

United States Patent Office.

THOMAS TAYLOR, OF WASHINGTON, DISTRICT OF COLUMBIA.

Letters Patent No. 93,137, dated July 27, 1869; antedated July 15, 1869.

IMPROVED ALLOY FOR SABOTS OF PROJECTILES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, THOMAS TAYLOR, of Washington, in the District of Columbia, have invented a new and improved Metallic Composition for the Sabots of Rifle or Smooth-Bore Projectiles; and I do hereby declare that the following is a full and exact description thereof.

The nature of my invention consists in a certain composition of metals forming an alloy for the sabots of rifle and smooth-bore projectiles, so that, in connection with certain formations of the same, they will perform the best function or results, expand, take the grooves in the case of rifle-cannon, or fly off after leaving the gun.

An experimental experience has enabled me to ascertain the best combinations of metals forming an alloy for the sabots of rifle-projectiles or of smooth-bore. Further extensive experiments have shown that an alloy, composed of tin, lead, and copper, forms a valuable composition for sabot-metal.

This composition has been used of late by the United States Army Ordnance Bureau, in all their late experiments, with the view of testing its value. I have used it in my experiments on the 150-pounder, 300-pounder, and 600-pounder, twelve-inch.

The sabot takes the grooves well, and they never strip in action.

The use of tin in the alloy is to add strength to the compound, as well as to increase the lubricating quality, so necessary. Too great increase of tin causes the mass to crystallize, and form tubes on cooling, which weakens much the sabot; but by the addition of copper, within certain limits, further toughness is given to the compound, and without the formation of crystalline tubes.

I have found in practice that the alloy may be varied somewhat in its proportions, but the following is the composition of the alloy, and proportions I use generally for projectiles of heavy calibre: Tin, seventy-eight pounds; lead, one hundred and twenty

pounds; copper, three pounds; that is to say, when the projectiles do not exceed in weight six hundred pounds, and with charges of mammoth powder not exceeding seventy-five pounds. I sometimes use six pounds of copper, but in that case I diminish the proportion of tin. The points to be desired are toughness and lubricating quality, with economy. The use of lead gives, with tin and copper, softness, with great strength, with cheapness. Too great increase of copper causes the alloy to retain its heat too long for practical purposes. Were a much larger proportion used than that given in the proportions set forth, a workman would require a great many more moulds, as the alloy runs so slowly, and it has not been found that any practical benefit would be derived from the addition of copper, over and above that given herein. But were heavier projectiles to be made than those now in use, and used with higher charges, or charges with more explosive force, I would increase the proportion of copper materially, but I would also diminish the proportion of tin, as copper is less apt to form crystalline tubes than tin.

In my extensive experiments, at Washington Arsenal and Fortress Monroe, I have used many alloys with lead and of lead, that is, lead forming the principal metal. I have found that antimony, zinc, and iron will harden lead, but they do not add to the strength of the alloy or compound formed. Their tendency is to form alloy of hardness, with brittleness, and wholly void of the lubricating quality desired.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent of the United States, is—

An alloy or composition of metals for metallic sabots for projectiles, composed of copper, tin, and lead, in all proportions.

THOMAS TAYLOR.

Witnesses:

A. BREASTED,
THOMAS TAYLOR, Jr.