

UNITED STATES PATENT OFFICE

1,961,030

PROCESS FOR PROTECTING MAGNESIUM
AND ITS ALLOYS AGAINST CORROSION

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No Drawing. Application April 23, 1932, Serial
No. 607,217. In Great Britain May 19, 1931

2 Claims. (Cl. 148-6)

Our invention relates to the protection of mag-
nesium and its alloys against corrosion and has
for its object the better use of selenium and its
compounds than has heretofore been achieved for
this purpose. In accordance with our invention
we use an aqueous solution of selenious acid or
of a soluble selenite to treat the magnesium or
its alloys and obtain coatings containing
selenium in its elemental and/or combined forms.

Selenious acid solution gives the best results,
but a solution of a soluble selenite, generally so-
dium selenite containing selenious acid or a salt
or acid known to corrode magnesium, particu-
larly sodium chloride, gives excellent protection.

The following examples illustrate the inven-
tion:—

Example 1.—The metal to be protected is im-
mersed in an aqueous solution of selenious acid
10 per cent. strength at room temperature. The
time of immersion is from 5 seconds to 10 min-
utes according to the composition of the alloy;
when the alloy known as electron alloy AZM
(containing in 100 parts, Mg 92.5, Al 6.25, Zn 0.95,
and Mn 0.30) is under treatment, five minutes is
suitable. A small addition of sodium chloride to
the bath, such as 0.1–0.5 per cent., may improve
the coating.

Instead of immersing the metal in the solution,
the latter may be applied to the metal by a paint-
ing or spraying operation, for instance by rub-
bing the metal with cotton-wool soaked with the
solution.

Example 2.—To produce a comparatively thick
and porous coating suitable in cases where a coat
of paint is subsequently to be applied, the metal
is immersed in a bath of acidified aqueous sodium
selenite solution, for instance a solution of sodium
selenite of 6 per cent. strength to which has been
added 6 per cent. by volume of syrupy phosphoric

acid. This bath may be heated to 50° C.; the
time of immersion is 1–5 minutes.

Example 3.—The metal is immersed for 3 hours
in an 8 per cent. aqueous solution of sodium
selenite containing about 3.2 per cent. selenious
acid and 0.1 per cent. sodium chloride and heated
to about 80° C.–90° C.

The protective action of the selenium coating
may be improved if the coated metal is heated
to about 170°–225° C., for example in a muffle
furnace.

Special advantages of the invention are (1) that
the film is self-healing to a limited extent in the
presence of water, that is to say, if the film be-
comes slightly damaged it will re-form, at all
events partially, so that the metal remains pro-
tected to some extent, and (2) that the dimen-
sional change of the metal during the process
described in Example 1 is negligibly small.

The operation is rapid and simple.

The film forms an excellent basis for the ap-
plication of paints and greatly increases the pro-
tection they afford.

Having thus fully described the nature of the
said invention and the best means we know of
carrying the same into practical effect, what
we claim as our invention is:—

1. A process of protecting magnesium and its
alloys against corrosion which consists in treat-
ing the metal with an aqueous solution of seleni-
ous acid.

2. A process of protecting magnesium and its
alloys against corrosion which consists in treating
the metal with an aqueous solution of soluble
selenite containing a material selected from the
group consisting of phosphoric acid and selenious
acid.

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