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F., F. H. & W. A. ENGELHARD.

SUPPORT FOR ANODES.

APPLICATION FILED SEPT. 14, 1905.

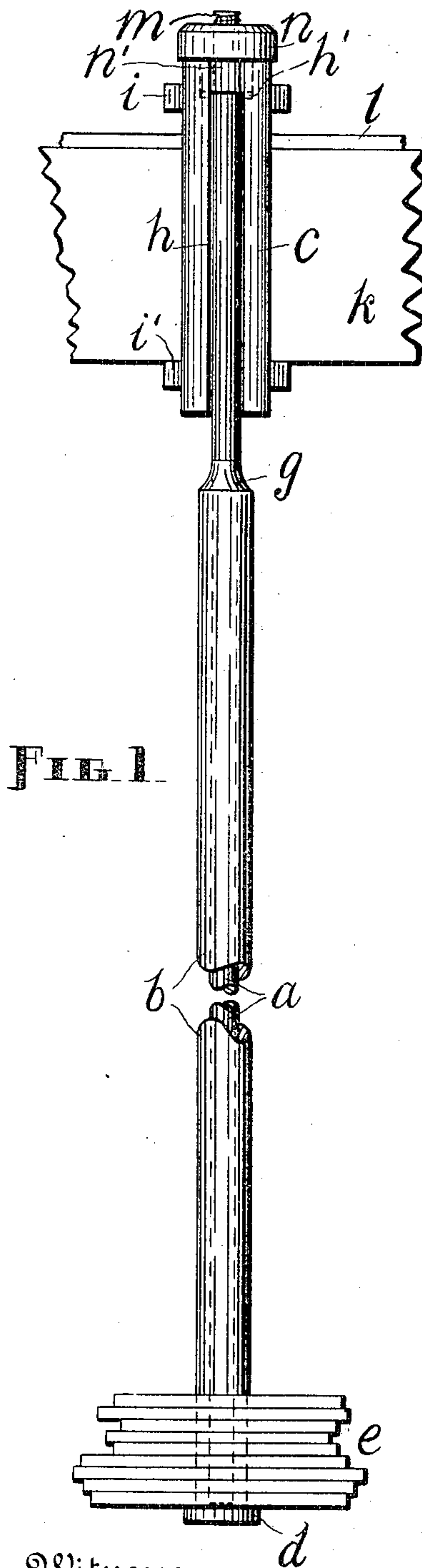


FIG. 1

Witnesses
J. M. Sterns.
A. P. Fairbanks.

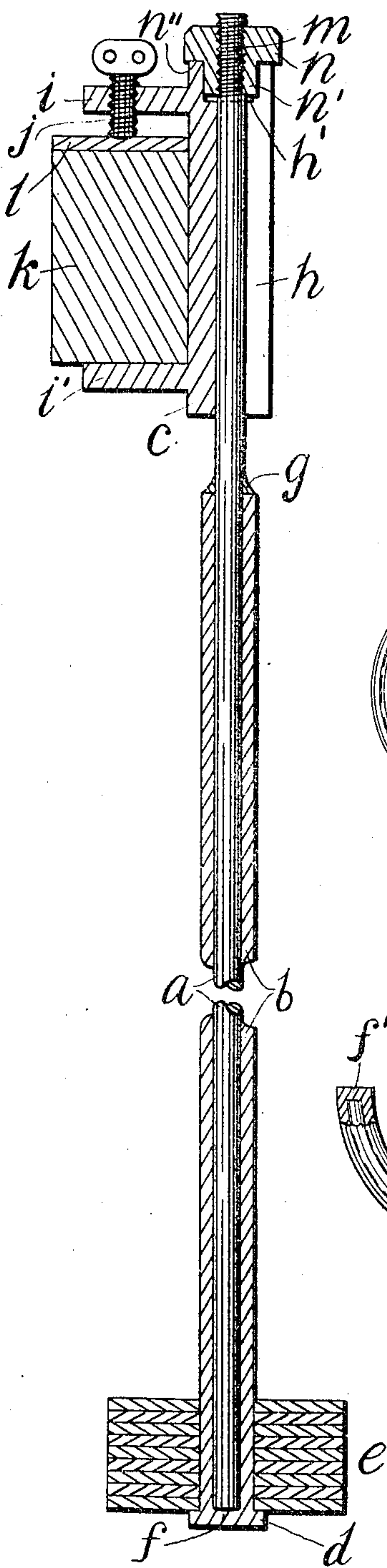


FIG. 2

Inventors
Frank Engelhard,
Frederick H. Engelhard
and William A. Engelhard,
by Webster & Co., Attorneys

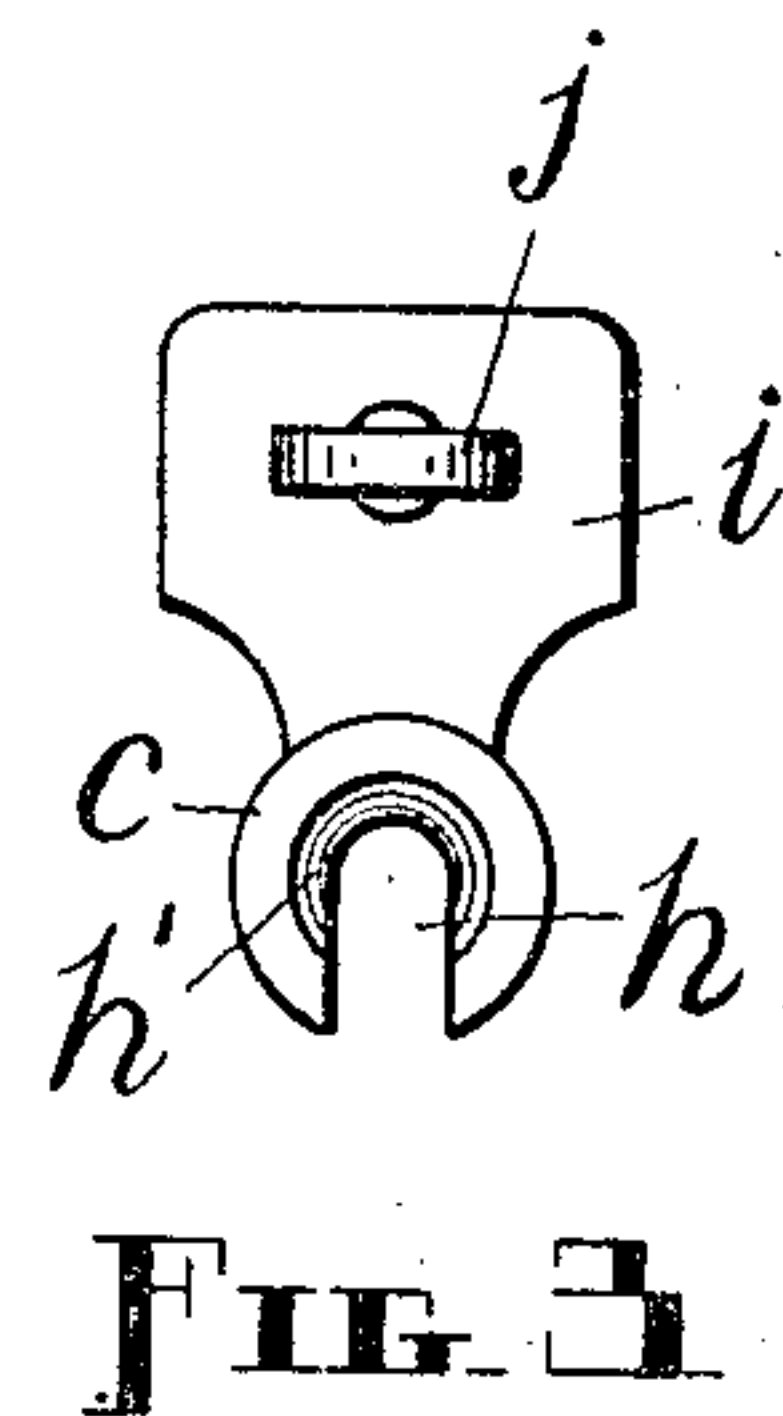


FIG. 3

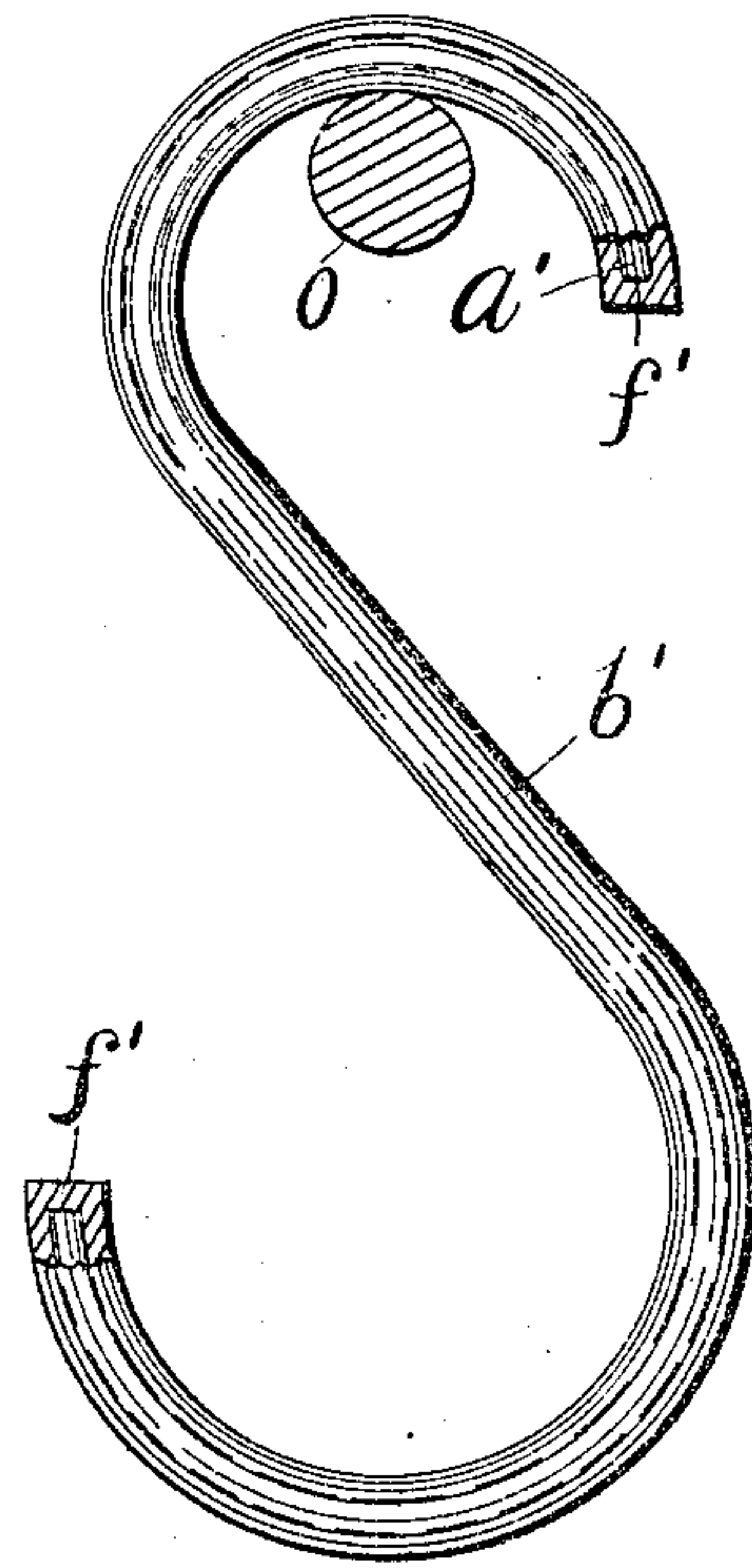


FIG. 4

UNITED STATES PATENT OFFICE.

FRANK ENGELHARD, FREDERICK H. ENGELHARD, AND WILLIAM A. ENGELHARD, OF SPRINGFIELD, MASSACHUSETTS.

SUPPORT FOR ANODES.

No. 825,591.

Specification of Letters Patent.

Patented July 10, 1906.

Application filed September 14, 1905. Serial No. 278,415.

To all whom it may concern:

Be it known that we, FRANK ENGELHARD, FREDERICK H. ENGELHARD, and WILLIAM A. ENGELHARD, citizens of the United States of America, residing at Springfield, in the county of Hampden and Commonwealth of Massachusetts, have invented new and useful Improvements in Supports for Anodes, of which the following is a specification.

Our invention relates to improvements in devices for suspending or supporting anodes in electrolyte or electrolytic fluid for any and all kinds of electrodepositing; and it consists of a support possessing the necessary characteristics, which are more particularly strength sufficient to maintain the weight imposed and endure the strain incident to its use, imperviousness to the fluid in which it may be immersed in whole or in part, freedom from all liability of contaminating such fluid, adaptitude for readily receiving the load to be carried thereby, and capacity to serve as a conductor for electricity, as hereinafter set forth.

The object of our invention is to provide a device for supporting anodes in plating solutions through the medium of which cruder forms of anodes than heretofore can be utilized, such as the tops or unused portions of old anodes which have usually been thrown away or sold for old metal or junk, ingots, any form, in fact, and utilized without waste, whereby a great saving in expense is experienced.

As is well known it is customary to provide anodes with some fastening means at the top to enable the same to be suspended in the fluid and to leave enough of the anodes when so suspended above the fluid so that such fastening means will not be affected thereby; otherwise the support would soon become destroyed by the corrosive action of the fluid and permit the anodes to fall and interrupt, interfere with, or defeat the successful carrying out of the electroplating process.

Our invention does away with the necessity of providing fastening means and permits the whole anode to be immersed in the fluid, thus effecting a double saving, besides affording convenient means for using any kind or form of anode.

Since lead is impervious to the electrolytes commonly used, while possessing most of the other characteristics necessary for the pur-

poses of our invention, that is one of the metals which we prefer to employ in the construction of our support and to supply any additional degree of strength which may be needed, strength being the only characteristic likely to be deficient in lead, with brass, owing to the fact that brass is a good conductor of electricity and is otherwise eminently suitable. It will be clear, however, that for some electrolytes some metal other than lead might be employed, and of course brass is not the only strengthening medium available. Except for the additional need of strength lead alone would be sufficient for the support and will be perhaps in some cases where the load is quite inconsiderable; but for most practical purposes the bimetallic construction must be resorted to.

The anodes used with our invention may be pierced from side to side to enable them to be slipped onto either the straight or the curved support, or the bottom anode thus arranged on the straight support may serve as a shelf for the others which need not be pierced, or all imperforate anodes can be utilized provided the supports are furnished with flanges, brackets, or equivalent members of sufficient size to permit such anodes to be laid thereon, it being understood that we are not to be restricted in any way in this matter.

In the accompanying drawings, in which like letters of reference designate like parts throughout the several views, Figure 1 is a front elevation of one form of our support, the middle portion being broken out; Fig. 2, a vertical section through the same, taken at right angles with the position in which the parts stand in the previous view; Fig. 3, a plan view of the holder; and Fig. 4, a side elevation of another form of support, the ends being in section.

For heavy work the straight support has been found to be most practicable, the curved support being suitable only for lighter work. We will first describe the straight support, reference being had to the first three views of the drawings. Such support comprises a strong rod *a*, of brass or other suitable material, which is a conductor of electricity, a pipe or tube *b*, usually of lead, inclosing all but the upper portion of said rod, and a suitable holder *c*. The tube *b* has a flange *d* around the lower end thereof, on which rest the anodes *e*. The rod *a* does not extend

quite to the bottom of the tube *b*, although there is a passage clear through said tube, and the opening thus left is filled with lead, as shown at *f*, which is "burned," so as to unite with and become practically a part of the tube itself, while a "wiped" lead joint *g* is made at the top of the tube. Thus it will be seen that no portion of said rod can come in contact with any of the plating fluid, because the device is never introduced into such fluid below the aforesaid joint *g*. Hence there can be no decomposition of said device, which would be deleterious to the fluid and ruin the device, the necessary strength is adduced, and a good electrical conductor afforded. The joint *g* firmly unites the tube *b* with the rod *a* and cannot be broken by any weight which the support is designed to carry.

The holder *c* is provided as a convenient medium of suspension, although something else may do as well. Such holder is a cylindrical body having a longitudinal slot *h* extending from the periphery into the center and being a little larger than the rod *a*, except at the upper terminal at *h'*, where there is an enlargement or recess; but such recess does not extend to the periphery of said body, and said holder is provided with rearwardly-projecting horizontal lugs *i* and *i'*. A thumb-screw *j* is in engagement with the threaded sides of an opening in the upper lug *i*. The lugs *i* and *i'* and the thumb-screw *j* serve in the capacity of a clamp for attaching the holder *c* to the supporting-rail of an electrolyte-tank and for making a good electrical connection with the conductor on said rail. In the drawings, *k* represents such a rail, and *l* such a conductor. The upper end of the rod *a* is screw-threaded at *m*, and a nut *n* is provided to screw onto said end, such nut having a diminished part *n'*, which fits snugly into the recess *h'*, and a shoulder *n''*, which when in place rests upon and supports the rod *a* from the top of the holder *c*, thus making a good electrical contact between said holder and rod, as well as securing the latter in position.

In practice, assuming that the holder *c* is in place and fastened to the bar or rail *k* and conductor *l* by means of the lugs *i* and *i'* and the thumb-screw *j*, the desired number of anodes *e* are first slipped onto the tube *b*, the bottom anode resting on the flange *d*. Next the nut *n* is screwed onto the rod *a*, and then said rod, with its load, is lifted and swung into the slot *h* until the part *n'* of said nut is directly over the recess *h'*, when the supporting members are lowered with said part *n'* in such recess until the shoulder *n''* comes to rest on the top of the holder *c*. The device and anodes now need no further attention and can be left thus suspended until the latter are entirely consumed by the fluid, if desired. To remove the rod *a* from the holder *c*, simply elevate said rod sufficiently for the nut *n* to

clear said holder and then swing the rod forward out of the slot *h*. Of course there must be enough space between the bottom of the holder *c* and the joint *g* to permit the amount of vertical movement on the part of the rod *a* necessary to get the lower part *n''* of the nut *n* into and out of the recess *h'*. Before more anodes are placed on the tube *b* the nut *n* must be removed from the rod *a*.

In Fig. 4 a support in the shape of the letter *S* is shown (any other shape having a hooked terminal or terminals may be used instead) suspended from a member *o*, which is a combined supporting-rod and electrical conductor. This support consists merely of an interior rod or wire *a'* and an exterior pipe or tube *b'*, both bent so that the device has hooked terminals, and a lead filling *f'* in each end of said tube to close the same and protect said wire from the fluid, as before. By preference the rod *a'* is of brass and the tube *b'* of lead. One hooked terminal of the Fig. 4 support is passed through one or more anodes (not shown) and the other hooked terminal is placed over the member *o* in practice, by which means the anodes may be wholly immersed in the fluid, the same results as to efficiency and economy being obtained as in the other case.

Both lead and brass are conductors of electricity, so the current is in no wise interrupted or retard by the use of our devices.

From the foregoing it is clear that a great number of different shapes may be given our support and various structural changes made therein without departing from the nature of our invention.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. As a new article of manufacture, an anode-support comprising a comparatively strong interior electrical conducting member, a weaker exterior electrical conducting member, the latter being impervious to the electrolyte and completely covering the lower portion of the interior member.

2. As a new article of manufacture, an anode-support comprising a comparatively strong rod, a tube secured by a wiped joint at the top to such rod, said tube being impervious to electrolytes and both the tube and rod being electrical conductors, and an impervious filling in the base of the tube under the rod.

3. As a new article of manufacture, an anode-support comprising a comparatively strong rod, an externally-flanged tube secured to such rod, said tube being impervious to electrolytes and both the tube and rod being electrical conductors, and a filling impervious to an electrolyte in the base of the tube under the rod.

4. The combination, in an anode-support, with a holder adapted to be fastened to a supporting-bar and electrical conductor, of an

electrical conducting-tube closed at the base and adapted to carry anodes, such tube being impervious to electrolytes, and an electrical conducting-rod, which is comparatively strong, inserted in said tube and secured thereto, said rod at its upper end projecting above the tube and being adapted to be engaged with and disengaged from said holder.

5. The combination, in an anode-support, with a holder adapted to be fastened to a supporting-bar and electrical conductor and having a longitudinal slot therein with a recess at the top, of an electrical conducting-tube closed at the base and adapted to carry anodes, such tube being impervious to electrolytes, an electrical conducting-rod, which is

comparatively strong, inserted in said tube and secured thereto, said rod at its upper end projecting above the tube and being adapted to enter and leave the slot in said holder, and a removable nut, at the top of the rod, having a part receivable in the aforesaid recess.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

FRANK ENGELHARD.

FREDERICK H. ENGELHARD.

WILLIAM A. ENGELHARD.

Witnesses:

RICHARD PIEHL,

F. A. CUTTER.