

(No Model.)

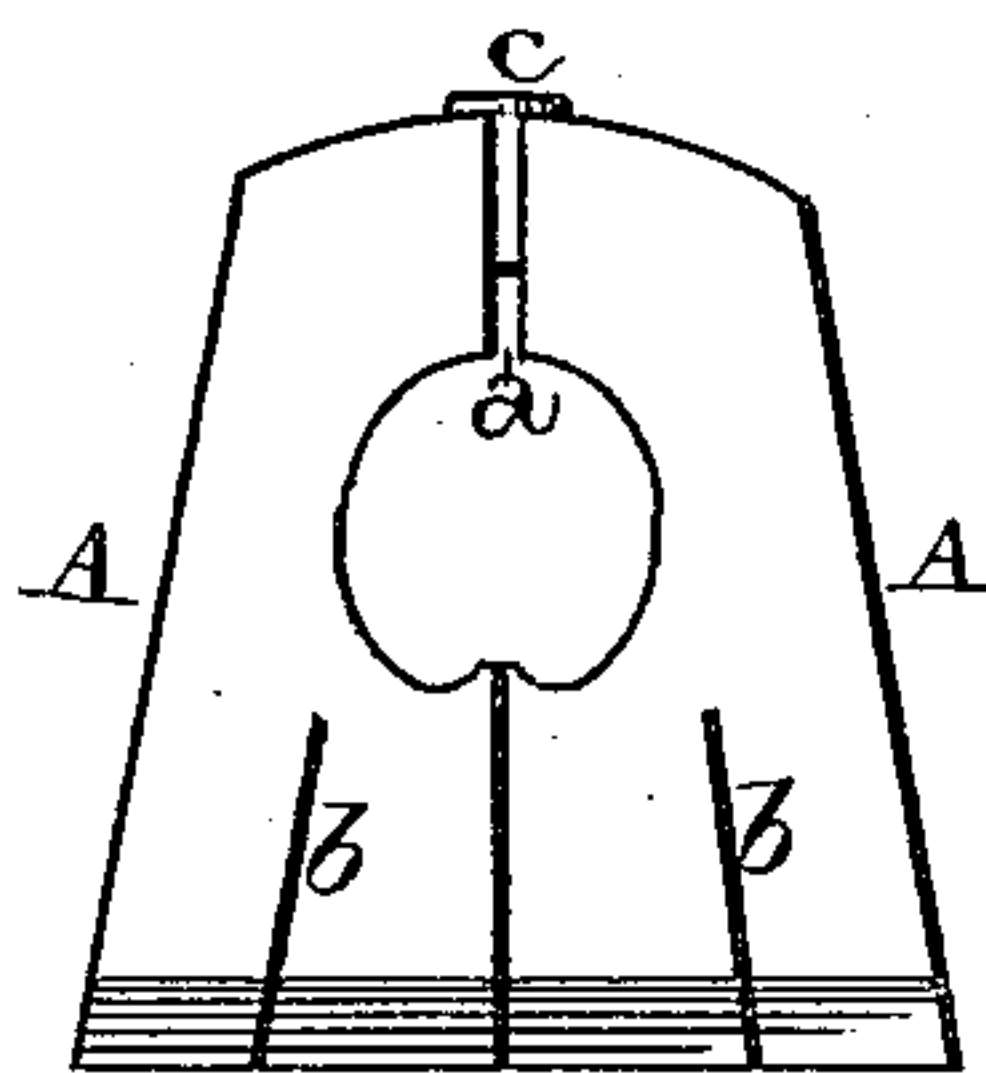
A. H. LUCAS & E. C. KEYS.

SECURING DIAMONDS IN METALLIC PLATES FOR STONE SAWS.

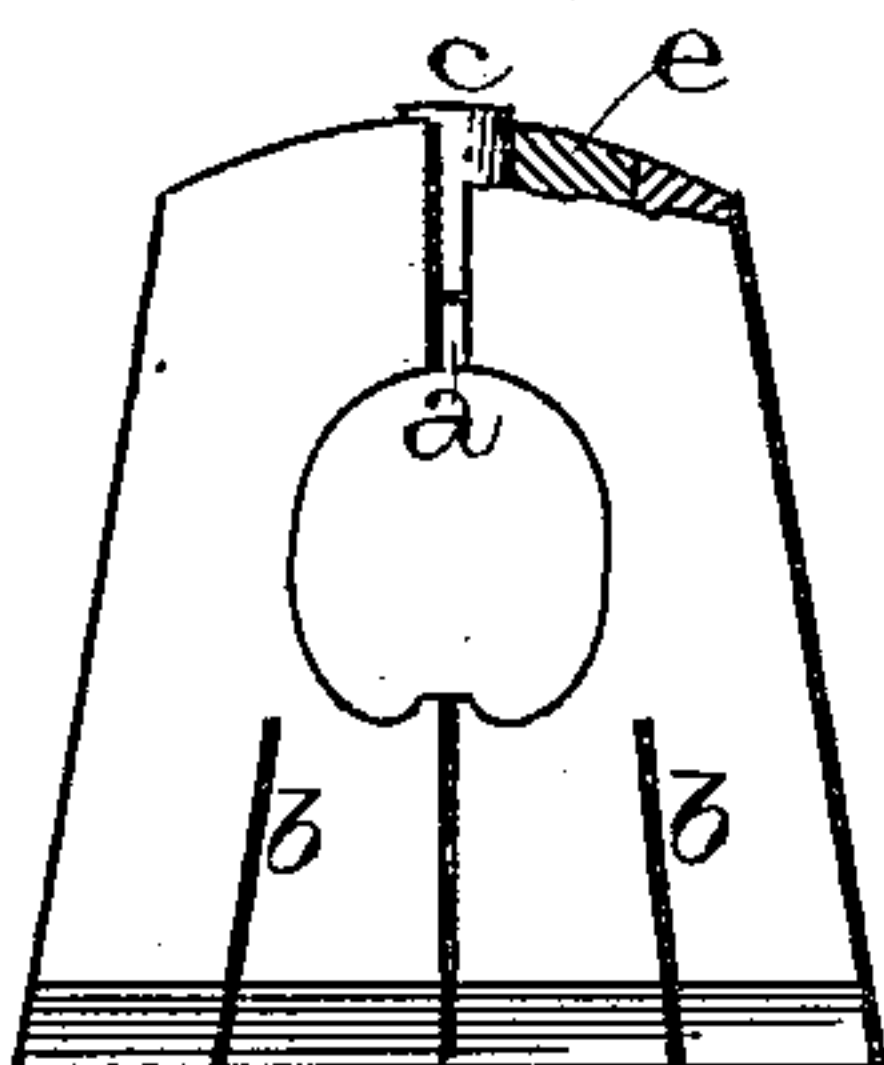
No. 249,646.

Patented Nov. 15, 1881.

*Fig. 1.*



*Fig. 2.*



*Witnesses.*

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# UNITED STATES PATENT OFFICE.

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## SECURING DIAMONDS IN METALLIC PLATES FOR STONE-SAWS.

SPECIFICATION forming part of Letters Patent No. 249,646, dated November 15, 1881.

Application filed July 23, 1881. (No model.)

*To all whom it may concern:*

Be it known that we, AUSTIN H. LUCAS and EZRA C. KEYS, citizens of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Securing Diamonds in Metallic Plates for Stone-Saws; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Our invention relates to an improvement in securing diamonds or carbons in metallic plates that are to be clamped or wedged in openings in the saw-blades for sawing stone, and in introducing a plate of iridium in front of the diamond to protect the diamond-holding plate against the destructive action of sand during the operation of sawing.

The object of our invention is twofold: first, to secure the diamonds of saws for sawing stone in their position; and, secondly, to protect the metal plates in which the diamonds are embedded against the cutting of the sand, which is very destructive in front of the diamonds.

The known processes of placing and securing diamonds in their proper positions on saw-blades for sawing stone are very slow, difficult, and costly, and require a degree of skill not attained by ordinary mechanics. It is therefore of great importance to discover a means by which the diamonds can be readily placed and rigidly held until worn out, when the holding-plate can be removed from the saw-plate to be recast and used again. There is also, aside from the placing and holding of the diamonds in their proper positions, another difficulty to overcome—viz., the cutting away by the sand of the plate that holds the diamond—which is so rapid as to require new plates before the diamonds have become unserviceable, and although the hardest steel has been used for making these plates they only have in part answered the purpose. To remove these ob-

jectionable features we have made the improvements hereinafter described.

The accompanying drawings represent our invention.

Figure 1 represents a side view of the holding-plate with the diamond inserted. Fig. 2 shows the holding-plate with a diamond and a plate of iridium in front of it.

The holding-plate A is similar in form to that shown in Patent No. 180,429, tapering from the heel to its somewhat thicker rounded upper edge that protrudes beyond the edge of the saw-blade. This plate is inserted into a fitting-opening in the saw-blade, and there confined by wedges from underneath and kept from sliding sidewise by means of grooves at its straight side edges and corresponding V-bevels on the saw-blade. In the center of the plate A is an opening, from which extends upward to the base of the diamond a narrow slit, *a*, which may be cut after the diamond has been embedded, or be made in casting of the plate. The slit *a* is to impart a degree of compressibility to the upper end of the plate A, for additionally securing the diamond placed above. The plate A may also be made of two equal parts jointed longitudinally, and to increase its elasticity incisions *b* may be made, as shown in the said patent.

The material we use for the plate A is what is commonly called "phosphor-bronze metal." This, when melted, is run into molds, to be chilled. In the molds, previous to the introduction of the metal, the diamonds *c* are placed and adjusted so that the metal, when poured in, surrounds and holds them. This metal possesses great hardness with pliability, by which it is peculiarly adapted for the purpose, and from experience it is ascertained that it holds the diamonds better than any other known substance. In front of the diamond, in the upper edge of the plate A, is a slight cavity dove-tailed at its sides, and into this a plate, *e*, of iridium is forced toward and in contact with the diamond; or the iridium may be placed in the mold with the diamond and attached to the plate in the casting, either of which answers the same purpose. The plate of iridium, being of greater hardness than any other metal known,



prevents the sand from cutting the plate A at the base of the diamond, and assists to some extent in cutting the stone, and may, when properly shaped, be used for cutting the softer kind of stones without the diamond.

Having thus described our invention, we claim—

1. In a saw, the plate A, made of phosphor-bronze metal, substantially as shown.
2. In a saw, the combination of a removable plate having a diamond or cutting-point se-

cured thereto, with a piece of iridium, which is inserted in the edge of the plate in advance of the cutting-point, substantially as described.

3. A saw for cutting stone, provided with pieces of iridium, which are inserted in its cutting-edges, substantially as set forth.

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