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UNITED STATES PATENT OFFICE.

ARTHUR V. DAVIS, OF PITTSBURG, PENNSYLVANIA.

METHOD OF IMPROVING SURFACES OF ALUMINIUM.

SPECIFICATION forming part of Letters Patent No. 528,513, dated October 30, 1894.

Application filed January 24, 1894. Serial No. 497,912. (No specimens.)

To all whom it may concern:

Be it known that I, ARTHUR V. DAVIS, of
Pittsburg, in the county of Allegheny and
State of Pennsylvania, have invented a new
5 and useful Improvement in Methods of Im-
proving Surfaces of Aluminium, of which the
following is a full, clear, and exact descrip-
tion.

I have discovered that by treating the alu-
10 minum with a combination of hydrofluoric
acid and nitric acid, its surface appearance
can be greatly improved, and the dullness of
the metal removed so as to enhance its value
in the arts. Neither hydrofluoric acid alone
15 nor nitric acid alone will afford the desired
result satisfactorily, but by a mixture of
them, or by their conjoint and successive use,
excellent results are obtained.

To determine the proper proportions of
20 hydrofluoric acid of any given commercial
strength to be added to the concentrated ni-
tric acid of commerce in order to prepare a
desirable mixture for my purpose, I may pro-
ceed as follows:—Nitric acid of commerce
25 having specific gravity of about 31.4° Baumé
is preferably diluted with, say, about one to
twenty parts of water. The proportion of wa-
ter used is variable according to the temper-
ature of the mixture of acids ultimately em-
30 ployed for treating the aluminum, for when
the mixture is to be used hot a less propor-
tion of acid will answer, than when the mix-
ture is cold. A good working test of the pro-
portion of hydrofluoric acid to be added to the

nitric acid is to place in the dilute nitric acid 35
a piece of aluminum, and to add hydrofluoric
acid until gas is evolved freely from the sur-
face of the aluminum. Such evolution of
gas will indicate that the acids have been
combined properly. Having ascertained the 40
proper proportions (which are, of course, va-
riable because of the uncertain strength of
the hydrofluoric acid of commerce, and vari-
able also according to the temperature of the
mixture, for a hot solution of the acid may be 45
used when more dilute than a cold solution),
the aluminum to be treated is immersed
therein and is allowed to remain until its sur-
face becomes bright. It is then removed and
washed, preferably with hot water, and hav- 50
ing been dried by sawdust or otherwise, the
operation is complete.

I do not limit myself to the use of the acids
in any given proportion, nor do I disclaim the
addition of other materials or steps in the 55
practice of my process; but

What I claim is—

The method of improving the surface ap-
pearance of aluminum, which consists in
treating the surface with a mixture of hydro- 60
fluoric acid and nitric acid, substantially as
described.

In testimony whereof I have hereunto set
my hand.

ARTHUR V. DAVIS.

Witnesses:
EDGAR HEFFLEY,
W. B. CORWIN.

No references

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