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POT SHELL FOR FUSED BATH ELECTROLYSIS
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The present invention relates to a reduction cell con-
struction in which a novel deck plate mounting is pro-
vided to protect against loss of bath by overflows-
ning.

Electrolytic reduction cells or pots for the produc-
tion of aluminum conventionally employ a steel pot shell to
contain the cathode lining system. This is necessary be-
cause the lining materials commonly used have limited
strength by themselves, and they tend to absorb bath
constituents which cause expansion and distortion unless
the lining is adequately supported.

A flat deck plate has been provided along the inside
top edge of the steel pot to assist in containing the lining
materials and afford protection from physical abuse due
to normal pot operations. A serious problem encountered
with this construction is that leakage of the bath may
occur through the space between the deck plate and pot
shell. The present invention provides an effective solution
to this problem.

For a better understanding of the invention and its
various objects, advantages and details, reference is now
made to the presently preferred embodiment thereof
which is shown, for purposes of illustration only, in the
accompanying drawings. In the drawings:

FIG. 1 is a top plan view of a reduction cell embodying
the invention;
FIG. 2 is a section along line II—II of FIG. 1, show-
ing details of construction; and
FIG. 3 is a view similar to FIG. 2 showing a typical
prior art construction.

Referring more particularly to the cell construction
shown in FIGS. 1 and 2, it can be seen that the cell 10
includes a steel pot shell 12 suitably lined with interior
side wall lining material 14 which, together with an
interior bottom lining (not shown) serves to contain the
bath 16 of molten electrolyte. Vertical deck plate brackets
18 are mounted inside the pot shell at spaced intervals
to support a deck plate 20. Attachment of the deck plate
to each bracket 18 is made by connectors 22 and 24.
Connector 22 is threaded to receive a nut at one end, as
shown, and the opposite end is formed into a hook which
passes through a hole in the adjacent bracket. Connector
24 is a threaded stud welded to the bracket 18 and adapted
at the opposite end to receive a nut.

With reference to the prior art construction shown in

FIG. 3, the deck plate 28 has an inclined flange 30 and
the pot shell has an adjoining horizontal flange 32. Un-
der certain operating conditions a high bath level is cre-
ated. Once the bath contacts the deck plate 28, the
resulting sharp temperature increase in the metal of the
deck plate causes it to expand and buckle, thereby cre-
tag a gap through which the bath can escape. Once
started, the flow becomes difficult to stop before a lot of
bath escapes and considerable damage is done.

In contrast, the deck plate 20 in FIG. 2 is flat and a
flange 40 is provided at the top edge of pot shell 12.
Flange 40 projects above the deck plate 20 and serves
as a bath lip to prevent leakage outwardly of the cell.
The bath still can flow on and under the deck plate (this
being virtually impossible to stop altogether), but it can-
not spill out. After a short time the molten bath freezes
solid, and the loss of bath and resulting damage are
thereby prevented.

While the presently preferred embodiment of this in-
vention has been illustrated and described, it will be ap-
parent that the invention may be otherwise variously em-
body and practiced within the scope of the following
claims.

What is claimed is:
1. An electrolytic cell for the production of aluminum,
comprising a pot shell and interior lining to contain the
molten bath, a plurality of support brackets spaced along
the length of the cell inside said pot shell, a horizontal
deck plate supported by said brackets, said pot shell hav-
ing an angular flange extending upwardly and outwardly
at the top thereof, to provide a bath lip projecting
above the deck plate.

2. An electrolytic cell for the production of aluminum,
comprising a pot shell and interior lining to contain the
molten bath, a plurality of support brackets spaced along
the length of the cell inside said pot shell, a horizontal
deck plate supported by said brackets, said pot shell hav-
ing a vertical wall and an angular flange extending up-
wardly and outwardly from said wall at the top thereof,
the outer edge of said deck plate being disposed inwardly
of said shell adjacent the juncture between its
wall and flange, said flange providing a bath lip projecting
above the deck plate.

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JOHN H. MACK, Primary Examiner.

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