

## UNITED STATES PATENT OFFICE.

CHARLES J. A. DICK, OF PITTSBURG, PENNSYLVANIA.

## IMPROVEMENT IN ALLOYS OF COPPER FOR BEARINGS.

Specification forming part of Letters Patent No. 125,549, dated April 9, 1872.

Specification describing an Improved Alloy for Bearings, invented by CHARLES J. A. DICK, of Hesse Darmstadt, Germany, but at present residing in Pittsburg, Pennsylvania.

My invention consists of phosphorized alloys of copper and tin, with the addition of a certain limited proportion of lead, as hereafter stated, and with or without other metals.

I have discovered that by adding lead to phosphorized alloys of copper and tin, for which Letters Patent No. 115,220 were granted to George Montefiore Levi and Charles Maurice Kiinzel on the 23d day of May, 1871, these alloys become especially valuable for journal and other bearings; provided, however, that the quantity of lead added does not exceed twelve per cent. of the total weight of the perfected alloy. The alloy thus produced is sufficiently tough, hard, and durable for bearings and for similar uses, and at the same time less liable to become unduly heated by friction than the phosphorized alloy alone. Other metals, such as zinc, for instance, may be added, and the component quantity thereof regulated in accordance with the degree of toughness it is desired to retain, the toughness and also in a certain measure the hardness of the perfected alloy decreasing as the component quantities of lead, zinc, &c., are increased. As soon as

the ingredients composing the alloy are fused they are well stirred and cast into the molds.

I will give a few examples, which, with the foregoing explanation, will suffice to instruct those skilled in the art how my invention may be carried into effect.

For bearings which have to support shocks and at the same time require considerable hardness I use eighty-two parts of copper, ten of tin, one of phosphorus, and seven of lead. Bearings for which resistance to friction alone has to be kept in view may be composed of seventy-one and one-half parts of copper, nine of tin, nine of lead, ten of zinc, and one-half of phosphorus.

I do not, however, restrict myself to the proportions above stated; but

I claim—

Phosphorized alloys of copper and tin, with the addition of a limited proportion of lead, and with or without other metals.

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

C. J. A. DICK.

Witnesses:

WM. A. STEEL,  
HARRY SMITH.