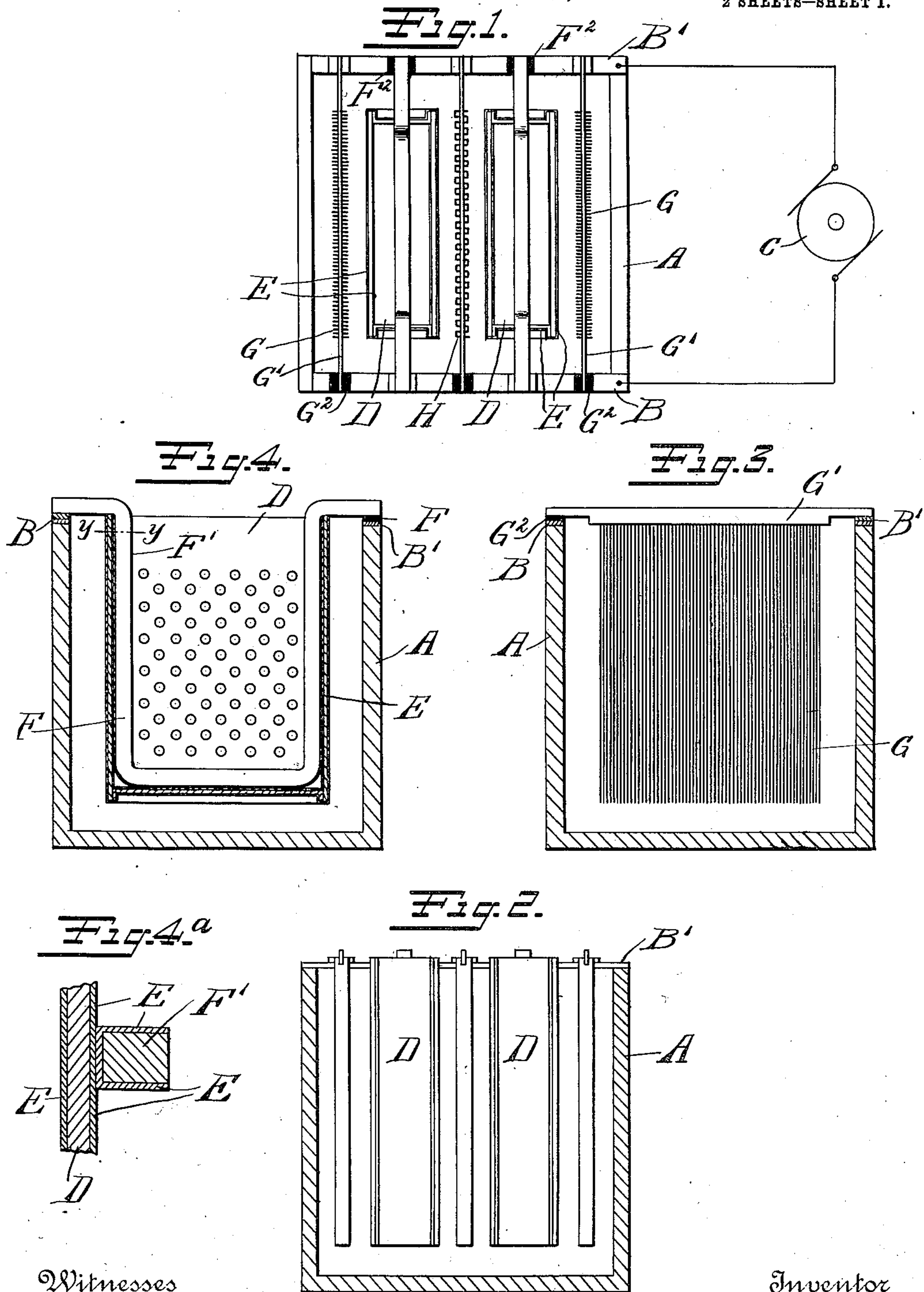


No. 843,616.

PATENTED FEB. 12, 1907.

M. LEITCH.
DETINNING APPARATUS.
APPLICATION FILED JULY 5, 1906.

2 SHEETS—SHEET 1.



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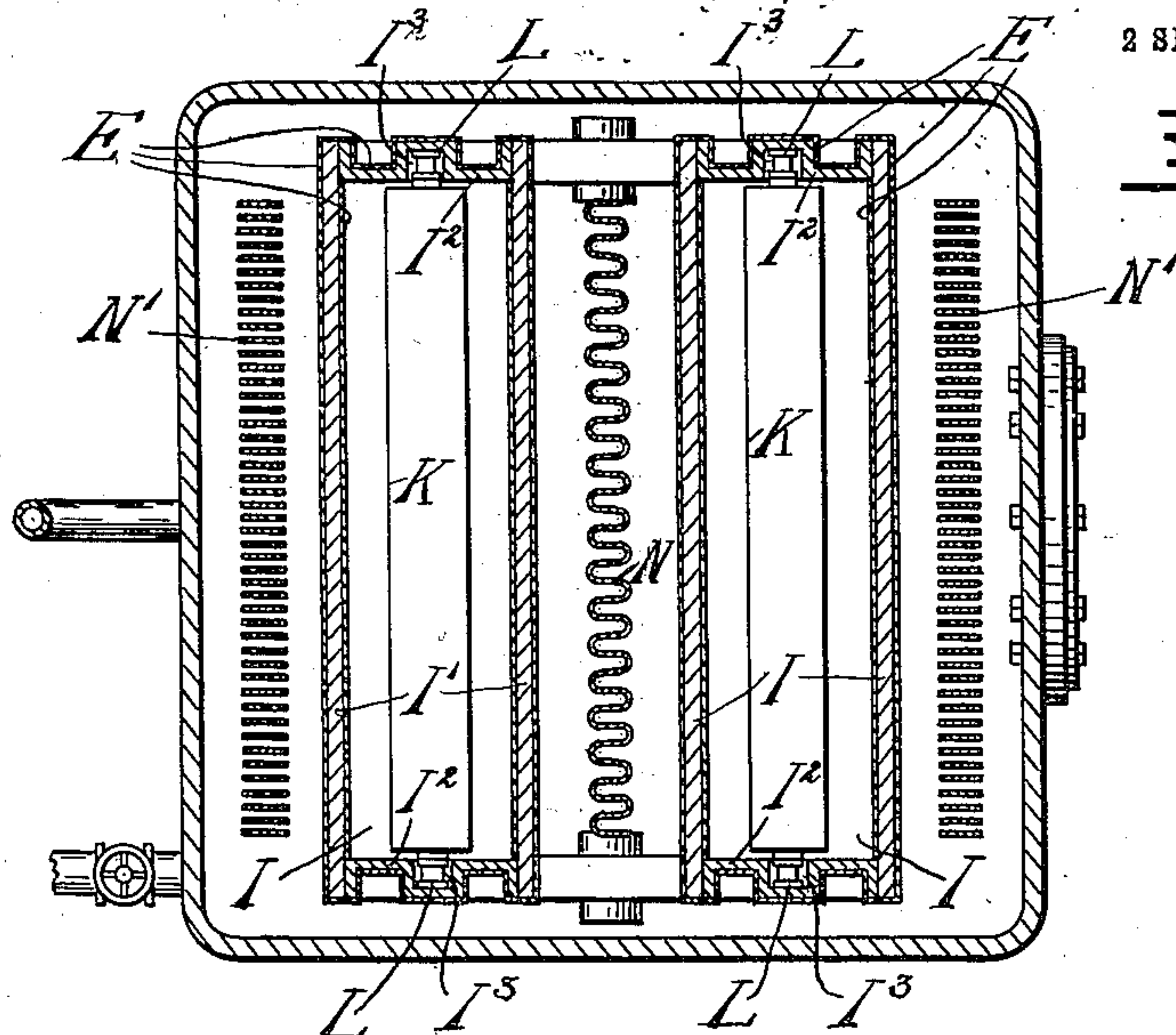


Fig. 6.

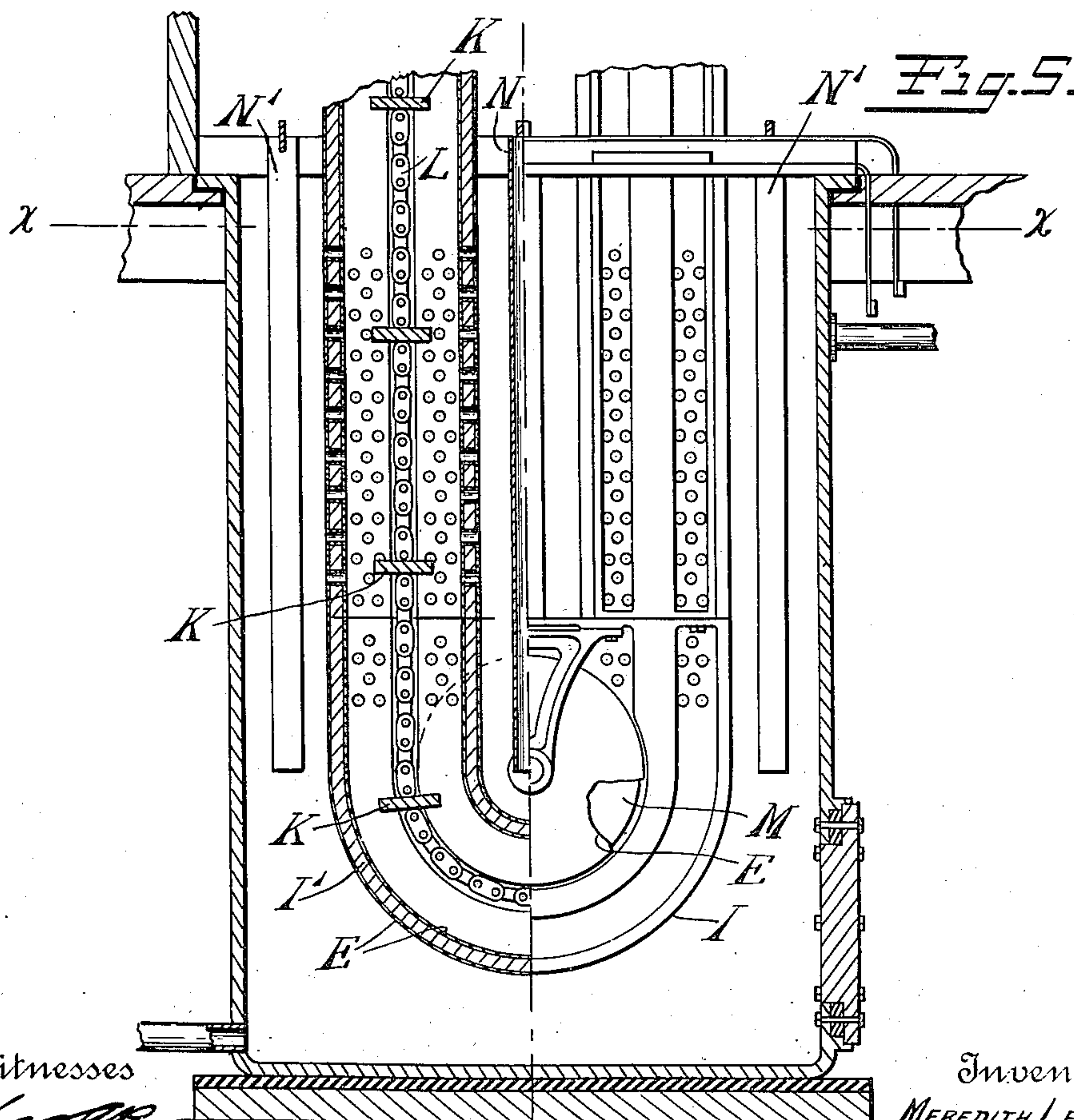


Fig. 5.

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DETINNING APPARATUS.

No. 843,616.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed July 5, 1906. Serial No. 324,825.

To all whom it may concern:

Be it known that I, MEREDITH LEITCH, a citizen of the United States, residing at Elizabeth, Union county, New Jersey, have invented certain new and useful Improvements in Detinning Apparatus, of which the following is a full, clear, and exact description.

My invention relates to electrolytic apparatus for use in detinning tin-scrap, and has for its object to provide an apparatus which with a given amount of electrical energy will accomplish an increased amount of work.

Heretofore in commercial electrolytic detinning-baths it has been customary to place the scraps to be treated in metallic baskets which are connected to the positive pole of an electric circuit, so as to form an anode. In these baskets the conducting-surface of the basket is very large and enters into competition with the tin on the tin-scrap, so that a large amount of electrical energy is consumed in liberating the oxygen at the exposed surfaces of the baskets and is thus diverted from performing useful work upon the anode. In commercial apparatus the cathodes are placed around or outside the baskets. The baskets thus come between the scrap and the electrodes and occupy the most advantageous position for intercepting the current.

One feature of my invention consists in partially coating or wholly enameling the metallic baskets with some insulating material, such as vitreous enamel, which will resist the action of the electrolyte, and thus prevent the competition and diversion above referred to. The more complete the enameling the more effectually is the loss of energy prevented. In practice, however, I prefer to leave portions of the inner surface of the basket or its support unenameled, so that the scrap may make electrical contact therewith, and thus be connected through the basket with the positive pole.

Enameling to any extent removes a corresponding portion of the surface of the basket from competition with the scrap and to that extent embodies my invention and secures its advantages. For a given output of work the enamel reduces the amperage necessary to perform that amount of useful work. In practice I preferably use a bath of caustic soda and make the baskets of enameled iron, thereby securing the advantages of a me-

tallic structure and at the same time providing a base the exposed parts of which will be practically unaffected by the electrolyte.

Another feature of my invention results in reducing the voltage necessary to accomplish the passage of a given amperage by reducing the resistance of the cell without increasing the useless surface exposed to the electrolyte. This I accomplish by providing a cathode which has a plurality of surfaces opposed to one another, so as to greatly increase its exposed surface.

One form of cathode embodying my invention is provided with corrugations. Another is that of a comb in which the resistance through the electrolyte from a given portion of the scrap to both the front and back of a neighboring portion of the cathode is substantially the same. Where the cathode has tin-scrap on both sides, the corrugated form may be used with advantage.

While I preferably make the cathodes of iron, any metal which will not be attacked by the electrolyte to too great an extent can be used. By my invention I am able to make substantially all the amperes effective in doing useful work.

The following is a description of apparatus embodying my invention, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of a bath embodying my invention. Fig. 2 is a sectional elevation of the same. Fig. 3 is a detail showing a side view of one of the electrodes. Fig. 4 is a detail view showing a longitudinal section through one of the baskets. Fig. 4^a is another detail. Fig. 5 shows a modification suitable for use in a continuous detinning operation, partly in vertical section and partly in side elevation. Fig. 6 shows a horizontal section on the line X X, Fig. 5.

Referring more particularly to the drawings, Figs. 1 to 4^a, A is a tank or vat of non-conducting material provided with conductors B B' on the tops of its two sides. The tanks or vats may be of conducting material insulated from the conductors, and thus neutral, or may be connected to the negative conductor, and thus form part of the cathode without departing from the spirit or scope of this invention. The conductors B B' are connected to the terminals of a continuous-current dynamo C.

D-D are baskets, preferably of iron, which

are coated with an enameling material E. I have found that a vitreous enamel is a suitable enamel for this purpose. These baskets are entirely coated on the outside and are coated on the inside, together with their supports F, so far as the same are immersed in the electrolyte, with the exception of the innermost edges F'. These edges serve to make electrical contact with the tin-scrap contained in the baskets, which is thereby brought into electrical connection with the positive pole of the source of energy. The supports F rest on one side upon the strip B, connected with the positive pole, and are supported at the other side by a block of insulating material F².

The two external electrodes G G are similar in construction, and the central electrodes may also be of the same construction, if desired. I may make the central electrode H of corrugated iron, since it is less expensive to manufacture it in this form, and yet provides the necessary extended surface. The electrodes G G are constructed of iron bars having small thickness and considerable depth, which are fastened together in any suitable manner by a conducting head-piece G'. This conducting head-piece extends outward in both directions, so that on one side it is supported by the conducting-bar B', connected to the negative pole of the source of current, while on the other side it is supported by a block of insulating material G². The electrode H is also provided with an extended head-piece, of conducting material, and rests at one end upon the conductor B', while its other end is supported by a block of insulating material.

In the modified form of apparatus shown in Figs. 5 and 6 I is a stationary basket, preferably having its sides I' made of sheet metal and its ends I² made of cast metal. A conveyer runs through the basket and consists of bars K, carried by chains L, which chains run in grooves I³ in the ends I² of the basket. The conveyer-chains pass over wheels M at the bottom of the basket, these features being the same as disclosed in my pending application, Serial No. 301,585, filed February 17, 1906. The outside of the basket, together with the wheels M, is covered with the insulating enamel E, above referred to. I also coat the inner surface of the sides I' with insulating enamel E, but leave uncoated the inner surface of the ends I², so that the scrap coming into this basket may come into electrical contact with the inner surfaces of the ends, and thereby be connected to the positive pole of the source of current, the metallic base of the basket itself being connected to that pole. I preferably leave unenameled the chains and the cross-bars of the conveyer, since they are intimately associated with the tin-scrap and serve to assist in making electrical contact therewith, and yet are in relatively disadvan-

tageous positions for entering into competition with or diverting the current from the tin-scrap.

Between the two legs of the basket I place a corrugated electrode N, and on each side of the basket I place two comb-formed electrodes N', all of which are connected to a conductor or bus-bar leading from the negative terminal of the source of current.

By the use of the enameled baskets with exposed contact-surfaces above referred to, the action of the current is confined to the tin-scrap, and the amperes necessary to perform a given amount of work are very greatly reduced, doing away with a separate contact member and getting the advantage of using the low resistance of the basket as a conductor and also a large contact-surface.

The enameling of the baskets permits the bringing of the cathodes into closer proximity to the baskets and the scrap contained therein and in connection with old baths having fixed dimensions of tub and basket permits the substitution of corrugated or comb cathodes for the old flat cathodes, since the corrugated or comb form is necessarily thicker than the usual form of flat cathode and when substituted come closer to the baskets.

What I claim is—

1. In an electrolytic detinning-bath the combination of a containing vessel adapted to contain an electrolyte, a receptacle for tin-scrap having a metallic base provided with an insulating coating exposed to the electrolyte, and also an exposed metallic surface for making contact with its contents a cathode and a source of continuous current having its positive pole electrically connected to said base and its negative pole to the cathode.

2. In an electrolytic detinning-bath the combination of a containing vessel adapted to contain an electrolyte, a receptacle for tin-scrap consisting of a metallic base having an exterior surface covered with an insulating-coating and having its interior surface partially covered with an insulating-coating, a cathode and a source of continuous current having its positive pole electrically connected to the base of said basket and its negative pole electrically connected to the cathode.

3. In an electrolytic detinning-bath the combination of a containing vessel adapted to contain an electrolyte, a receptacle for tin-scrap having a metallic base provided with an insulating-coating exposed to the electrolyte and also an exposed metallic surface for making contact with its contents; a metallic cathode having a plurality of oppositely-disposed surfaces and a source of continuous current having its positive pole electrically connected to the base of said basket and its negative pole to the cathode.

4. In an electrolytic detinning-bath the combination of a containing vessel adapted

to contain an electrolyte, a receptacle for tin-
scrap having a metallic base provided with an
insulating-coating exposed to the electrolyte,
and also an exposed metallic surface for mak-
5 ing contact with its contents, a cathode having
numerous opposed surfaces of small dimen-
sions and a source of continuous current hav-
ing its positive pole electrically connected to
the base of said basket and its negative pole
to the cathode.

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