C. A. PARKS.

ELECTROLYTIC APPARATUS.

APPLICATION FILED SEPT. 14, 1914.

1,131,859.

Patented Mar. 16, 1915.

2 SHEETS—SHEET 1.

Fig. 1

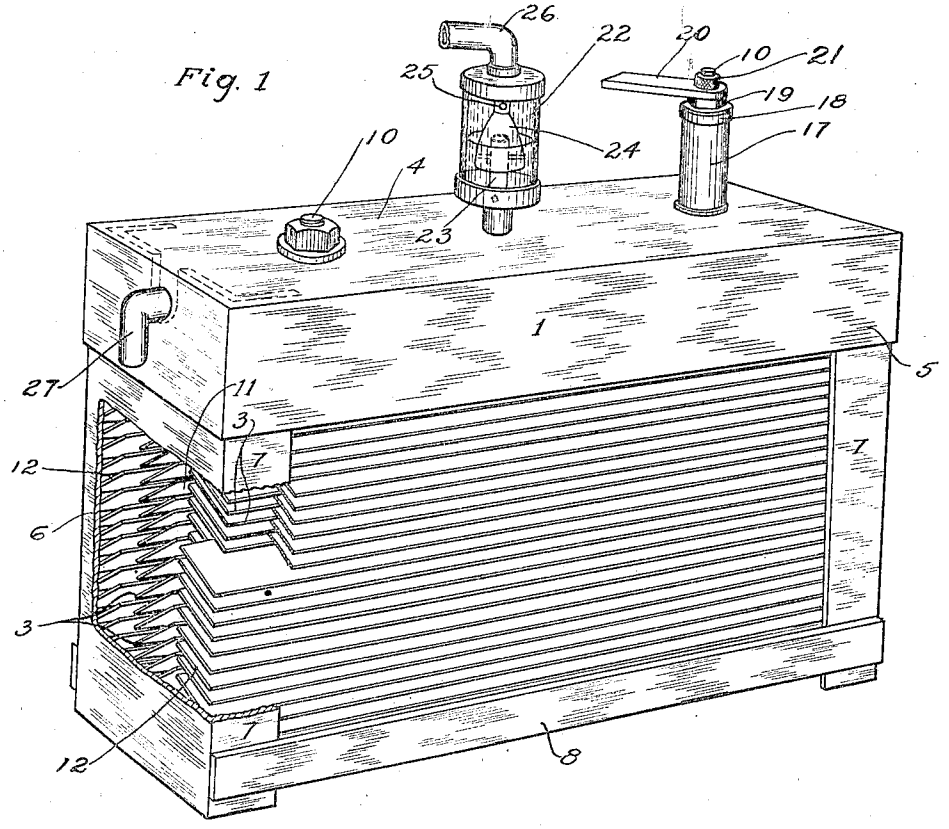


Fig. 2

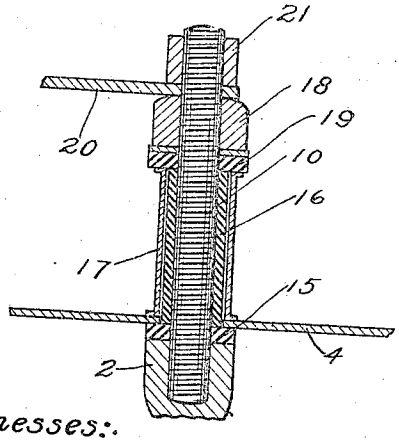
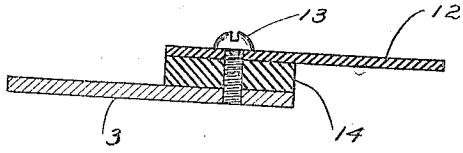


Fig. 3



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2 SHEETS—SHEET 2.

Fig. 4

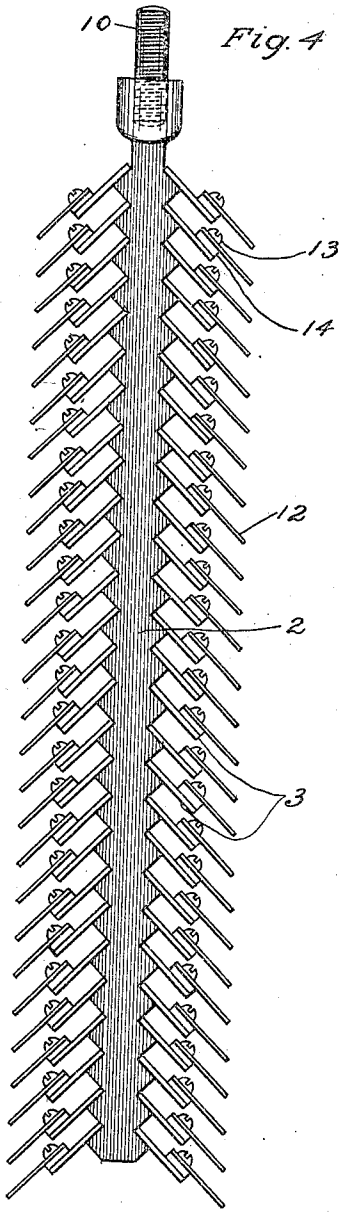


Fig. 5

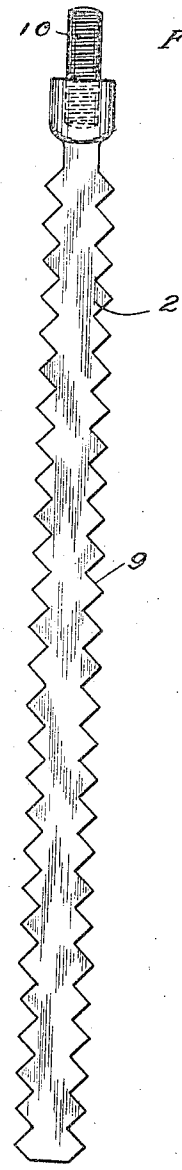
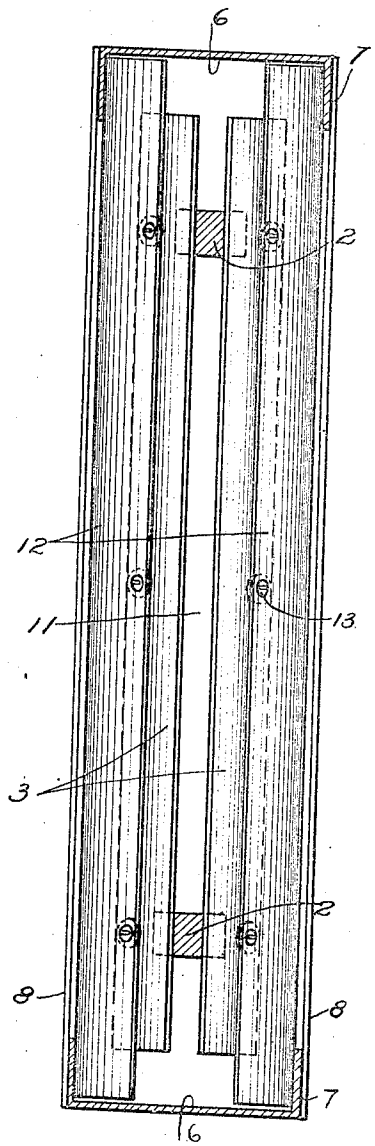


Fig. 6



Witnesses:

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UNITED STATES PATENT OFFICE.

CLIFTON A. PARKS, OF CHICAGO, ILLINOIS.

ELECTROLYTIC APPARATUS.

1,131,859. Specification of Letters Patent. Patented Mar. 16, 1915.

Application filed September 14, 1914. Serial No. 861,683.

To all whom it may concern:

Be it known that I, CLIFTON A. PARKS, a citizen of the United States of America, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Electrolytic Apparatus, of which the following is a specification.

The main objects of this invention are to provide an improved form of electrolytic apparatus suitable for use in decomposing products by electricity; to provide an improved apparatus of this kind particularly adapted for use in the commercial production of hydrogen and oxygen by the decomposition of water; and to provide an improved construction and arrangement of the electrodes so as to facilitate the decomposition of the electrolyte and the collection of the products which are liberated thereby.

An illustrative embodiment of this invention is shown in the accompanying drawing in which—

Figure 1 is a perspective view of the improved electrolytic apparatus, a part thereof being broken away and shown in section so as to more clearly illustrate the construction thereof. Fig. 2 is an enlarged sectional detail of the terminal binding post. Fig. 3 is an enlarged transverse sectional detail of one of the conductor plates and baffle plates attached. Fig. 4 is an enlarged end view of the electrode proper removed from the casing. Fig. 5 is a detail view in elevation of one of the supports, for the electrode plates. Fig. 6 is a plan view partly sectional of the complete electrode with the bell or top of the casing removed.

In the construction shown in the drawings, the apparatus comprises a casing or housing 1, within which are suspended the terminal posts 2, to which the conductor plates 3, of the electrode, are attached.

The casing is made up of a bell 4, having depending flanges 5 extending around the edges thereof, and end members 6 having inwardly disposed flanges 7 along the vertical edges thereof and forming channel members. The end members 6 are secured together at their lower ends by bars 8 and have their upper ends received within the flanges of the bell 4. The casing parts are preferably metal stampings and their arrangement as shown in Fig. 1 provides open sides and bottom through which the electrode proper is exposed.

The terminal posts or supports 2 are preferably of rectangular cross-section and have the opposite sides thereof notched, as shown in Fig. 5, so as to provide inclined shoulders 9, to which the conductor plates 3 are attached. The supports 2 are provided with extensions or studs 10 which extend through the bell or top 4 and have suitable nuts applied thereto for rigidly supporting the posts in place.

The conductor plates 3 are preferably wrought iron and are secured to the shoulders 9 on the posts 2 preferably by welding, the plates on each side being arranged in substantially parallel relation and spaced apart the thickness of the supports 2 so as to provide a vertically disposed open space 11 (Fig. 6) between the inner edges of the plates. Insulating baffle plates 12 preferably made of hard rubber, are secured to the plates 3 so as to extend beyond the sides and ends thereof, as shown in Figs. 4 and 6. The baffle plates 12 are secured to the respective conductor plates 3 at intervals along their length by means of screws 13, with spacing blocks 14 located between the plates so as to space the conductor plates and the baffle plates apart and allow gases arising from the top of the plates 3 to be deflected in to the space 11. The angularity and spacing of the plates 3 are such that the screws 13 are conveniently accessible for attaching or removing the baffle plates 12. Since the baffle plates 12 extend beyond the ends and sides of the conductor plates, they engage the end members 6 and support the electrode proper centrally in the casing out of contact with all parts thereof.

The post 2, to which the source of electricity is connected, has the stud 10 extending a considerable distance above the top of bell 4, as shown in Fig. 2, and is electrically insulated from the bell by means of a gasket or insulating washer 15 and an insulating tube 16, embracing the stud and incased within a tube or shell 17 welded on the top 4. A nut 18 bearing on an insulating washer 19, firmly secures the post 2 in place. A bus bar or terminal member 20 is attached to the stud 10 and secured against dislodgment by means of a knurled nut 21.

A pipe 26 is provided for drawing off the gases as they accumulate in the bell 4 and directing them into a reservoir (not shown). This pipe is provided with a suitable trap herein shown to be in the form of a glass

cylinder 22 secured to the bell 4 and having a pipe 23 extending up from below the bell into the interior of the cylinder above the water level. A bell 24, suspended from the top of the cylinder 22, extends below the water level in the cylinder so as to provide a water seal. The support for the bell 24 is the pipe 26, which is closed at its lower end and provided with apertures 25, through which the gases enter the pipe 26 after passing through the liquid in the trap.

A pipe or elbow 27 is supported on one of the end flanges 5 of the bell 4 (as shown in Fig. 1) and communicates with the interior of the bell. This pipe has its outlet a short distance above the lower edges of the flanges 5 and in case the gas is liberated faster than it is taken away, the overflow will occur through the outlet of the pipe 27 instead of bubbling out around the edges of the flanges 5.

When the apparatus herein shown is used, a plurality of devices as shown in Fig. 1 are arranged closely together side by side with their open sides opposed, and immersed in a tank containing the electrolyte, such as distilled water, rendered slightly acid or alkaline to increase its conductivity. Alternate electrodes are respectively connected to the positive and negative terminals of the source of electricity. When the electrodes are charged, the current passes through the electrolyte from the plates 3 on one electrode to the plates 3 on the adjacent electrode. As is well known, the electrolyte is thereby decomposed into its elements, hydrogen being liberated at the negative plates and oxygen at the positive plates. As the bubbles of gases are liberated, they travel up the inclined parts of the plates 3 and 12 into the open space 11 and rise to the top of the casing 1 and into the pipes 23 from which they are conveyed to the storage reservoir. This arrangement of the conductor plates of the electrode also promotes the circulation of electrolyte, since the latter is carried along by the gases rising between plates of electrodes, and thus maintains uniformity of density of electrolyte and prevents the deposit on the plates of acid or alkaline salts present in the electrolyte.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims,

I claim:—

1. An electrode, comprising a support, a plurality of conductor plates attached to said support one above another and inclined upwardly, and baffle plates of insulating material attached to said conductor plates and extending beyond the edges thereof.

2. An electrode comprising a support, a plurality of conductor plates attached to said support one above another and inclined upwardly, and baffle plates of insulating material attached to said conductor plates so as to overlap the same and extend beyond the edges thereof.

3. An electrode, comprising a support, a plurality of conductor plates attached to said support one above another and inclined upwardly, and baffle plates of insulating material attached to said conductor plates and extending beyond the edges thereof, said baffle plates overlapping said conductor plates and being spaced away therefrom.

4. An electrode comprising a support, a plurality of plates attached to said support one above another and inclined upwardly, channel members embracing the ends of said plates, and a gas collecting bell located over the top of said plates and resting on said channel members.

5. An electrode comprising a support, a plurality of conductor plates attached to said support one above another and inclined upwardly, baffle plates of insulating material attached to said conductor plates and extending beyond the edges thereof, channel members embracing the ends of said conductor plates and being spaced away from the ends and sides thereof by said baffle plates, and a gas collecting bell located over the top of said plates and resting on said channel members.

6. An electrode comprising a pair of vertically disposed supports, a plurality of conductor plates extending from one to the other of said supports and attached thereto on opposite sides thereof, said plates being inclined inwardly and upwardly and providing a space between their inner edges, channel members embracing the ends of said plates, insulating means attached to said conductor plates and engaging said channel members so as to space said conductor plates away therefrom, a gas collecting bell located above said plates and resting on said channel members, and means connecting said supports to said bell.

7. In an electrolytic apparatus, the combination of a casing open at two sides, a terminal post suspended within said casing, conductor plates extending longitudinally of said casing and secured to said post at opposite sides thereof, said plates being arranged one above another and inclined inwardly and upwardly and providing a space between their inner edges.

8. In an electrolytic apparatus, the combination of a casing open at two sides, a terminal post suspended within said casing, conductor plates extending longitudinally of said casing and secured to said post at opposite sides thereof, said plates being arranged one above another and inclined in-

wardly and upwardly and providing a space between their inner edges, and insulating baffle plates secured to said conductor plates and extending beyond the edges and ends thereof and engaging said casing so as to support said conductor plates out of contact therewith.

Signed at Chicago this 12th day of September 1914.

CLIFTON A. PARKS.

Witnesses:
EUGENE A. RUMMLER,
M. IRENE HUTCHINGS.