No. 674,934. Patented May 28, 1901.

M. MAURAN.

ELECTRODE FOR ELECTROLYTIC CELLS.

(Application filed Mar. 16, 1900. Renewed Apr. 27, 1901.)

(No Model.) 2 Sheets—Sheet 1.

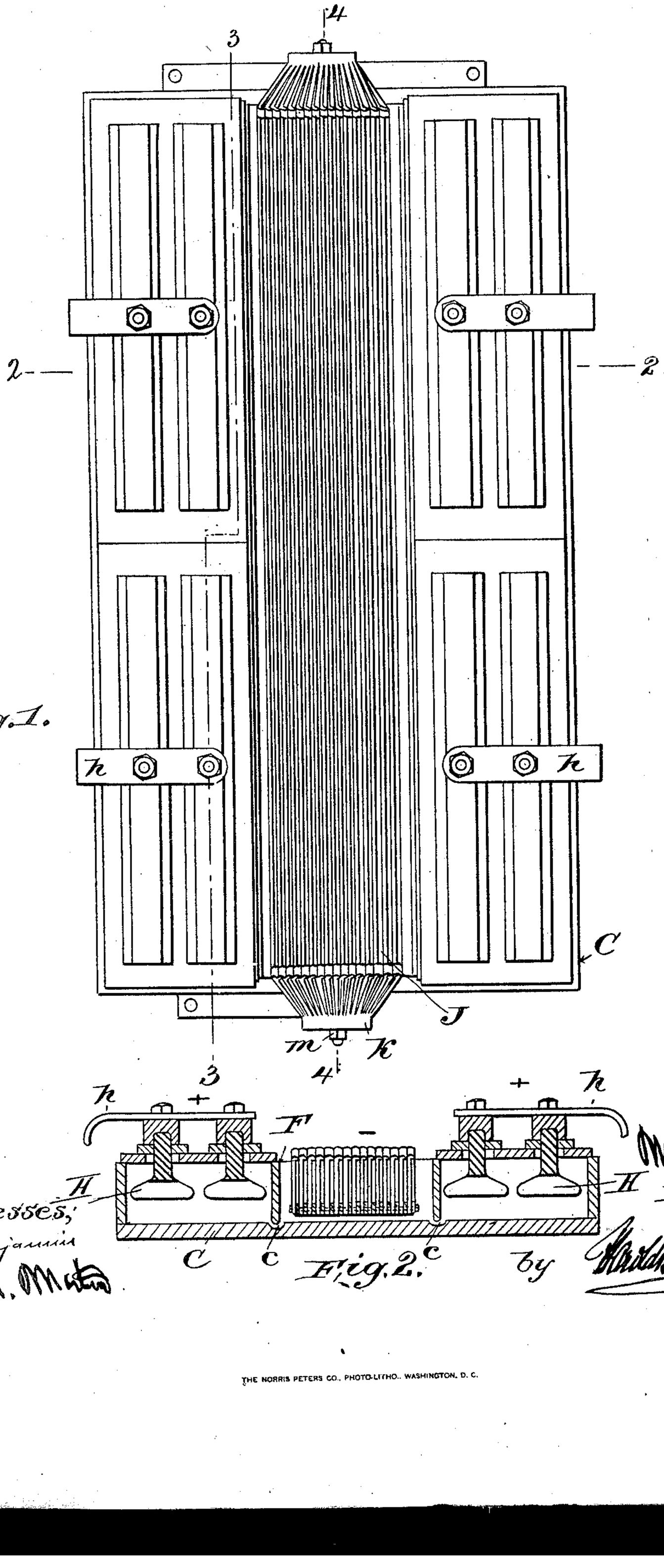

Fig. 1.

Fig. 2.

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Fig. 3.

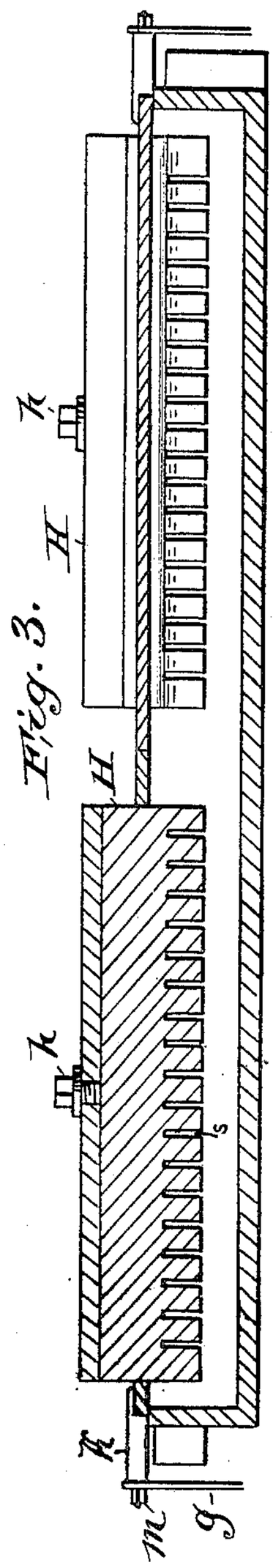


Fig. 4.

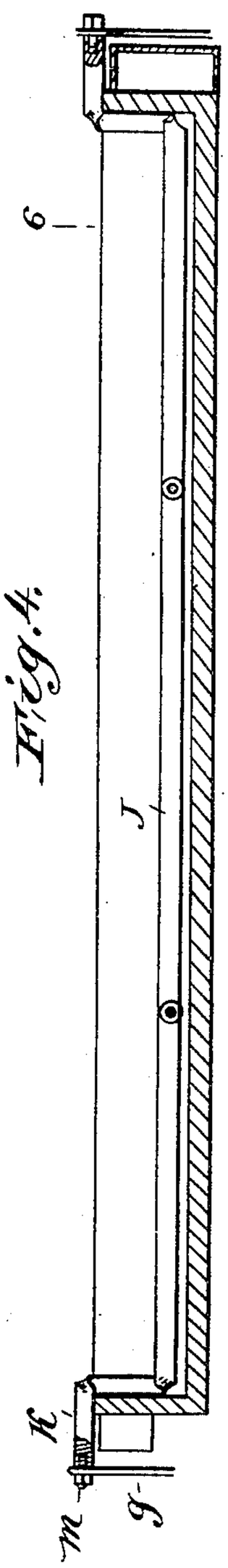


Fig. 6.

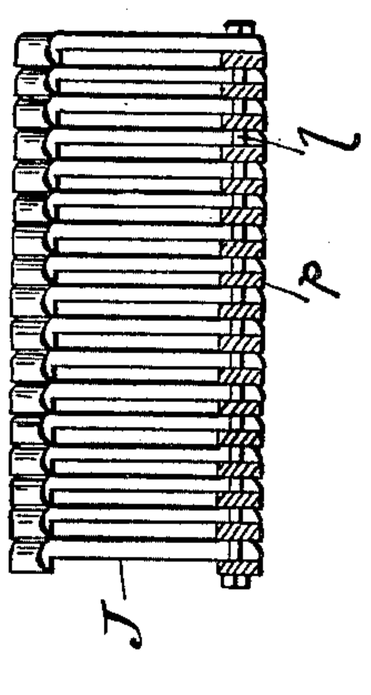


Fig. 8.

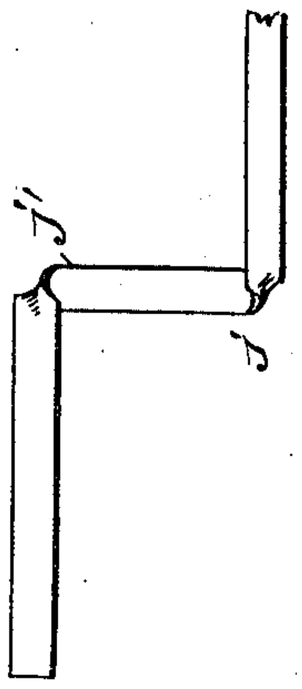


Fig. 7.

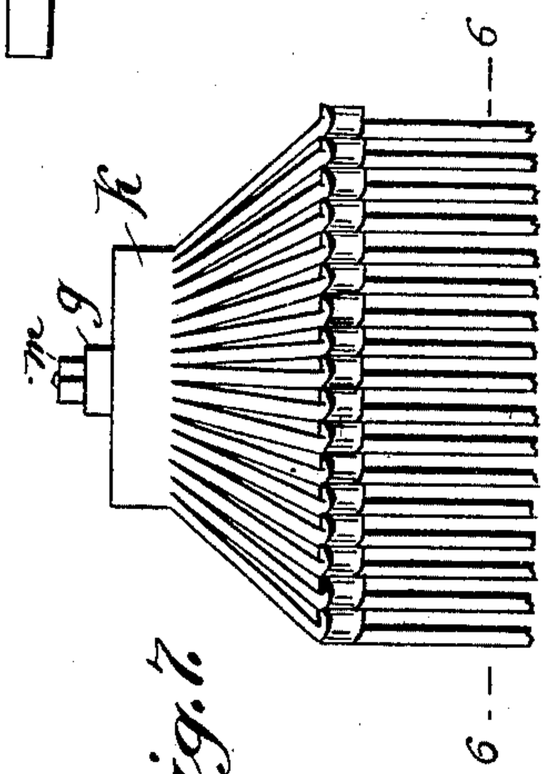
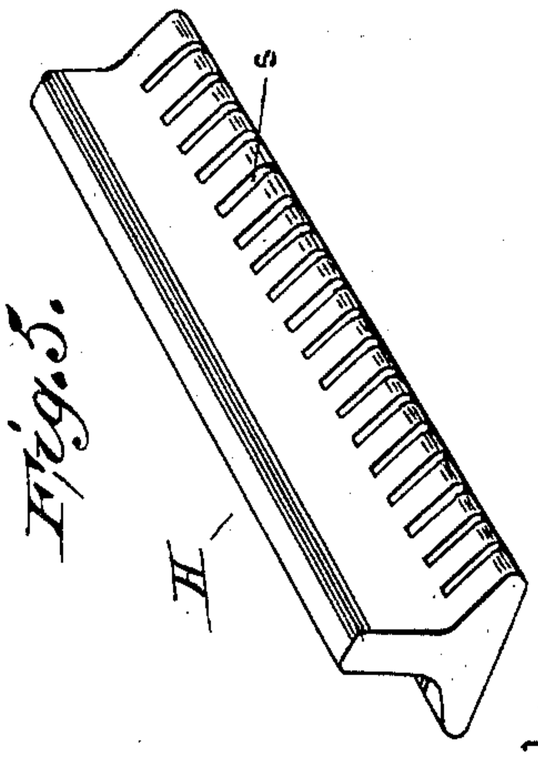


Fig. 5.



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UNITED STATES PATENT OFFICE.

MAX MAURAN, OF NIAGARA FALLS, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO CASTNER ELECTROLYTIC ALKALI COMPANY, OF VIRGINIA.

ELECTRODE FOR ELECTROLYTIC CELLS.

SPECIFICATION forming part of Letters Patent No. 674,934, dated May 28, 1901.

Application filed March 16, 1900. Renewed April 27, 1901. Serial No. 57,806. (No model.)

To all whom it may concern:

Be it known that I, MAX MAURAN, mechanical engineer, a citizen of the United States, with residence and address at Niagara Falls, State of New York, have invented new and useful Improvements in Electrodes for Electrolytic Cells, (Case No. 2,) as set forth in the following specification with drawings.

The invention is especially related to cells designed for the electrolytic decomposition of common salt—for example, the type of cells shown in United States Letters Patent to Castner Nos. 518,135 and 528,322, and in my copending application, filed March 26, 1900, Serial No. 10,220. It is not, however, limited to such a cell. It concerns, primarily, the electrodes.

The objects of the invention are to improve the cathodes for electrolytic cells and increase both their life and their effectiveness. The anodes are preferably of carbon of inverted-T section, but so slotted or perforated as to allow the ready escape of chlorin or other gas as it forms at said electrode. The novel features of these anodes are claimed in a divisional application, Serial No. 20,264, filed June 14, 1900. The improved cathodes are so designed that a minimum of resistance is afforded and the union between the cathode-bars and the terminal connection is out of and above the electrolyte.

Other advantages and objects will be apparent from the following detailed description of the invention in one of its desirable forms, as shown in the drawings.

In the drawings, Figure 1 is a plan view of a cell provided with the improved electrodes. Fig. 2 is a sectional view on the plane 2 2 of Fig. 1. Figs. 3 and 4 are sectional views on the planes 3 3 and 4 4 of Fig. 1, respectively. Fig. 5 is a perspective of one of the anodes. Fig. 6 is a sectional view of one of the cathodes on the plane 6 6 of Figs. 4 and 7. Fig. 7 is a plan of one end of a cathode, and Fig. 8 is a detail of one of the cathode-bars.

Throughout the figures like reference-letters refer to like parts.

The cell C and its manner of support need not be described in detail, as it is not claimed as new herein. The longitudinal partitions F of the cell divide it into three compartments and are sealed in the mercury in the bottom of the cell, as is well understood in connection with the Castner cell.

The anodes H H are shown supported in the covers *d* and connected with the positive bars *h*. The cathodes J are shown in the central compartment, the cover of which is omitted from the drawings.

The form of the improved anodes H H is shown clearly in Figs. 2, 3, and 5. They are of inverted-T section and are supported from above by the shank of the T. The lower flanges are slitted or channeled, as shown at *s*.

The improved cathode J (shown in the central compartment of Figs. 1 and 2 and in detail in Figs. 4, 6, 7, and 8) may be supported by its ends or may rest on blocks or other supports on the bottom of the cell. All but its terminal portions are immersed in the bath, and it is directly connected in circuit by the connecting-bars *g*. It is made up of parallel strips or flat bars, preferably of rolled iron, held apart at intervals, if desired, by bolts *l* and interposed washers *p*. In Figs. 6, 7, and 8 the peculiar construction is best shown. Each individual bar or strip of the cathode is folded near each end on a diagonal line, so as to make a bend at ninety degrees, as clearly indicated at *j* in Fig. 8, and again after extending upward a sufficient distance to reach the top of the cell it makes a similar bend *j'* at right angles and is carried outward in a horizontal plane parallel with the main body of the grid, but converging to bring the ends together beyond the cell-wall, so that the extreme ends of several bars may be directly welded together in the fan-like formations *k*, as shown. In making these cathodes the extreme ends are heated to a welding heat and all firmly welded together into one homogeneous mass, as shown at *k*. These solid ends *k* are then tapped to receive binding-posts or machine-screws *m*, which connect them to the negative bars *g*. Thus the individual bars making up the integral grid are carried without any break or joint upward and outward

from the bath and united outside of the bath and cell at each end. The weld being entirely external to the bath is not subjected to corrosive action of the contents of the cell. In addition to these obvious advantages it will be seen that as the flow of the current is lengthwise of each bar throughout, and therefore in line with the rolled fiber of the iron composing the bar, the conductivity of the bar is utilized in its maximum direction. At the point where the several sections of the grid converge and unite the cross-section presented to the current in passing from bar to bar at the weld is very large and only a negligible resistance is there offered.

Having now set forth the novel features of the present invention and without enumeration of the obvious and many slight modifications that may be made in matters of detail, I claim and point out as the characteristic features of the invention the following:

1. An electrode, composed of a plurality of strips or bars, each bent upon itself to extend out of the bath or the cell, and all having their ends welded together, substantially for the purposes set forth.

2. An electrode, composed of strips or bars, each bent upon itself on a diagonal line near its end to form an upward bend, and then bent outward in like manner, and the ends being welded together, substantially as and for the purposes set forth.

3. An electrode consisting of a plurality of relatively long and narrow conductors, the fiber of which extends parallel with their length, the ends being homogeneously united, substantially as and for the purposes set forth.

4. An electrode bar or member of metal having its fiber longitudinal, said bar being twice folded flatly upon itself for the purposes set forth.

Signed this 6th day of March at the city of Niagara Falls, New York.

MAX MAURAN.

Witnesses:
E. F. SCHUYLER,
H. A. SMITH.