

J. C. LINCOLN.
ELECTROMAGNETIC APPARATUS.
APPLICATION FILED OCT. 10, 1910.

1,063,170.

Patented May 27, 1913.

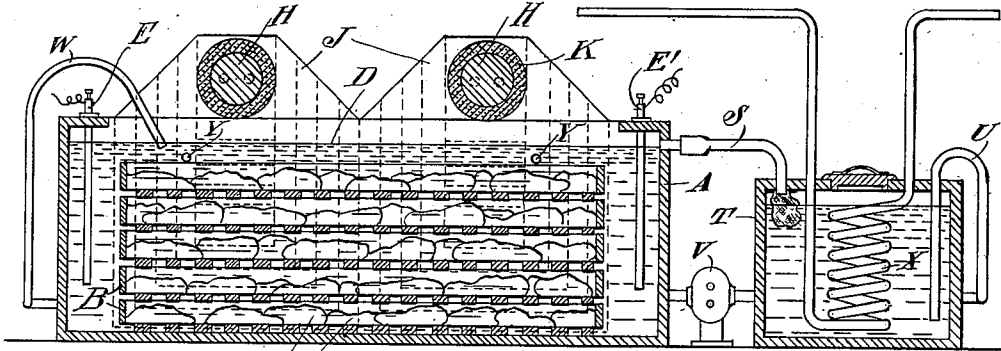


FIG. 1

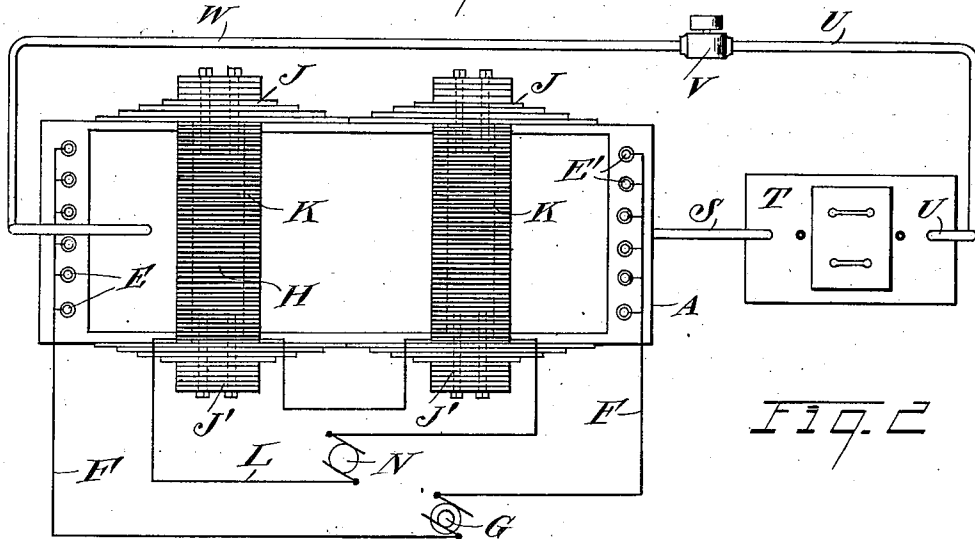


FIG. 2

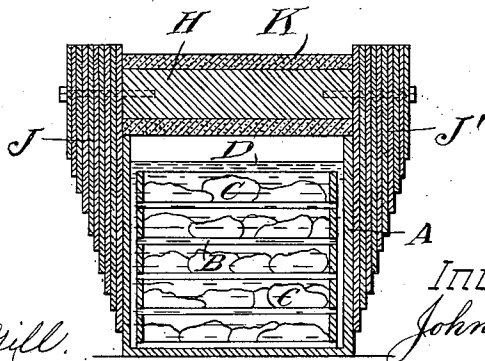


FIG. 3

Witnesses:

Hugh B. McGill.

Brennan B. West.

Inventor.

John C. Lincoln.

By

Albert H. Bates,
Attys.

UNITED STATES PATENT OFFICE.

JOHN C. LINCOLN, OF EAST CLEVELAND, OHIO, ASSIGNOR TO THE ELECTRIC MEAT CURING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF MAINE.

ELECTROMAGNETIC APPARATUS.

1,063,170.

Specification of Letters Patent.

Patented May 27, 1913.

Original application filed September 27, 1909, Serial No. 519,675. Divided and this application filed October 10, 1910. Serial No. 586,271.

To all whom it may concern:

Be it known that I, JOHN C. LINCOLN, a citizen of the United States, residing at East Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Electromagnetic Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My prior application No. 519,675, filed September 27th, 1909, of which this is a division, describes and claims the process of curing meat wherein such meat and a surrounding liquid curing medium is subjected to an electric current while being held in a magnetic field. I have found that such a process of curing reduces, to a remarkable degree, the time required. I believe this to be due to the deflection or lateral pressure of the filaments of curing medium constituting paths of current on the principle that an electric conductor carrying a current in a magnetic field tends to move, and, I believe, this deflection or pressure carries the salt in the solution more effectively into the pores of the meat.

The present invention is for an apparatus for carrying out the process described.

The apparatus comprises a tank with electrodes therein, whereby a current may be passed through the tank contents, and one or more magnets having pole faces so arranged that the tank contents are maintained in a magnetic field.

Other features of the apparatus, which render it efficient in operation, are hereinafter explained and set out in the claims.

The drawings clearly illustrate my invention.

Figure 1 is a longitudinal vertical section through the apparatus; Fig. 2 is a plan, and Fig. 3 a vertical cross section.

Referring to the illustration in the drawings, A represents a suitable tank, B racks which may be placed therein and are adapted to contain the articles to be cured, as for example, pieces of meat C. This meat is maintained by the racks separated in regular parallel horizontal layers so that the brine, indicated by D, has a perfect access to each piece.

E and E' represent the electrodes which may be carbon pencils, those of one end being all connected in multiple and those at

the other in multiple, and the two sets constituting the terminals of a circuit conductor indicated by F, which has a source of current, preferably alternating current, indicated by the generator G.

Extending across the top of the tank, in the illustration given, are two electromagnets. Each of these magnets has a core H and a pair of pole pieces J and J' extending down on the opposite sides of the tank and a winding conductor K, which is adapted to be in a closed circuit, by reason of the conductors L with the generator N, preferably of direct current. The pole pieces extend for a considerable distance on the sides of the tank and are reduced in thickness as they recede from the core so as to preserve the magnetic density approximately uniform throughout the space between the poles. By having a plurality of these magnets arranged side by side with their pole pieces substantially covering the sides of the tank, I am enabled to obtain a magnetic density approximately uniform throughout the tank.

In order to bring fresh brine constantly to the meat so that the salt will be immediately at hand for rapid penetration of each piece, I circulate the brine through the tank. The circulation system is illustrated in the drawing by the pipe S leading from the tank to an outside tank T, the pipe U leading from this outside tank to a pump V and the pipe W leading from the pump back to the tank. The pipe S is of rubber or other insulation, to prevent short circuiting of current. If desired, the brine may be cooled by having in the outside tank a coil X of pipe carrying cooling medium from a suitable cooling system.

The trays are removable for convenient installation. They are held down by suitable means, as the pegs Y. The magnets are also preferably removable, which enables one set of magnets to operate with several tanks, whereby one tank may be in the process of being packed while another is being treated.

As above stated, the generator G, which supplies current to the electrodes, is preferably an alternating current generator. The use of alternating current has the advantage that chlorine gas is not developed from electrolysis. Furthermore, it causes the electro-

magnetic deflections of the medium constituting the current paths to be first in one direction and then in the other, whereby a more even curing is obtained.

- 5 While I have shown the apparatus as adapted particularly for the curing of meat, its use is not limited thereto. The effect, which the apparatus has, of electro-magnetically forcing up or down the liquid medium
10 which carries the current, may be availed of, for example, for separating conductive material from non-conductive. Thus, if the deflection of the liquid member is downward, the apparent specific gravity of the liquid is increased, and substances not partaking of
15 the conducting path, that is non-conductors, may be caused to float to the surface. Accordingly, I do not intend to limit myself, in this application, to the use of the apparatus
20 solely for preserving. The particular embodiment of the apparatus shown may be used for the separating operation mentioned, though in that case it will usually be found desirable to remove the trays.
- 25 Having thus described my invention, what I claim is:—

1. An apparatus comprising a vessel adapted to contain liquid, means for circulating liquid through the vessel, electrodes
30 therein, and a magnet having pole faces outside of the vessel and adapted to cause lines of force transversely of the vessel contents, and means for passing alternating current between the electrodes.

35 2. An apparatus comprising the combination of a vessel, electrodes therein at the opposite ends of the vessel, and a magnet having pole faces on opposite sides of the vessel, and means for supplying electric current to the electrodes, one electric current
40 to the electrodes and another electric current to the magnet, one of such currents being varied.

45 3. An apparatus consisting of a vessel adapted to contain a liquid, and having an open top for the insertion of articles, means for passing an electric current through the liquid, an electromagnet having pole faces on opposite sides of the vessel, and means
50 for supplying current to the magnet, one of such currents being varied with reference to the other.

55 4. In an apparatus of the character described, the combination of a tank, an electromagnet having pole faces on opposite sides of the tank, said pole faces being of diminishing thickness as they recede from the core, and means for passing current through the tank transversely of the lines
60 of force of the magnet, and means for passing current through the magnet, one of such currents being alternating and the other direct.

65 5. An apparatus for preserving, consisting of a vessel adapted to contain the arti-

cles to be preserved surrounded by a preserving medium, means for passing an electric current through the same, and an electromagnet having pole faces on opposite sides of the vessel, and means for supplying
70 current to the magnet, one of such currents being varied with reference to the other.

75 6. An apparatus for preserving, consisting of a vessel adapted to contain the articles to be preserved and a preserving medium, electrodes in the vessel, and a magnet having pole faces on opposite sides of the vessel, means for supplying electric current to the electrodes and electric current
80 to the magnet, one of such currents being varied with reference to the other.

85 7. In an apparatus for preserving, the combination of a tank, an electromagnet having pole faces on opposite sides of the tank, means for passing alternating electric current through the tank at substantially right angles to the lines of force of the magnet, and means for holding the articles to be preserved in separate layers in the preserving medium in the tank.
90

95 8. The combination of a tank, a pump and piping for circulating fluid through such tank, electrodes in the tank, one or more magnets having their cores extending across the tank and their pole pieces on opposite sides of the tank, and means for supplying current to the electrodes and to the magnet or magnets, one of such current
100 being alternated.

105 9. The combination of a tank, frames or trays adapted to be contained therein and hold pieces of meat in separated horizontal layers, a pump and piping for circulating fluid through such tank, electrodes in the tank, means for supplying alternating current thereto, one or more magnets having their cores extending across the tank and having pole pieces on opposite sides of the tank, said pole pieces diminishing in thickness as they recede from the cores, and
110 means for supplying direct current to the magnet or magnets.

115 10. In an apparatus of the character described, the combination of a horizontal tank adapted to have an open top through which articles may be inserted, electrodes within the tank at its opposite ends, and a magnet having pole faces on opposite sides of the tank, means for supplying electric current
120 to the electrodes, means for supplying electric current to the magnet, one of such currents being varied with reference to the other.

125 11. In an apparatus of the class described, the combination of a tank, electrodes within the tank at the opposite ends thereof, an electromagnet having pole faces on opposite sides of the vessel opposite the space between the electrodes, the tank having an
130

opening for the insertion of articles between the electrodes, means for supplying electric current to the electrodes, means for supplying electric current to the magnet, one of such currents being varied with reference to the other.

12. In an apparatus of the character described, the combination of a tank adapted to contain liquid, trays within the tank, electrodes within the tank at the opposite ends of the trays, and a magnet having pole faces on opposite sides of the tank, means for supplying electric current to the electrodes, means for supplying electric current to the magnet, one of such currents being varied with reference to the other.

13. In an apparatus of the class described, the combination of a rectangular tank having an open top, rectangular trays adapted to be inserted through such open top into the tank, electrodes within the tank opposite the ends of the trays, an electro-magnet having its core extending cross wise of the tank and having pole faces on opposite sides of the tank, and means for supplying current to the electrodes and to the magnet, one of such currents being alternating and the other direct.

14. In an apparatus of the class described, the combination of a vessel adapted to contain liquid, electrodes therein, a magnet having pole faces on opposite sides of the vessel, means for supplying direct current to the magnet, and means for supplying alternating current to the electrodes.

15. In an apparatus of the class described, the combination of a tank adapted to contain liquid, electrodes near the opposite ends thereof, means for supplying current to the

electrodes, a plurality of electro-magnets having cores extending cross wise of the tank and having spreading pole faces adapted to substantially cover the sides of the tank opposite the liquid between the electrodes, and means for supplying current to the electro-magnets, one of such currents being alternating and the other direct.

16. In an apparatus of the class described, the combination of a tank, a series of surmounting trays within the tank, the tank having an opening through its top large enough for the removal of the trays, electrodes in the tank at the opposite ends of the trays, an electro-magnet having its core extending cross wise of the tank and having pole faces on opposite sides of the tank, means for supplying direct current to the magnets and alternating current to the electrodes, and means for circulating liquid contained in the tank and surrounding articles on the trays.

17. In an apparatus of the class described, the combination of a vessel adapted to contain liquid, electrodes adjacent to the opposite ends of the vessel, trays adapted to contain articles to be preserved between the electrodes, and an electro-magnet having pole faces on opposite sides of the trays, means for supplying electric current to the electrodes, means for supplying electric current to the magnet, one of such currents being varied with reference to the other.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

JOHN C. LINCOLN.

Witnesses:

ALBERT H. BATES,
BRENNAN B. WEST.