

UNITED STATES PATENT OFFICE.

RICHARD KRAUSE, OF BRESLAU, GERMANY.

PROCESS OF SETTING DIAMONDS FOR INDUSTRIAL PURPOSES.

SPECIFICATION forming part of Letters Patent No. 674,923, dated May 28, 1901.

Application filed December 22, 1898. Serial No. 700,071. (No specimens.)

To all whom it may concern:

Be it known that I, RICHARD KRAUSE, a subject of the Emperor of Germany, residing at Breslau, Empire of Germany, have invented a certain new and useful Improved Process of Setting Diamonds for Industrial Purposes, of which the following is a full, clear, and exact description.

The present invention consists in a process for setting diamonds for industrial purposes.

Diamonds which are set in tools for industrial purposes are generally incased in metal, so as to prevent the stone, which is of itself brittle, from splitting and to enable its working surface to be applied as conveniently as possible. The methods hitherto employed consist in incasing the stone in metal by casting the latter around it or pressing the same around the stone or by electrodepositing the entire setting. In the two former cases the stone is brought in contact with molten or very hot metal, which has the effect of injuring it and in most cases rendering it brittle and less durable, while in the latter case the character of metal that must be deposited by the electric process does not provide a setting of sufficient strength for all purposes. Moreover, the hermetic inclosure of the stone is difficult to attain by means of the first two of the above-mentioned methods, since the cast metal has pores or flaws, and the pressed metal seldom closes onto the very irregular form of the stone at every point. The metal oxidizes at the contact-surfaces with the diamonds at these points, and thus a very small space remains between the stone and the metal setting, which fills with a yielding oxid and allows the stone to become loosened when it is subjected to much wear and tear, nor does this kind of setting adequately protect the stone against splitting. These disadvantages may be clearly observed by stripping the setting off a stone. By means of my improved process all these difficulties and disadvantages are avoided, and the stone is absolutely hermetically inclosed in the metal setting without in any way injuring the diamond.

The process is carried out in the following manner: The surfaces of the diamond are first properly cleaned, and the stone is then covered with a metallic precipitation by any known chemical process. This precipitation closes hermetically onto the stone and is then rendered thicker by means of the well-known galvanoplastic process. The layer of metal thus produced on the stone is then provided with a thicker coating of metal of adequate strength cast onto the same, the casting taking place advantageously *in vacuo*—i. e., in an exhausted mold—in order to attain a pure dense casting, the galvanoplastic layer of metal becoming alloyed with the metal cast onto the same. The metal mantle produced on the stone by the galvanic process prevents the stone from coming into direct contact with the molten metal subsequently cast on the same and with which the said layer combines, without, however, impairing its hermetic closure on the stone. The metal layer by means of which the first layer is strengthened combines with the molten metal and prevents the destruction or partial destruction of the thin envelopment of metal first produced. The process of casting permits the use of a hard metal that will produce a setting of ample durability to withstand a great amount of wear and tear without getting loose or breaking. Since the objects are very small the casting *in vacuo* can be easily effected by allowing the molten metal to rise in the small mold, from which the air has been exhausted.

I claim as my invention—

1. A process for setting diamonds in hard metal for industrial and instrumental purposes, which consists in producing on the stone a thin shell or coating of metal by galvanoplastic process, then forming the body of the setting by casting hard metal around, and alloying it with the thin metallic shell previously formed, substantially in the manner and for the purpose described.

2. The process for setting diamonds for industrial and instrumental purposes which consists in first producing on the stone a gal-

vanoplastic coating of metal and then casting a metal setting onto said casting *in vacuo*, substantially as described.

5 3. The process of setting diamonds for industrial purposes, which consists in first chemically precipitating a hermetic metallic coating on the stone, then depositing on the stone a thin metallic shell by galvanoplastic process, and then forming the body of the

mounting around the stone by casting hard metal around it and alloying said hard metal with the thin metallic shell already applied.

In witness whereof I have hereunto set my hand in presence of two witnesses.

RICHARD KRAUSE.

Witnesses:

OSKAR GILDNER,
HERMANN BARTSCH.