UNITED STATES PATENT OFFICE.

THOMAS W. SPARKS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN ALLOYS FOR THE MANUFACTURE OF SHOT.

Specification forming part of Letters Patent No. **204,856**, dated June 11, 1878; application filed January 31, 1878.

To all whom it may concern:

Be it known that I, THOMAS W. SPARKS, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Alloys for the Manufacture of Shot, of which the following is a specification:

The object of my invention is to manufacture an alloy for conversion into shot of a harder and more penetrating quality than the shot in common use; and this object I attain in the manner which I will now proceed to decribe.

The ordinary process of manufacturing shot is first to make what is known as "temper" by melting, or, as it is technically termed, "boiling," arsenic in melted lead for several hours, and casting the product into small ingots, which are subsequently melted with additional lead, and the molten mass converted into shot in the usual manner.

In carrying out my invention, I boil lead, antimony, and arsenic together for about nine hours, and then cast it into pigs, which are taken up the shot-tower, there melted, and converted into shot.

I have found that a mixture of two hundred pounds of lead, forty-two pounds of antimony, and sixty-five pounds of arsenic will produce very hard shot; but the proportions may be varied according to the degree of hardness desired.

Another way of carrying my invention into effect is to first make a temper of lead, antimony, and arsenic, boiled together for nine or ten hours, then remelting this temper with additional lead, and converting the mass into shot.

I claim as my invention—

The within-described alloy for the manufacture of shot, said alloy consisting of lead, antimony, and arsenic, combined in proportions substantially as herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS W. SPARKS.

Witnesses:

HUBERT HOWSON,

HENRY HOWSON, Jr.