

(No Model.)

2 Sheets—Sheet 1.

G. B. ECKHARDT.
STONE GRINDING WHEEL.

No. 442,801.

Patented Dec. 16. 1890.

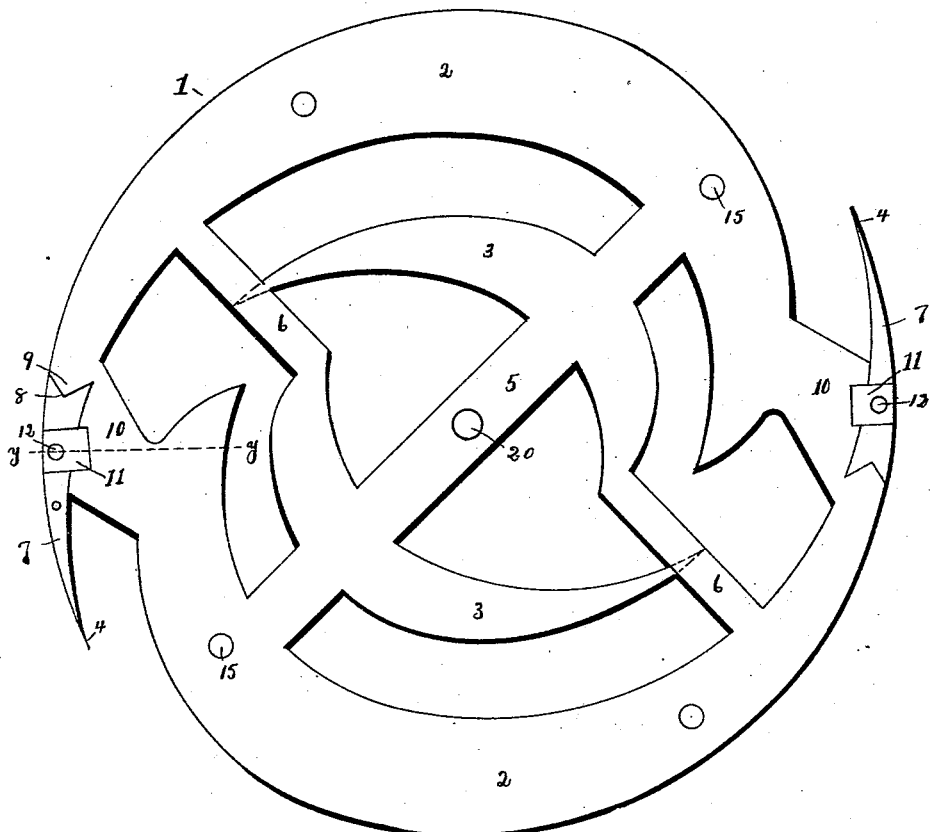


Fig. 7



Fig. 7

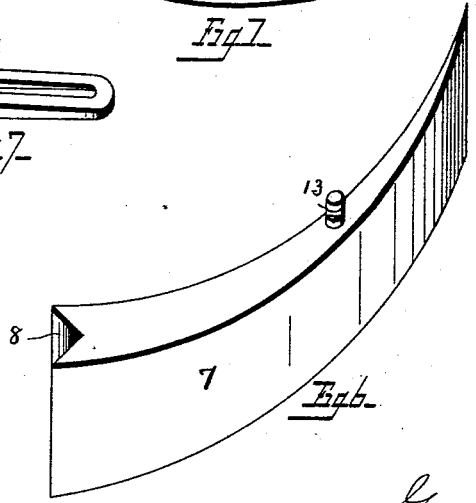


Fig. 8

WITNESSES

Carroll J. Webster.
W. W. Elliott.

INVENTOR

George B. Eckhardt
By Myers & Webster
Attys

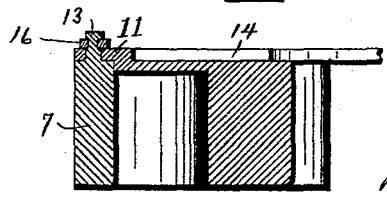
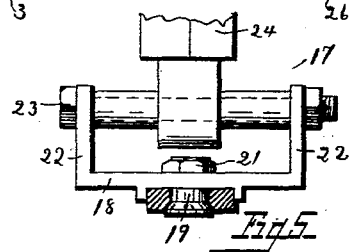
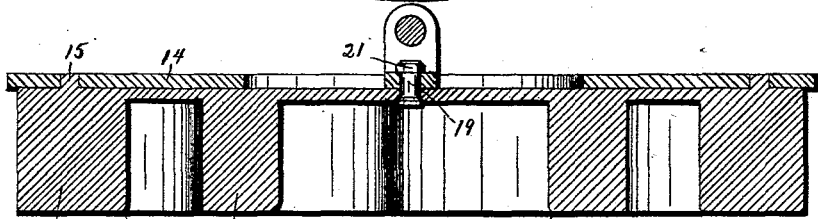
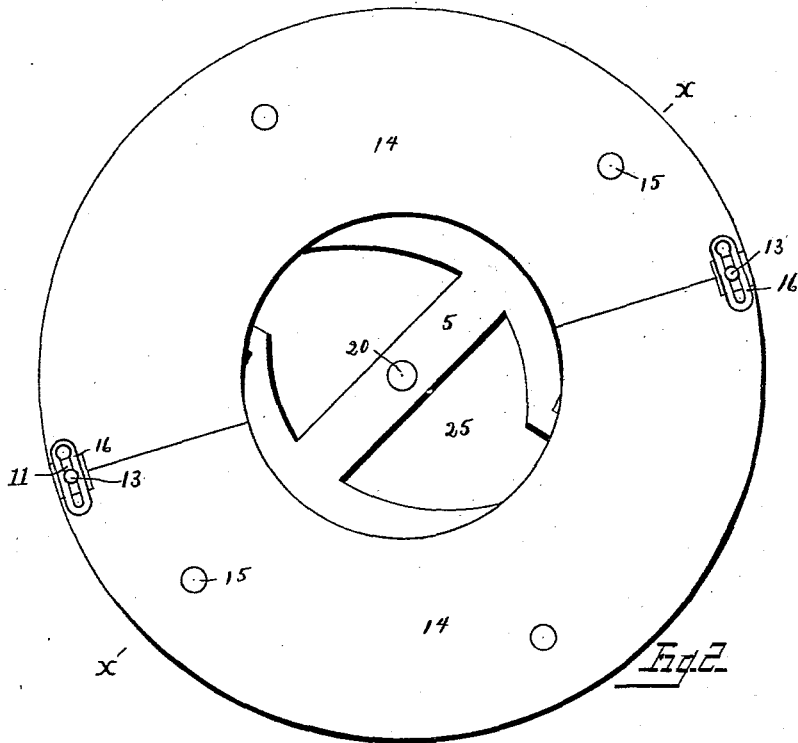
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2 Sheets—Sheet 2.

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WITNESSES

Carroll J. Webster

A. W. Eckhardt

INVENTOR

George B. Eckhardt
By Myers & Webster
Atty

UNITED STATES PATENT OFFICE.

GEORGE B. ECKHARDT, OF TOLEDO, OHIO.

STONE-GRINDING WHEEL.

SPECIFICATION forming part of Letters Patent No. 442,801, dated December 16, 1890.

Application filed April 14, 1890. Serial No. 347,915. (No model.)

To all whom it may concern:

Be it known that I, GEORGE B. ECKHARDT, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Stone-Grinding Wheels; and I do hereby declare that the following is a full, clear, and exact description of the invention, which 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 the figures of reference marked thereon, which form part of this specification.

My invention relates to improvements in wheels for grinding or polishing stone.

Heretofore grinding-wheels have been generally constructed of a series of concentric rings secured to a suitable backing provided with an opening through which the material used to grind down the stone is fed. It has been found in practice that the best cutting result of the material cannot be obtained for the reason that it would not be changed between the rings so as to present a fresh surface to the stone as the wheel was operated, as that part nearest the center would be but slightly agitated or changed, thereby leaving the work to be done by the material confined between the rings farthest removed from the center. It is the object of the invention to overcome these obstacles by producing a grinding-wheel which shall be so arranged that the cutting material will be drawn toward and away from the center, whereby the said cutting material is caused to be brought into contact with every part of the grinding-wheel, thereby increasing the utility of the wheel and the rapidity of grinding down the stone.

With these objects in view the invention consists, broadly, of a grinding-wheel constructed with a series of fingers arranged in such a manner as to exert a centripetal action upon the grinding material, whereby when the wheel is in operation there will be a constant circulation of a grinding material to the center.

The invention further consists in the various novel details of construction, as will be hereinafter fully described in the specifica-

tion, illustrated in the drawings, and more particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, and in which like numerals of reference indicate corresponding parts, I have illustrated one form of device embodying the essential features of my invention, although the same may be carried into effect in other ways without in the least departing from the spirit thereof, and in these drawings—

Figure 1 is a top plan view of my improved grinding-wheel, showing its peculiar construction. Fig. 2 is a similar view showing the cover in place upon the wheel. Fig. 3 is a vertical sectional view taken on the line $x x$ of Fig. 2, showing more particularly the relation between the cover and wheel. Fig. 4 is a similar view taken on the line $y y$ of Fig. 1, showing the manner of holding the cover upon the wheel. Fig. 5 is an enlarged detail view showing the form of hanger for connecting with the wheel, the actuating shaft being broken off. Fig. 6 is a perspective detail view of a removable point used on this wheel, and Fig. 7 is a perspective detail view of the wedge-shaped key for holding the cover in place upon the wheel.

Referring to the drawings, 1 designates the wheel, which may be constructed of any metal, but preferably in this instance of iron, consisting of two outer fingers 2 and two inner fingers 3. The peripheries of the fingers 2 are involute, or, more properly speaking, eccentric with regard to the pivotal point about which the wheel revolves, while the inner sides are of a like configuration, only in a less degree, and terminate at 4, forming points, the function of which will be described farther on. The inner fingers are also eccentrically arranged. The fingers are connected and braced by means of plates 5 and 6, which are of sufficient thickness to give rigidity to the said fingers. It has been found in practice that when the wheel is made of cast-iron the points of the outer fingers crumble when in use, from the fact that, being thinner than the remaining portion of the finger, they become chilled sooner, and are consequently brittle and apt to break and cannot be sharpened when they have become

dulled. In order to overcome these obstacles, I provide the wheel with a removable point 7, provided with an angular recess 8, adapted to engage an angular point 9 on the fingers.

5 Upon the inner ends of the fingers 2 are cast plates 10, which connect with the outer ends of the fingers, as shown, and against which the points abut. The plates 10 also carry lugs or projections 11, provided with apertures 12, through which extend studs 13 upon the point. The cover 14 is constructed, preferably, of two semicircular pieces, which are provided with apertures adapted to engage upwardly-extending projections 15 upon the wheels to hold the said cover from moving.

15 In order to lock the covers and the points securely in place, wedge-shaped slotted keys 16 are employed which engage with the studs 13 of the points, so that by driving the wedges in the points are drawn up against the covers, thus securely clamping the two parts together.

20 The coupling 17 for communicating with the motion-imparting mechanism consists of a base 18, provided with an aperture adapted to receive a bolt 19, which extends through an opening 20 in the wheel, and nut 21, serving to clamp the base and wheel securely together. At each end the base is provided with an upwardly-extending flange 22, through which extends a bolt 23 for clamping the lower end on the shaft 24 in place, which shaft communicates with a motion-imparting mechanism.

35 In operation the wheel is revolved in the ordinary manner, and the cutting material, which may be chilled shot, sand, or emery, is fed to the interior of the wheel through the space 25. As the wheel revolves, the cutting material will work its way under the lower part of the wheel until it strikes the points, when they will act as gatherers to drive the material back to the center of the wheel again, from which point it works its way out in the manner just described. As the utility of this device depends largely upon the rapidity with which it can grind away stone, it follows that the greater the amount of material that

can work its way between the grinding-faces and stone the more rapid will be the operation. In order to give as large a feed as possible, I bevel off the inner faces of each of the fingers, as shown at 26, so that as the wheel revolves and the material strikes the inclined faces just referred to it will pass under the wheel more rapidly than were a straight wall presented, as with wheels of ordinary construction.

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

60 1. A grinding-wheel provided with eccentrically-disposed fingers and plates connecting said fingers, as set forth.

2. A grinding-wheel constructed with a series of eccentrically-arranged fingers and removable points carried by the outer series of fingers.

3. A grinding-wheel constructed of a series of eccentrically-arranged fingers, the outer of the said series being provided with removable points, a cover adapted to fit on said wheel, and means for clamping wheel and cover together.

4. The combination of a grinding-wheel constructed of a series of fingers provided with removable points, studs carried by the said fingers and points, a cover adapted to fit on the said wheel and having apertures adapted to engage the said studs, and a wedge-shaped key adapted to engage the studs on the points to clamp the said points and cover securely in place.

5. A grinding-wheel constructed with a series of fingers arranged substantially eccentric to its pivotal point and having the inner faces of each of the fingers beveled off at the point at which it contacts with the stone.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

GEORGE B. ECKHARDT.

Witnesses:

R. W. ELLIOTT,
WILLIAM WEBSTER.