

# UNITED STATES PATENT OFFICE.

CHARLES WILLIS WARD, OF NEW YORK, N. Y.

## ALLOY.

SPECIFICATION forming part of Letters Patent No. 384,731, dated June 19, 1888.

Application filed November 23, 1887. Serial No. 255,994. (No specimens.)

*To all whom it may concern:*

Be it known that I, CHARLES WILLIS WARD, a citizen of the United States, residing in the city, county, and State of New York, but temporarily residing at Geneva, Switzerland, have invented a new and useful Improvement in Alloys; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention consists of an alloy of platinum and other metals, and is particularly useful in manufacturing parts of watches—such as the levers, forks, escapement-wheels, spirals, balance-wheels, &c.

I am aware that alloys of palladium have been used for these purposes; but these palladium alloys are too expensive to be employed in the lower grades of cheap watch-movements.

The object of my invention is to produce an alloy which is comparatively inexpensive and which is also inoxidizable and non-magnetic, and which shall possess sufficient of the qualities of steel—viz., hardness, ductility, elasticity, capability of being tempered, and small dilation or expansiveness, to admit of the construction of non-magnetic parts of watches cheaply, and to construct non-magnetic compensation-balances sufficiently correct in compensative functions to be employed in cheap grades of watch-movements, thus producing time-keepers at low prices and which will be unaffected by magnetism and rust. These results I have accomplished with the alloy herein described, by which I am enabled to produce balances at about one-fourth of the cost of compensation-balances made from palladium alloys.

My alloy is composed of bismuth, platinum, silver, and steel in about the following proportions: platinum, twenty to forty parts; silver, twenty to forty parts; bismuth, twenty to forty parts; steel, one to ten parts. These

proportions may be somewhat varied within the percentages named without changing the essential characteristics of the alloy.

I employ the ordinary processes for melting platinum in the manufacture of my alloy. Consequently, as these processes are well known to science, I do not herein describe them.

I have found that the above-described alloy is capable of being tempered, that it is hard, ductile, elastic, inoxidizable, and non-magnetic, and that compensation-balances constructed therefrom give sufficiently good results in time-keeping to be successfully employed in the cheaper grades of pocket-watches.

I am aware that alloys have been compounded wherein platinum has been used to form a component part thereof, as is described in various publications relating to metals and their alloys; and these alloys I do not broadly claim as my invention, but I do claim the alloy herein described in about the percentages mentioned.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An alloy composed of platinum, silver, bismuth, and steel, substantially as described.

2. An alloy composed of platinum, silver, bismuth, and steel, in about the proportions as herein described, as set forth.

3. An alloy composed of platinum, twenty to forty parts; silver, twenty to forty parts; bismuth, twenty to forty parts, and steel, one to ten parts, substantially as described.

In witness whereof I affix my signature in the presence of two witnesses.

CHARLES WILLIS WARD.

Witnesses:

M. DEPIERRE,  
S. CALVERT SMITH.