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ELECTRIC CONTACT ELEMENT

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This invention relates to improvements in elec-
tric contact elements.

It is an object of the invention to provide a
contact which possesses superior physical prop-
erties such as high specific gravity and satisfac-
tory strength.

It is a further object of the invention to pro-
vide a contact of high melting point and high
recrystallization temperature.

Other objects of the invention will be apparent
from the following description, taken in connec-
tion with the appended claims.

The present invention comprises a combination
of elements, methods of manufacture and the
product thereof, brought out and exemplified in
the disclosure hereinafter set forth, the scope of
the invention being indicated in the appended
claims.

While a preferred embodiment of the invention
is described herein, it is contemplated that con-
siderable variation may be made in the method
of procedure and the combination of elements
without departing from the spirit of the inven-
tion.

According to the present invention, an im-
proved contact is contemplated, formed of an
alloy having the following ingredients present in
substantially the ranges of proportion given be-
low:

	Per cent
Uranium-----	.1 to 35
Refractory metal of the tungsten-mo- lybdenum group-----	Balance

Part of the refractory metal can be replaced
by rhenium. We have found that it is possible
to produce tungsten base materials containing
up to 35% of uranium, part of which is taken up
by tungsten in solid solution and part of which
exists as a free constituent, the bonded alloys
showing increased hardness and considerable re-
sistance to abrasion. Uranium is suitable as an
alloy element for tungsten because it has a melt-
ing point of 1700 to 1800 degrees C. Uranium
and tungsten can be sintered by heating to a
temperature above 1200 degrees C. in a non-oxi-
dizing atmosphere, such as in vacuum.

We have also found that such elements as car-
bon, boron, or silicon, may be added. Our ex-
periments have shown that uranium will form
compounds with these elements and when added
to our improved tungsten-uranium alloys double
compounds may be formed. We have found
that alloys of the following composition show
considerable advantages—

	Per cent	
A. Tungsten-----	99.50	
Uranium-----	.50	
B. Tungsten-----	95.00	
Uranium-----	5.00	5
C. Tungsten-----	75	
Molybdenum-----	10	
Rhenium-----	10	
Uranium-----	5	10
D. Tungsten-----	65	
Uranium-----	35	
E. Tungsten-----	75	
Uranium-----	25	15
F. Tungsten-----	35	
Molybdenum-----	35	
Uranium-----	30	

In our experiments we have found that alloys
with low uranium contents can be manufactured
by mixing the powders, subjecting same to a high
pressure to form an ingot. The ingot or special
shapes then may be sintered and forged or
swaged, rolled or drawn to a convenient shape
from which the various parts can be manufac-
tured, for which this alloy is particularly suit-
able. Binary alloys of high uranium content
are difficult to swage and must be manufactured
by a sintering process only.

This swaging difficulty, however, can, in cer-
tain cases, be overcome if other elements of the
tungsten group are added, such as molybdenum
or rhenium. Tests conducted on the use of the
alloys described for electrical make and break
contacts indicated that the material has good
properties both as far as contact resistance and
material transfer are concerned. This is the
case, both if the materials are operated against
each other or against a contact of this composi-
tion or under polarized conditions.

We have found that the desirable characteris-
tics described above will not be disturbed if
small proportions of other ingredients are pres-
ent from the iron group materials, such as iron,
cobalt and nickel, or small percentages of tan-
talum, columbium, chromium and manganese.

We have also found that we can use our new
alloying composition as a refractory base for a
material composition consisting of high melting
point materials taken from the group molyb-
denum, tungsten, rhenium and containing sub-
stantial quantities of uranium impregnated with
low melting point materials taken from the
group copper, silver, gold, platinum and palladi-
um and their alloys.

Since certain changes in producing the above alloy and certain modifications in the composition which embody the invention may be made, without departing from its scope, it is intended that all matter contained in the above description shall be interpreted as illustrative and not in a limited sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the

invention, which as a matter of language might be said to fall therebetween.

What is claimed is:

1. An electric contact element formed of an alloy of .1 to 35% uranium and the balance substantially all tungsten.

2. An electric contact element formed of a metal composition containing at least 65% tungsten and .1 to 35% uranium.

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