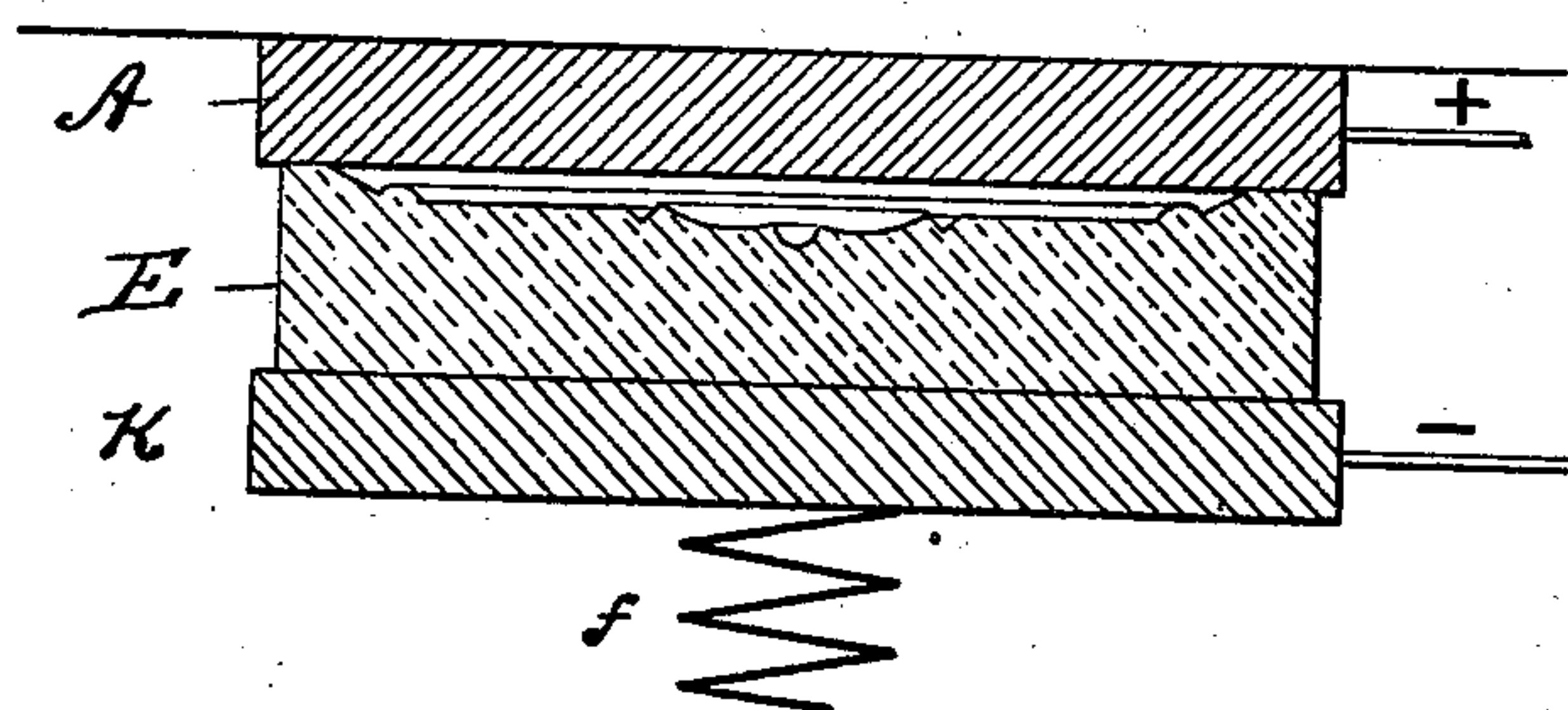
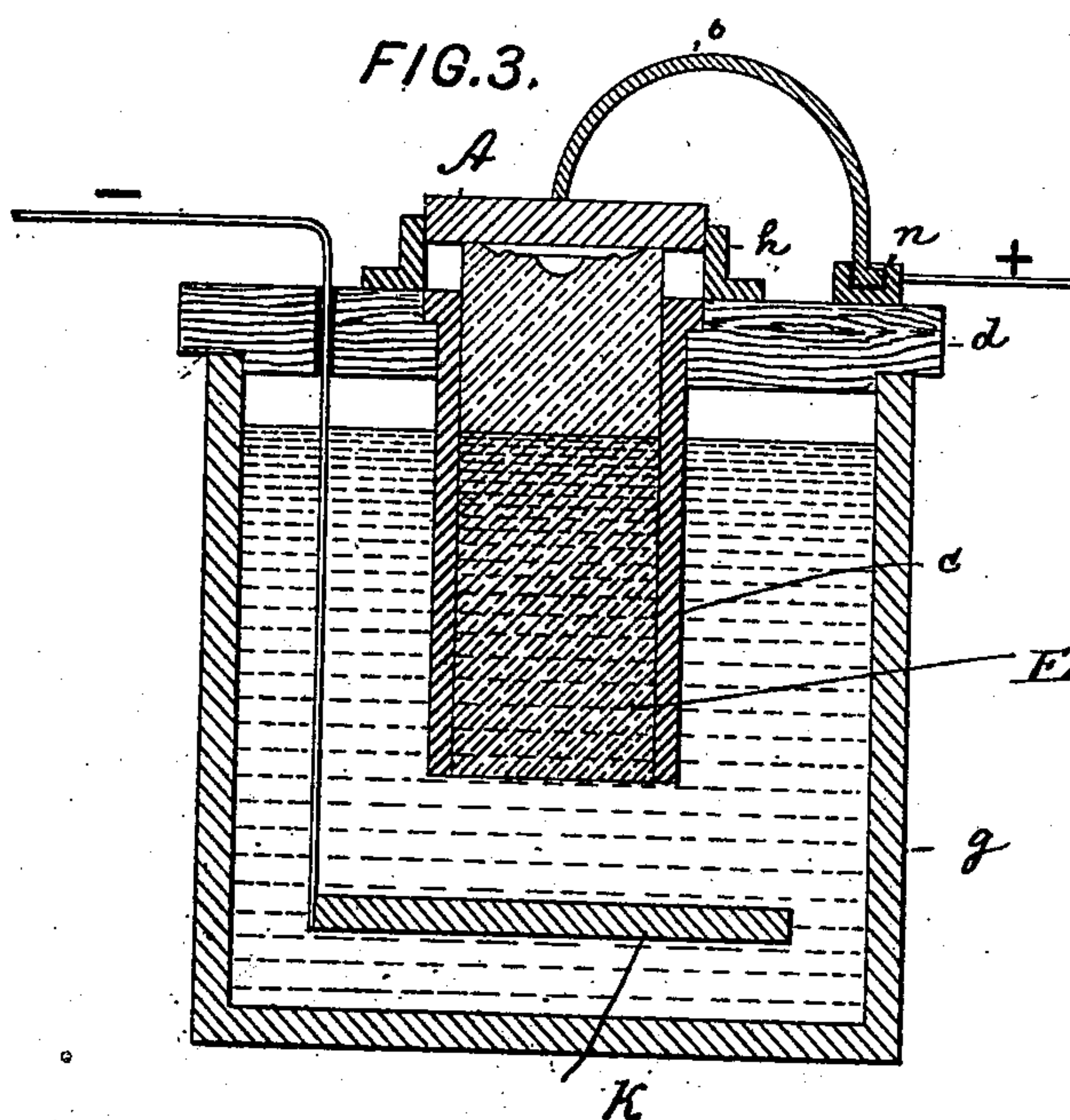


FIG. 3.



Witnesses:  
John Decker.  
William Miller.

Inventor:  
Josef Rieder  
by his attorneys  
Roeder & Briesen



# UNITED STATES PATENT OFFICE.

JOSEF RIEDER, OF MUNICH, GERMANY.

## PROCESS OF AND APPARATUS FOR PRODUCING RELIEFS IN METAL.

SPECIFICATION forming part of Letters Patent No. 607,484, dated July 19, 1898.

Application filed December 21, 1897. Serial No. 662,842. (No model.) Patented in Germany February 7, 1897, No. 95,081; in France June 30, 1897, No. 268,332, and in England June 30, 1897, No. 15,617.

*To all whom it may concern:*

Be it known that I, JOSEF RIEDER, a subject of the King of Bavaria, and a resident of Munich, Kingdom of Bavaria, Germany, have invented new and useful Improvements in Processes of and Apparatus for Producing Reliefs in Metal, (for which I have obtained the following patents: in Germany, No. 95,081, dated February 7, 1897; in France, No. 268,332, dated June 30, 1897, and in Great Britain, No. 15,617, dated June 30, 1897,) of which the following is a specification.

The present invention consists of a new process of and apparatus for reproducing reliefs in metal by means of electrolysis.

The process consists in first taking an impression of the relief on one side of a porous block of, say, plaster-of-paris, English cement, terra-cotta, natural stone, or the like. The impression may be attained by casting in the case of plaster-of-paris, by pressure and subsequent firing in the case of terra-cotta and the like, or by engraving in the case of natural porous stone, and in order to render the present specification more easily intelligible reference is had to the accompanying drawings, in which similar letters of reference denote similar parts throughout the several views.

Figure 1 is a diagram of one form of carrying the invention into practice; Fig. 2, a similar representation of a modified form; Fig. 3, a similar representation of a further modification.

In the drawings, E represents the block or mold, of plaster-of-paris or the like, on which a plate of suitable metal (designated by the letter K) is laid, said plate being in connection with the negative pole of a suitable source of electricity. On the embossed or relief side of the block E is placed the metal plate which is to receive the embossment or relief, said plate being designated by the letter A and in connection with the positive pole of a battery. If now the block E is saturated with an electrolyte which will dissolve the metal of the plate A, an electrolytic apparatus will be formed, in which E represents the receptacle with the electrolyte, A the anode, and K the cathode. If the current is passed

through the apparatus thus formed, metal will be dissolved from the plate A in the well-known manner at all points of the same which come into contact with the porous block E. By constantly adding fresh electrolyte to the block finally all parts of the metal plate A will come into contact with the same, and as soon as this has taken place the plate will be finished.

This process will not suffice for making big reliefs, in which case it is necessary to press the plate K against the block E by means of a spring device f.

The process may be employed for making steel stamps for coins, for copying coins and medals, for providing metal parts or mountings with relief-like ornamentations, for making clichés for printing purposes, and for boring holes in hard steel and many other similar purposes.

In carrying the above-described process into practice the electrolyte must be carefully chosen, the current must be properly regulated, and various auxiliary devices will have to be employed, which do not, however, make any difference in the main system of the process.

Thus one form of carrying the invention into practice is shown at Fig. 3, this device serving mainly for copying coins, the three main parts of the device—the plates A and K and the block E—differing only in embodiment from those described with reference to the diagrams. The block E is mounted in a protecting-sleeve c and the connection between block E and the cathode K is formed by the electrolyte in the receptacle g. The sleeve c is supported in the cover d, which also carries a form or guide plate h, in which the anode A fits, so that the same, if removed, may be replaced in the mold in exactly the same position. The anode A is pressed against the mold-block E by means of a bow-spring b, secured to cover d at n, so that as the plate A is dissolved it will gradually sink into the mold. In order to get a good clean reproduction, it is necessary to remove the plate A at suitable intervals and brush off or otherwise remove the dissolved metal from the same. The plate A may be cleaned by means of a



rotary brush of any known construction, and any suitable device may be employed to remove and replace the same automatically.

I claim as my invention—

5 1. A process for reproducing reliefs and the like in metal by means of electrolysis, which consists in first producing on a porous mass a negative of the original to be copied, pressing a plate connected with the cathode of an  
10 electrolytic cell to one side of said block, placing the plate on which the relief is to be reproduced at the negative side of said block and constituting the same the anode, supplying the electrolyte to the porous block and  
15 supplying an electric current substantially as described.

2. A process for reproducing reliefs and the like in metal by means of electrolysis, which consists of first producing on a porous mass  
20 a negative of the original to be copied, pressing a plate connected with the cathode of an electrolytic cell against the plain side of said block, placing the plate on which the relief is to be reproduced at the negative side of  
25 said block and constituting the same the anode, gently pressing said plate on said block, supplying an electrolytic solution to said block and supplying an electric current in the

manner and for the purpose substantially as described. 30

3. A device for carrying out the process of reproducing reliefs by means of electrolysis, which consists of the combination of a receptacle having suitable cover, a sleeve mounted in said cover and extending downwardly into  
35 said receptacle, a block of porous material in said sleeve, a guide-frame on the top of said cover for the metal plate, a metal plate to receive the relief, means for gently pressing the same on said block, a cathode below said block  
40 and connections from the said plate to the positive pole of a battery in the manner and for the purpose substantially as described.

4. An electrolytic apparatus composed of a cathode, a porous mold-block, an anode in  
45 contact therewith, and an electrolyte that saturates the mold-block, substantially as specified.

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

JOSEF RIEDER.

Witnesses:

EMIL HENZEL,  
GEORGE BOOS.