

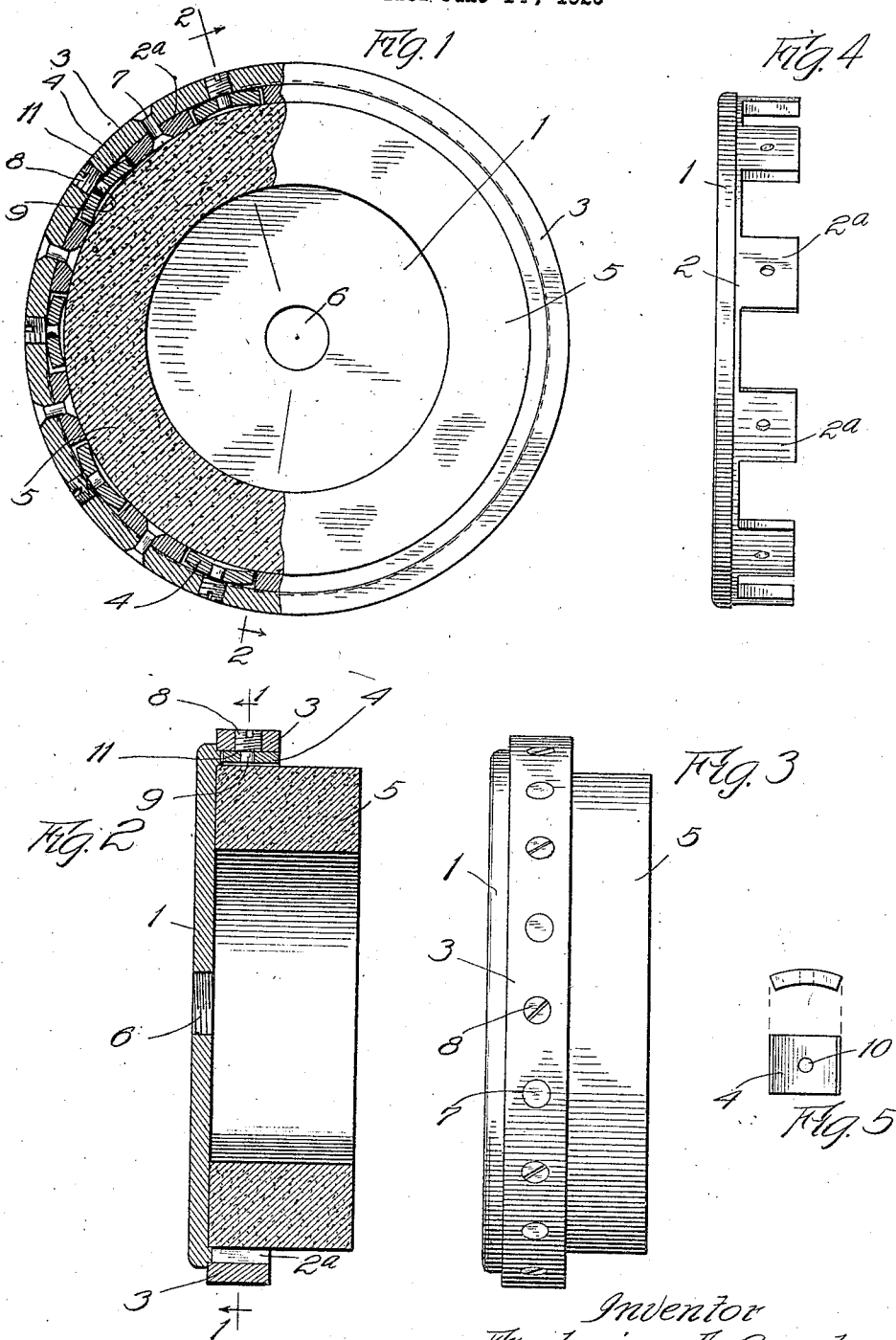
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ABRASIVE-WHEEL CHUCK FOR GRINDING MACHINES

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UNITED STATES PATENT OFFICE.

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ABRASIVE-WHEEL CHUCK FOR GRINDING MACHINES.

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To all whom it may concern:

Be it known that I, FREDERIC E. GARDNER, a citizen of the United States, residing at Beloit, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Abrasive-Wheel Chucks for Grinding Machines, of which the following is a specification.

The invention relates to grinding machines and more particularly to a chuck for holding revolving abrasive wheels of the ring type.

The principal object of my invention is to provide a chuck having improved means for clamping the abrasive wheel in operating position.

Another object is to provide a chuck which is adjustable to varying sizes of abrasive wheels and which permits of quick and easy renewal of worn wheels.

A further object is to provide a simple, durably constructed chuck, of which the clamping device may be readily cleaned to prevent the clogging of its parts with grit.

Further objects and advantages will appear in the following description of the preferred embodiment of my invention.

In the accompanying drawings, Figure 1 represents a plan view of a chuck and ring wheel, one side being partially cut away on a plane indicated by the line 1-1 in Fig. 2. Fig. 2 is a sectional side view taken in the line 2-2 in Fig. 1. Fig. 3 is a side elevation of the chuck and ring wheel. Fig. 4 represents the shell of the chuck. Fig. 5 presents a clamping shoe in plan and side view.

Generally stated, the device is composed of a shell comprising a back plate 1 and an interrupted cylindrical rim 2 upon which is mounted a concentric retaining ring 3, fixed to the rim and supporting clamping shoes 4 adapted to engage and secure an abrasive ring wheel 5.

Referring to Fig. 1, the circular back plate 1 forms the base of the device and is adapted to be attached by any suitable means to the spindle of a grinding machine. As illustrated in this instance, a bore 6 is shown at the center of the back plate, designed to be centered on a grinding machine spindle. The cylindrical rim 2 is integrally formed on the front of the back plate 1,

concentric with the spindle bore 6. Spaced cylindrical segments 2^a are formed on the rim 2, and extend outwardly parallel to and concentric with the axis of the back plate. An annular retaining ring 3 is mounted upon the outer surface of the rim 2 and segments 2^a, and is preferably rigidly attached thereto by riveting the ring to the segments, as indicated at 7.

A clamping shoe 4 is mounted in each space between the segments 2^a. This shoe is in the form of a stiff leaf spring adapted to be forced into contact with the periphery of the abrasive ring 5 and to secure it in position. As seen in Figs. 1 and 2, the shoes 4 are shaped to fit freely within the segmental spaces formed between the segments 2^a and are of somewhat less thickness than the adjoining segments. The shoe is formed with the radius of curvature of its surfaces substantially less than the radius of the rim and segments. A screw 8 is mounted in the retaining ring 3 centrally of each of the segmental spaces. These screws are preferably sunk flush with the periphery of the retaining ring to avoid the obvious danger attending outstanding screw heads on a revolving chuck. Each screw terminates in a stud 9 which engages in a hole 10 located centrally of the shoe and holds the shoe in position. A shoulder 11 formed on each screw at the base of the stud 9 abuts the outer surface of the shoes 4.

With the abrasive ring 5 positioned within the segments 2^a and abutting the back plate 1, the screws 8 may be driven against the shoes 4, forcing them into binding contact with the ring and holding the latter rigidly in its proper position. The spring shoes coact with the shoulders on the screws to lock the latter against backing off in the operation of the chuck.

It will be seen from the description that a considerable variation from the standard diameter of a ring wheel is compensated for by the range of possible adjustment provided in the separable shoes. An important feature also resides in the removable shoes, whereby the spaces about them are always accessible for cleaning out accumulations of grit which otherwise would clog the clamping device and interfere with the ready removal and renewal of the ring wheels, and

with securing them in true position. It is also possible to replace any of the shoes which may be broken in use.

A further advantage is apparent in the removable shoes in that being separate from the supporting structure the clamping pressure applied to the abrasive ring is uniform at the front and rear portions of the shoes, as distinguished from the clamping action

when the shoes are integral with the shell. While I have herein shown and described with considerable particularity the preferred embodiment of my invention, I do not intend to be limited in the interpretation of the appended claims to the details of construction set forth, except as may be necessitated by the prior art.

I claim as my invention:

1. A device of the character described comprising, in combination, a shell having a back plate and a rim comprising spaced cylindrical segments, a ring mounted upon said shell and enclosing said rim, and a plurality of independent clamping elements supported on said ring between said segments.

2. A device of the character described comprising, in combination, a shell having a back plate and a cylindrical rim, a plurality of spaced cylindrical segments formed on said rim, a ring mounted on said rim overlying said segments, and a plurality of separable clamping elements supported on said ring and adapted to be moved radially between said segments.

3. A device of the character described comprising, in combination, a shell, an annular ring attached to said shell, a plurality of removable clamping means mounted on said ring, means for maintaining said clamping means in position, and means for moving said clamping means in a radial direction to engage and secure a grinding wheel.

4. A chuck comprising, in combination, a shell having a web portion forming a back plate and a rim portion forming a series of spaced cylindrical segments, a ring mounted on said shell having fixed engagement with said rim portion, a plurality of separable clamping shoes positioned between said segments, and means for actuating said shoes mounted on said ring.

5. A chuck comprising, in combination, a back plate, a rim formed on said back plate, a ring mounted on said rim, and a plurality of clamping shoes associated with said ring, said clamping shoes being actuated by screw means supported in said ring, and operable to force said shoes inwardly to engage and support the grinding ring.

6. A chuck comprising, in combination, a back plate, an annular rim formed on said back plate, a series of spaced cylindrical segments formed on said rim concentrically

therewith, a ring mounted on said rim, a plurality of screws mounted in said ring extending radially therethrough between said segments, and a plurality of separable clamping shoes supported on and actuated by said screws.

7. A chuck comprising, in combination, a shell, an annular member mounted thereon, a plurality of clamping shoes supported on said member, said shoes comprising curved leaf springs formed with a radius of curvature substantially less than the radius of said annular member, and having apertures substantially at their apex of curvature, and means engaging said apertures for flexing said shoes to increase their radius of curvature.

8. A chuck of the class described having, in combination, a shell comprising a back plate and an annular rim having a plurality of spaced segments extending parallel to the axis of said rim, a ring mounted on said shell concentric with said rim, clamp actuating means carried by said ring, and a plurality of clamping shoes supported by said actuating means, said shoes comprising leaf springs adapted to be compressed by said actuating means.

9. In a chuck of the class described having an annular member adapted to support clamping means, a plurality of clamping devices carried on said annular member comprising actuating screws mounted in said member and removable spring clamping shoes supported on said screws, said spring shoes being adapted to lock said screws in set position.

10. A clamping shoe for chucks having an annular supporting member with segments spaced apart so as to receive the shoes, said shoes being adapted to fit freely between said segments and being curved on a radius shorter than that of the annular supporting member.

11. In a chuck having an annular supporting member, a clamping shoe supported thereon and being curved on a radius substantially less than the radius of said supporting member, a screw mounted in said member, and a stud formed on the end of said screw and having a shoulder formed at its base, said shoe having an aperture therein for engagement by said stud, and being adapted to bear against said shoulder to lock the screw from backing off during operation of the chuck.

12. A chuck of the class described comprising, in combination, a shell having a back plate and an annular rim, a retaining ring mounted on said rim, a plurality of screws mounted in said ring, said screws being spaced radially about the periphery of said ring and extending inwardly, a stud formed on the end of each of said screws having a shoulder formed at its base, and a

plurality of clamping shoes positioned within said ring, said shoes having apertures therein for engagement by said studs.

13. In a chuck having a supporting ring, a radially moving clamping shoe supported thereon and being curved on a radius substantially less than the radius of said ring,

means for applying an inwardly directed force to said shoe, and means for positioning and maintaining said shoe centrally of said first mentioned means. 10

In testimony whereof, I have hereunto set my hand.

FREDERIC E. GARDNER.