E. P. BINFORD.

DENTAL GRINDING WHEEL AND MANDREL THEREFOR.

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1,162,970.

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Fig. 1.

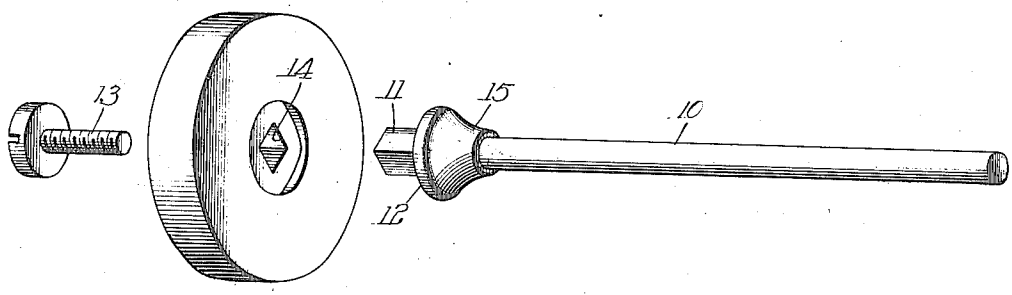
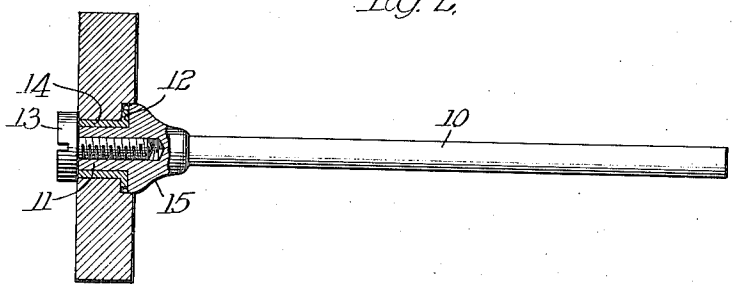


Fig. 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

EDGAR P. BINFORD, OF CHICAGO, ILLINOIS.

DENTAL GRINDING-WHEEL AND MANDREL THEREFOR.

1,162,970. Specification of Letters Patent. Patented Dec. 7, 1915.

Application filed April 15, 1911. Serial No. 621,330.

To all whom it may concern:

Be it known that I, EDGAR P. BINFORD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Dental Grinding-Wheels and Mandrels Therefor, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention pertains to dental grinding wheels and mandrels therefor, the object being to improve upon devices of this character, particularly upon the manner of securing the grinding wheel to the mandrel. In ordinary practice the mandrel is formed at its end with a threaded axial hole which receives a machine screw, the grinding wheel being clamped between the head of the screw and the end of the mandrel. This construction is subject to the great disadvantage that the grinding wheel can only be turned in the direction for tightening the clamping screw; if it be turned in the opposite direction, the resistance of the wheel to turning will be transmitted, by reason of the friction between the wheel and the screw, to the head of the the screw, and the latter will loosen. When the screw becomes loose, the grinding wheel can turn upon the mandrel, and the grinding action cannot be continued. This disadvantage is of considerable importance for the reason that, in dental practice, it is frequently very desirable to be able to turn the grinding wheel in both directions,—and the impossibility of doing so is a considerable annoyance. My invention, therefore, is directed to the obviation of this disadvantage without sacrificing the simplicity or cheapness of the device. The construction referred to above is subject to the further disadvantage that the grinding wheel very soon wears away the clamping screw and the part of the mandrel which the wheel engages; so that, after a time, it is not possible to secure the grinding wheel firmly to the mandrel: a new mandrel and wheel must then be employed. My invention is further directed to the obviation of this disadvantage.

A dental grindstone and mandrel therefor constructed in accordance with my invention is described in the following specification and shown in the accompanying drawings, in which:—

Figure 1 is a perspective view showing the grinding wheel detached from the mandrel; and Fig. 2 is a sectional side elevation showing the grinding wheel in place upon the mandrel.

In carrying my invention into effect, I form the mandrel 10, at its end, with a square boss 11 which is adapted to enter a corresponding square aperture in the grinding wheel, the wheel being clamped in place on the boss, against a shoulder 12 on the mandrel, by means of a clamping screw 13, which enters an axial screw hole in the end of the mandrel. It will be seen that this construction relieves the clamping screw of all strain, except that due to direct end pressure on the grinding wheel in a direction to remove the same: the strain due to the resistance of the grinding wheel to turning is entirely taken by the square boss on the mandrel. There is therefore no tendency to stripping of the screw threads,—which occurs frequently in devices of this character as heretofore constructed; and the grinding wheel may be turned equally as well in one direction as in the other.

A metallic bushing 14 is tightly secured in the aperture of the grinding wheel and serves to keep the material of the grinding wheel, which, it will be remembered, is formed of carborundum or other material chosen for its abrading qualities, out of contact with the clamping screw 13 or the shoulder 12. The provision of this bushing prevents the wearing away of the boss 11 and shoulder 12, due to the continual abrading action of the grinding wheel, and thus considerably lengthens the life of the device.

It has been found, in practice, that the provision of the screw hole in the mandrel weakens the latter to such an extent that it is liable to bend when heavy pressure is applied to the grinding wheel. My invention obviates this disadvantage to some extent, as the clamping screw used may be considerably shorter than the screws used in previous constructions,—for the reason that, in my device, the screw has to withstand very little pressure. In order to completely avoid the weakening of the mandrel, however, I

provide it with an enlarged head 15 extending backward beyond the end of the screw hole in the mandrel.

I have thus provided a construction by means of which the grinding wheel is mounted on the mandrel so that the grinding wheel is capable of being conveniently and quickly removed from the mandrel, so that the grinding wheel may be turned in any direction at will, so that there is little or no strain on the clamping screw, so that the weakening effect of the screw hole in the mandrel is avoided, and so that the grinding wheel cannot exercise any abrading action upon the mandrel. These advantages are obtained by a very simple and economical construction.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. The combination with a dental grinding wheel having a non-circular aperture formed therethrough and a protecting bushing firmly secured in said opening and of a corresponding shape therewith, said bushing having a flange at its rear side, of a mandrel for supporting said grinding wheel, said mandrel being formed at its end with a non-circular boss or projection adapted to fit in said bushing and having an axial screw-hole in the end thereof, and said mandrel being formed with an enlarged outwardly extending flange portion engaging said first flange, said wheel being recessed to receive both flanges so that the flange on the mandrel is substantially flush with the face of the wheel, and a screw adapted to enter the screw-hole of said mandrel for retaining said grinding wheel upon said boss, whereby said grinding wheel is mounted on said mandrel so as to be non-rotatable with respect thereto in either direction, and so that its material does not come in contact with said mandrel.

2. The combination with a dental grinding wheel having a recess and a non-circular aperture therein, of a mandrel for supporting said grinding wheel, said mandrel being formed at its end with a non-circular projection adapted to fit in said aperture and an enlarged outwardly extending flange portion fitting in said recess and substantially flush with the face of the wheel, and a screw clamping said grinding wheel to said mandrel.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

E. P. BINFORD.

Witnesses:
MABEL REYNOLDS,
CHARLES G. CAPE.