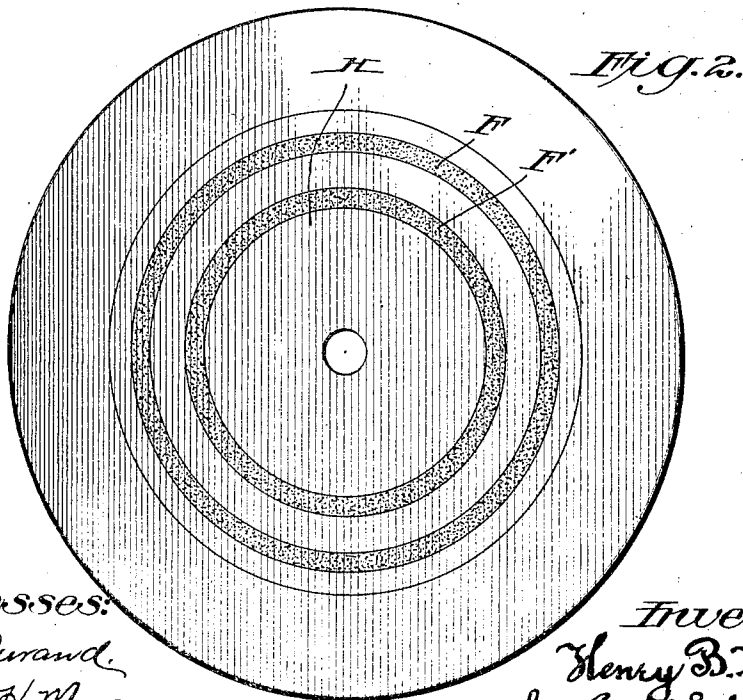
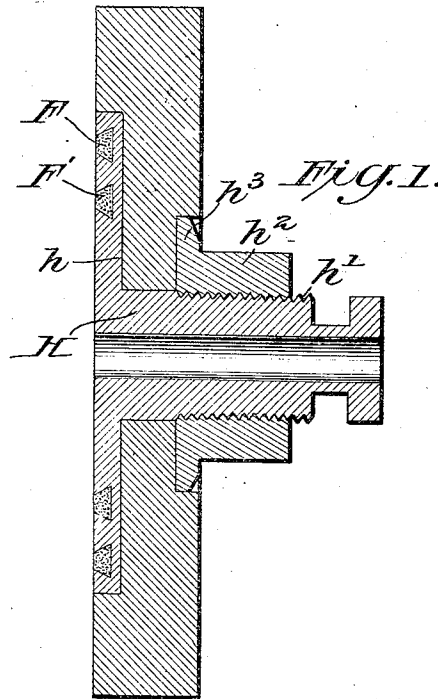


H. B. NICHOLS.
GRINDING WHEEL.

APPLICATION FILED AUG. 22, 1910.

977,325.

Patented Nov. 29, 1910



Witnesses:
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UNITED STATES PATENT OFFICE.

HENRY B. NICHOLS, OF PHILADELPHIA, PENNSYLVANIA.

GRINDING-WHEEL.

977,325.

Specification of Letters Patent. Patented Nov. 29, 1910.

Original application filed May 27, 1910, Serial No. 563,755. Divided and this application filed August 22, 1910. Serial No. 578,367.

To all whom it may concern:

Be it known that I, HENRY B. NICHOLS, a citizen of the United States, residing at Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Grinding-Wheels, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to grinding machines and especially to certain forms of grinding wheels intended to be used with automatic calipering devices.

Briefly stated the invention comprises a wheel having a clamping plate in which are set ring inserts of anti-friction material, upon which the feeler or contact device of an automatic caliper is adapted to rest during the operation of the wheel, so as to indicate wear on the same, by recession of the clamping plate, and to compensate for the same as disclosed in my applications and patents as follows: Serial No. 535,091, filed December 27, 1909, as a division of each of two prior applications, Serial No. 457,875, filed September 5, 1908, patented December 28, 1909, Patent No. 944,902; and Serial No. 472,236, filed January 14, 1909, patented December 28, 1909, Patent No. 944,903. In the two patented cases the claims are directed to grinding machines as such; in the prior application No. 535,091, I have claimed the automatic calipers as such; in a divisional application Serial No. 563,755, filed May 27, 1910, I have claimed a grinding wheel with anti-friction rings or inserts in its face or back, which broadly speaking might be either in the body of the wheel or in the metal clamps thereof; and in the present case, which is a division of my said prior application Serial No. 563,755, I claim specifically a wheel with an anti-friction insert, in the form of a ring or rings, applied to the clamping plate or plates.

My invention is shown in the accompanying drawing in which—

Figure 1 is a transverse section of a grinding wheel embodying the invention, and Fig. 2 is a face view thereof.

Referring to the drawings, W is the wheel body formed of abrasive material and secured upon a metal hub H shown as having an extending flange formed of a clamping plate h and screw-threaded at h' to receive the correspondingly threaded sleeve h^2 of a

secondary clamping plate h^3 . In the face of the clamp h are the inserts F F', constituting the subject of the present invention. These inserts may be formed of any one of several kinds of material but the best material I have found as a body ingredient is graphite. After the plate h is grooved, the anti-friction rings are molded in the grooves. One process of molding consists of mixing graphite with water to form a thick paste, and then pressing this into the grooves so as to expel as much of the water as possible, and subsequently evaporating the rest. This process, however, is not entirely reliable in its results because of the shrinkage of the paste in drying, unless constant and very heavy pressure is employed, such as that obtainable by hydraulic means. Another method employed is a binder which under ordinary conditions of pressure and temperature is a solid, and which can remain permanently incorporated with the graphite. Such a binder I have found in sulfur, which does not impair the efficiency of the graphite for my purpose. It is first melted and the powdered graphite is stirred or ground into it in the proportion of two parts of graphite to one of sulfur. The grooved flange is then heated to a temperature of about 212° Fahrenheit, the paste is pressed into the grooves, and the whole is covered and allowed to cool uniformly. In whichever way they are formed, the two rings F and F' present anti-friction surfaces for the calipers, sufficiently hard for accurate dimensioning.

By using a metal clamping plate with the ring inserts set into it, I gain several advantages. For one thing, it enables me to use standard or "stock" wheels; for another, it enables pure graphite to be employed, if inserted in the grooves under pressure, which of course would be impossible when applying the material to the body of a grinding wheel direct.

I have shown the grooves in the flange h as dove-tail or under-cut grooves, but it is to be understood that this is subject to variation, and other shapes may be employed without departing from the invention. Other changes may obviously be made in non-essentials such as the shape, dimensions and arrangements of the clamping plate and hub and the like. It is to be understood that all of these are contemplated by me, when necessary, the essential feature being the

ring insert of inserts in a clamping plate, for the purpose stated.

I have deemed it unnecessary to show the calipers herein, since the same are fully disclosed in all of my prior applications and patents referred to, which are to be read with this application, in order to fully understand the invention.

Having thus described my invention what I claim and desire to secure by Letters Patent is—

A grinding wheel having its body of abra-

sive material, a clamping plate adapted to secure said body to a hub or shaft, said plate having an annular groove in its surface, and a mass of anti-friction material compressed in said groove for calipering purposes.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY B. NICHOLS.

Witnesses:

C. B. VOYNOW,

C. H. RYAN.