No. 881,621

PATENTED MAR. 10, 1908.

R. A. ROWLAND & W. J. MAHNKE.

ABRASIVE TOOL AND MOUNTING.

APPLICATION FILED FEB. 25, 1907.

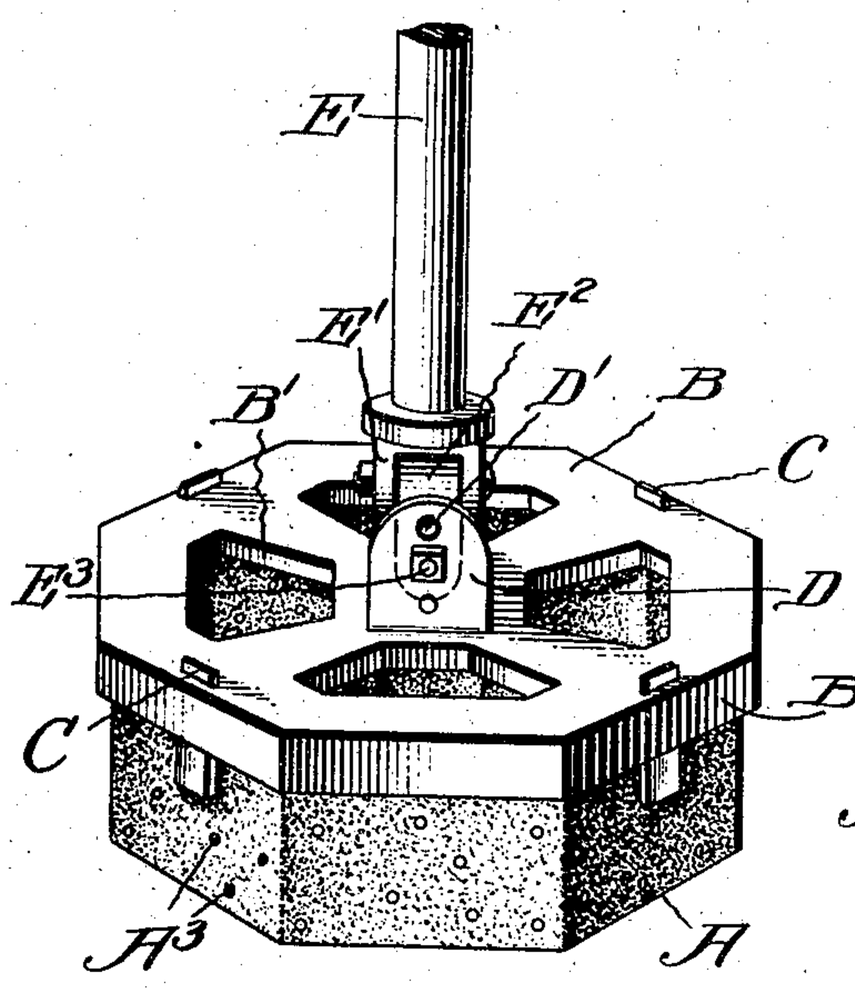
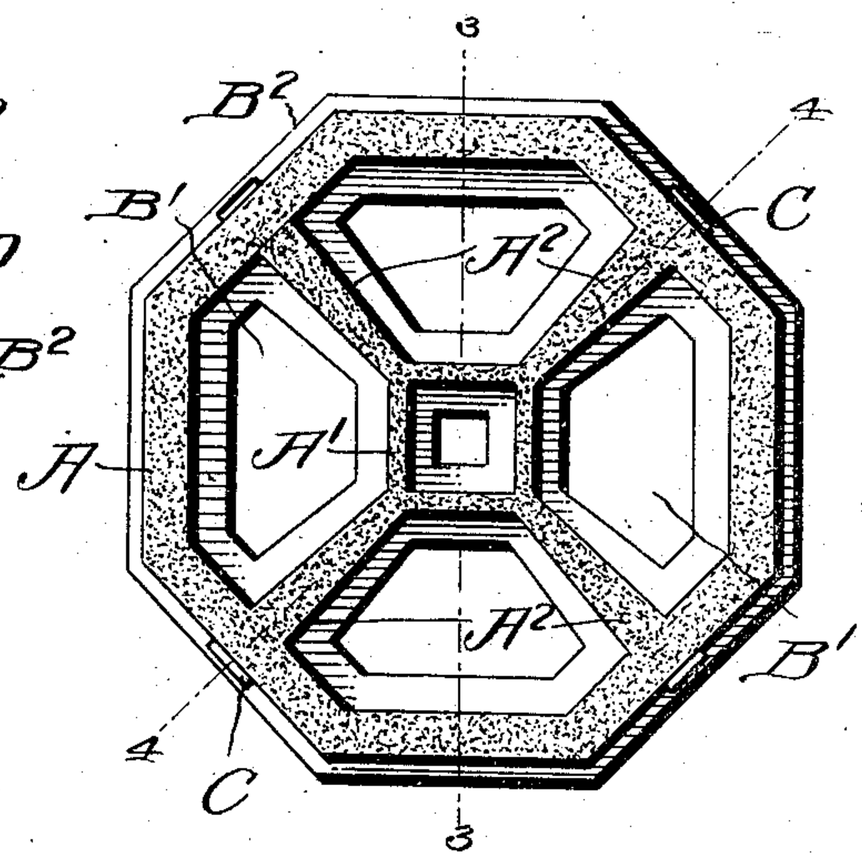


Fig. 1.

Fig. 2.



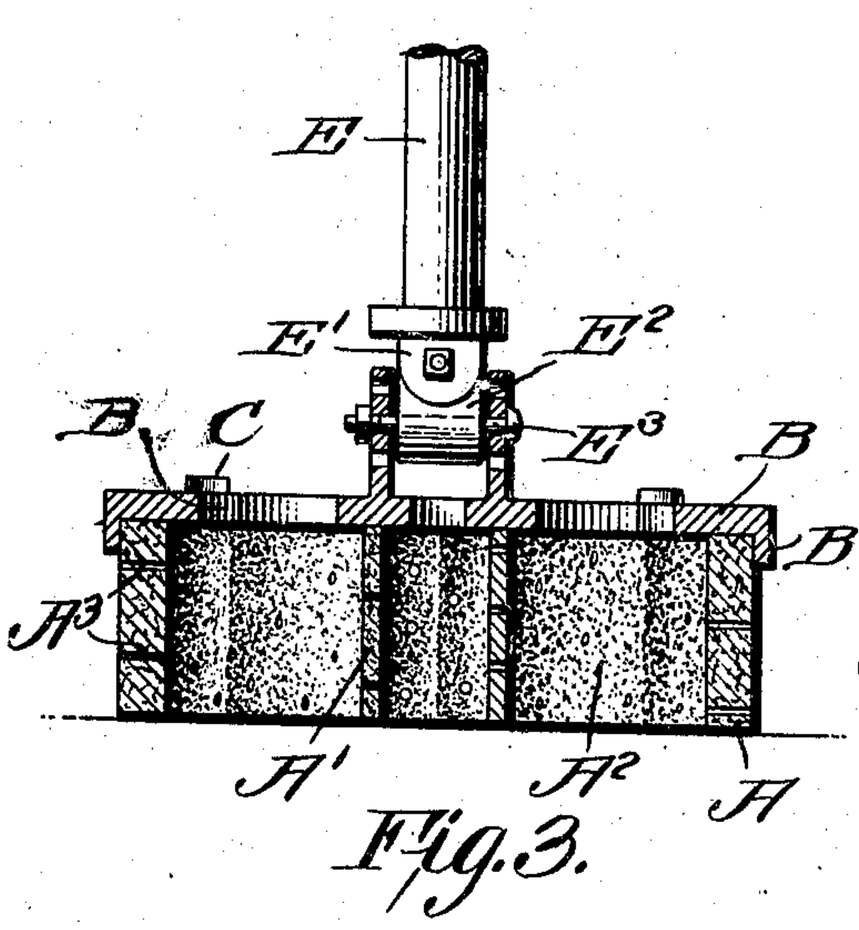


Fig. 3.

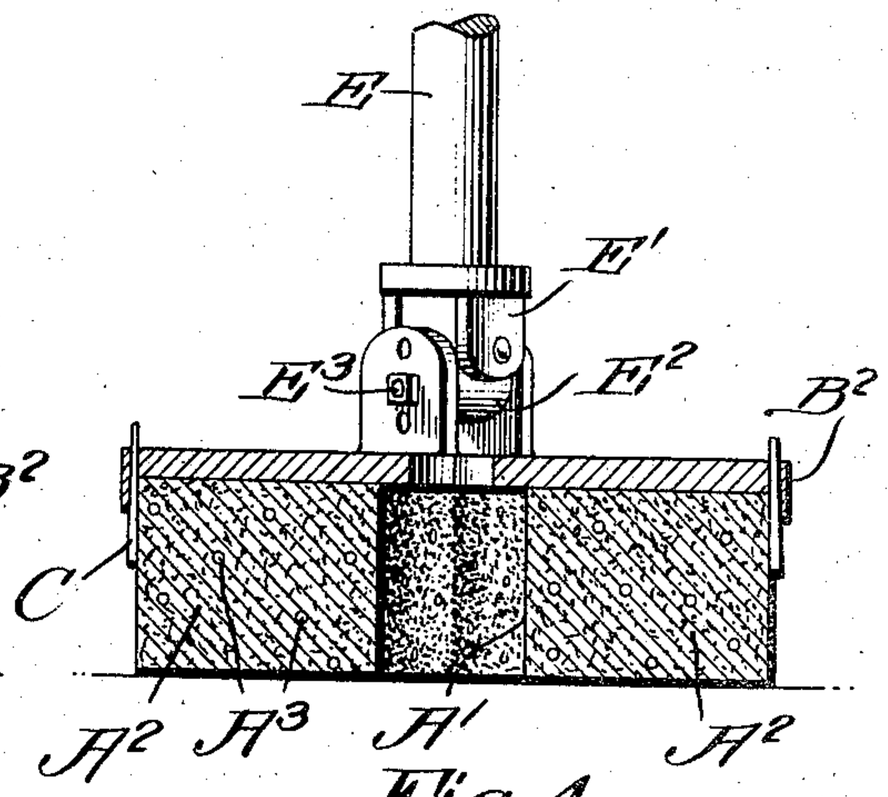


Fig. 4.

Witnesses

Oliver W. Holmes

C. B. McBath

Inventors

Robert A. Rowland.

W. J. Mahnke and

By O'Meara & Brock

Attorneys

UNITED STATES PATENT OFFICE.

ROBERT A. ROWLAND AND WILLIAM J. MAHNKE, OF CLEVELAND, OHIO.

ABRASIVE TOOL AND MOUNTING.

No. 881,621. Specification of Letters Patent. Patented March 10, 1908

Application filed February 25, 1907. Serial No. 359,087.

To all whom it may concern:

Be it known that we, ROBERT A. ROWLAND and WILLIAM J. MAHNKE, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in an Abrasive Tool and Mounting, of which the following is a specification.

This invention relates to an abrasive tool intended for dressing and smoothing marble, granite and other blocks of stone.

The object of the invention is to distribute the abrasive material in such a manner that it will perform the greatest amount of work in a given time. This result is accomplished in two ways, first, by forming the abrasive tool in such a manner that the material of which it is composed is so arranged or distributed that there will be an even wear of the under face of the tool, and secondly, by so constructing the abrasive tool that a supply of water can be fed continuously to all parts of it, thus keeping the wearing face of the tool cooled, and at the same time removing the waste material ground from the stone. Unless the waste material formed by the grinding away of the portions of stone and also of the grinding surface of the tool, it becomes gummy and interposes a layer of waste between the surface of the tool, and the unground surface of the stone, thus interfering with the cutting action of the abrasive material and increasing the amount of time required to grind to the required extent.

Other objects of the invention is to provide a holder for the abrasive material from which the material may be easily removed, and provide means for quickly attaching said holder to a rotating shaft, and also to provide means for adjusting the holder and material with respect to the shaft and the stone as either the stone or the material wears away.

In the drawings forming a part of this specification:—Figure 1 is a perspective view of our abrading tool and holder connected to the end portion of a shaft. Fig. 2 is an inverted plan view of the abrading tool and the holder. Fig. 3 is a section on the line 3—3 of Fig. 2. Fig. 4 is a section on the line 4—4 of Fig. 2.

In these drawings A represents the abrading instrument and this may be formed of any grinding composition which it may be necessary or desirable to use, and which can be changed to suit various kinds of stone. This abrading tool is formed by molding and is octagonal in shape. The abrading tool, is hollow and is provided with an interior web consisting of a central core A′ squared in cross-section and also hollow and the core is connected to the sides by radially extending arms A^2 which extends from the corners of the core A′ to the sides of the tool. This construction is very clearly shown in Fig. 2. It will furthermore, be noted that the peripheral walls of the tool are thicker than the walls of the core A′ and that the arm A^2 which practically forms divisional or partition walls, since they divide the interior of the tool into four compartments, gradually decrease in thickness as they approach the core A′.

The object of this construction is to secure an even wear of the grinding face of the tool, for it will be obvious that as the tool is rotated the peripheral wall will travel at a greater speed than the central core portion and the outer portions of the arms will also have a higher velocity than the inner portions and consequently there will be a greater wear upon the portions of the tool most distant from the center than upon that portion of the grinding surface adjacent the center. It will therefore be obvious that if the abrasive tool was solid it would not only be much heavier but it would also wear unevenly and the grinding action, therefore, would not be uniform over all portions of the stone being operated upon at the same time. Therefore, as only portions of the surface of the stone beneath the grinding tool were being acted upon at a time, that is, that part of the surface immediately in contact with an unworn portion of the abrasive tool, a longer time would be required to grind a certain amount of waste material from the stone. As the grinding action is also dependent upon the prompt removal of waste material, so that the abrasive tool will continuously present a clean face, to the stone it is necessary to supply water to all parts of the grinding face.

The manner of supplying the water to the tool is, of course immaterial but it is common to play a hose upon the tool during the grinding operation. With a tool constructed as shown in our drawings, it will be obvious that the stream of water upon the tool will enter the interior compartments as the tool is

rotated and the compartments are successively brought into position to receive the stream.

To give free passage of the water to all parts of the grinding surface we provide both the peripheral wall, the walls of the core A′ and the arms or partitions A^2 with a plurality of small transverse perforations A^3, so that water will pass freely and rapidly from one portion of the tool to the other, thus thoroughly cleaning and cooling all parts and removing rapidly all waste material. The removal of this waste is also greatly facilitated by forming the tool hollow instead of making it solid, which would permit the collection of waste material under the tool by preventing an effective stream of water reaching the surfaces of the stone upon which the tool was rotated.

A metal holder B is cast in the same form as the abrasive material A and is provided with openings B′, four in number corresponding with the four compartments of the abrasive tool. The casting B is also provided with a flange B^2, and molded abrasive tool is inserted within this flange which is normally sufficient to hold it in place during the grinding action. In order, however, that there may be no danger of the abrasive material falling from the holder, while being lifted into position upon the stone, we form slots in the marginal portions of the holder B and drive wedges C, into these slots, which wedges bear against sides of the abrasive tool and lock the same tightly in the holder B.

Centrally upon the holder B we form parallel ears D, which are provided with a plurality of alining perforations D′. The shaft E is rotated in any convenient manner and this shaft is provided at its lower end with ears E′ between which are pivotally held a sleeve or coupling member E^2 and a pin E^3. The pin E^3 passes through one set of alining perforations D′. By changing the pin from one set of perforations to the other, it will be obvious that the tool may be raised or lowered with reference to the stone.

The octagonal shape of the tool possesses advantages over a circular shape and especially in the two following particulars:—An annular block will not slip in the holder as might be the case of one circular in form and held in a circular holder. In case the stone has ridges upon it, the angles of the face of the block aid in grinding away said ridges whereas a cylindrical block having a circular bottom or wearing surface would be likely to ride upon such ridges as the tool was moved while rotating back and forth upon the stone.

Having thus fully described our invention, what we claim as new and desire to secure by Letters Patent, is:—

1. A grinding tool consisting of a rectangular hollow block of molded abrasive material a central core therein, and radial arms connecting the central core and the sides of the block, said arms forming partitions dividing the interior of the block into compartments, said partitions and core being transversely perforated.

2. A grinding tool of the kind described consisting of a block of abrasive material octagonal in form and hollow, a web formed upon the interior of the block and comprising a core and radial arms, said core and arms being transversely perforated, the sides of the block being of greater thickness than the walls of the core and the radial arms decreasing in thickness as they approach the core.

ROBT. A. ROWLAND.
WILLIAM J. MAHNKE.

Witnesses:
GEO. H. CAMP,
CHARLES S. WILMOT.