

Oct. 21, 1941.

O. A. CLARK

2,259,554

ABRASIVE WHEEL

Filed Dec. 30, 1940

2 Sheets-Sheet 1

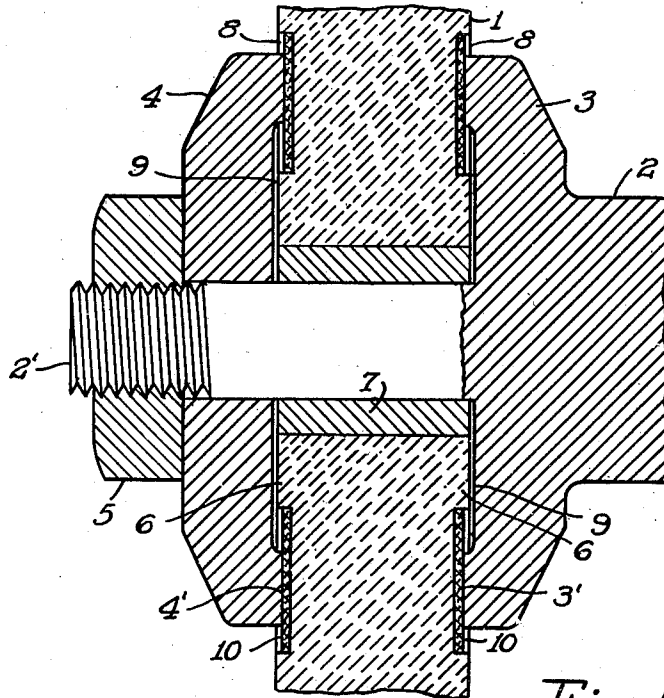


Fig. 1.

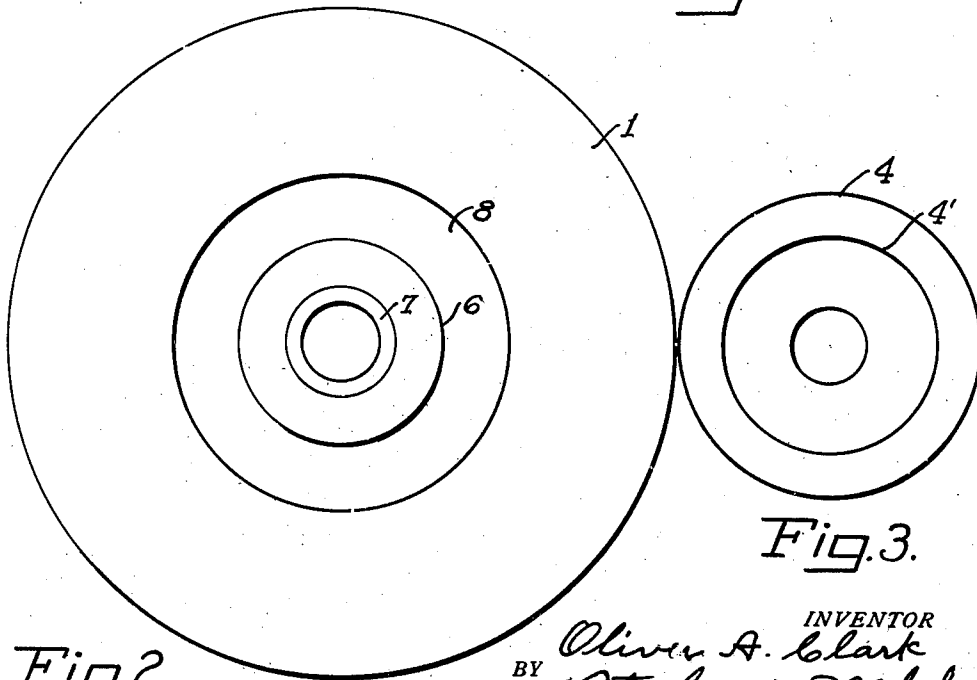


Fig. 2.

Fig. 3.

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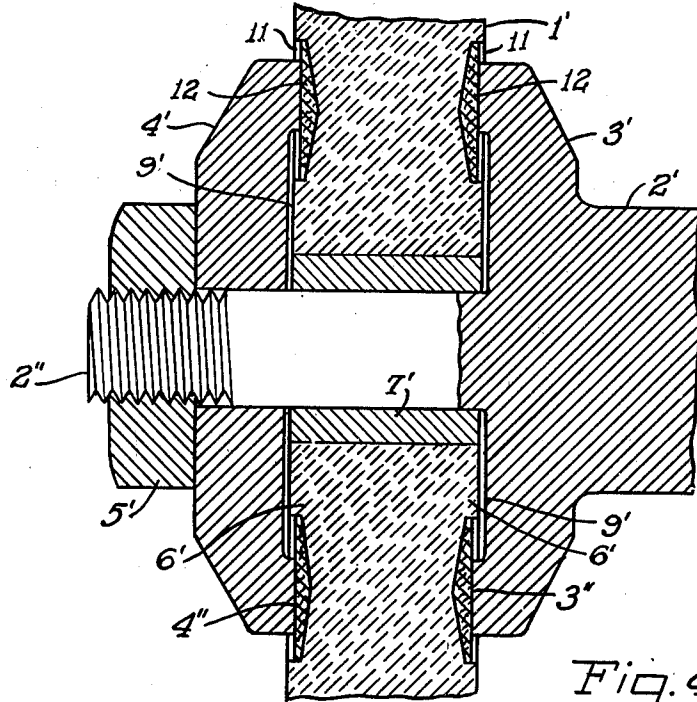


Fig. 4.

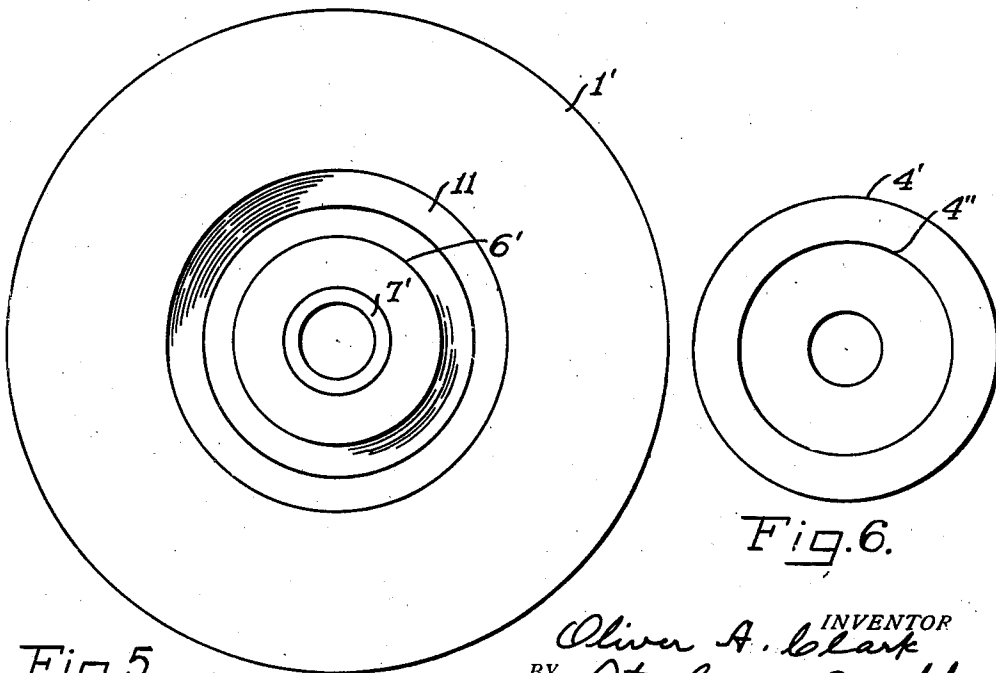


Fig. 5.

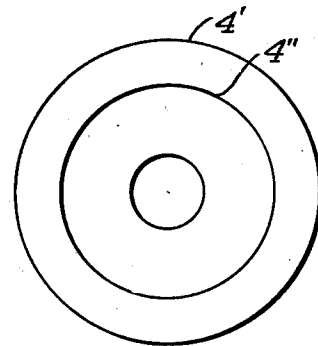


Fig. 6.

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2,259,554

ABRASIVE WHEEL

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Safety Grinding Wheel & Machine Company,
Springfield, Ohio, a corporation of Ohio

Application December 30, 1940, Serial No. 372,260

3 Claims. (Cl. 51—168)

This invention relates to improvements in abrasive grinding wheels, it more particularly relating to means for preventing portions of a wheel which has bursted from flying outwardly by centrifugal force which would result in injury to the workman.

When an abrasive wheel bursts ordinarily the cracks which occur in the wheel extend from the periphery of the wheel to the central bore thereof resulting in segment-like portions which unless restrained will fly outwardly.

The object of this invention is to provide a construction whereby if the wheel bursts the broken segments will be forcibly restrained against outward movement.

Another object of this invention is to provide a construction that is such that when a wheel bursts or is broken, the holding force exerted upon the wheel hub is greater than the centrifugal force generated within the wheel and the segments.

A further and more specific object of the invention is to provide a construction whereby the ends of the hub portion of the wheel are entirely surrounded by annular members which will form in effect a throat which is narrower than the length of the hub so as to prevent the cracked portions of the hub and those portions of the wheel attached thereto from flying outwardly.

In the accompanying drawings:

Fig. 1 is a vertical section of an abrasive wheel and associated parts, a portion of the wheel being broken away.

Fig. 2 is an elevation of one side of the wheel.

Fig. 3 is an elevation of the outer face of one of the clamping collars.

Fig. 4 is a vertical section of an abrasive wheel and associated parts showing a modification, a portion of the wheel being broken away.

Fig. 5 is an elevation of one side of the wheel shown in Fig. 4.

Fig. 6 is an elevation of the outer face of one of the clamping collars shown in Fig. 4.

Referring to the drawings, 1 represents an abrasive wheel of standard or approved construction having straight sides. The wheel is mounted upon a spindle 2 driven from any suitable source of power, being clamped to the spindle by collars 3 and 4, the collar 3 being in the present case formed as an integral part of the spindle while the collar 4 is placed loosely upon the end of the spindle and the collars clamped to the wheel by the nut 5 which is screwed upon the reduced portion 2' of the spindle; the reduced portion of the spindle extending through a central bore in

the hub 6 of the wheel which is provided with a metallic or other type bushing 7.

In carrying out this improvement the wheel is so constructed so as to provide on each side thereof annular recesses 7 and 8 immediately surrounding the ends of the hub 6. Each of the collars 3 and 4 is provided with a recess 9 so as to form in effect an annular flange on each of the collars as indicated at 3' and 4'; these collars being of standard form readily obtainable upon the market. When the parts are assembled and clamped together these flanges 3' and 4' will enter the recess 9 and thereby overhang or enclose the ends of the hub 6. Preferably a resilient washer or gasket 10 is placed in each end of the recess, these washers being in the present case formed of a composition or comparatively soft vulcanized rubber and cork so that when pressure is brought thereon they will not only be compressed but displaced whereby the flanges 3' and 4' will enter the recesses 9 to the extent allowed by such compression and displacement, the diameter of each recess being greater than the diameter of its corresponding washer to permit of the displacement of the washer when comparatively soft vulcanized rubber is used either as a part or the whole of the washer. The washers are merely used to get a better contact for the clamping surfaces between the collars and the wheel so far as the construction shown in Figs. 1 to 3 inclusive is concerned.

It will be seen that with this arrangement when a wheel bursts and cracks from the periphery to the metallic bushing in the bore the hub portions will be positively confined against outward movement by reason of the fact that the flanges of the collars overhang or enclose the ends of the hub and form in effect a converged throat through which the hub portions cannot pass.

In Figs. 4 to 6 inclusive there is shown a modification in which the parts corresponding to parts shown in Figs. 1 to 3 inclusive are given the same reference characters with the addition of a prime exponent. In this modification the recesses in the wheel which surround the hub are indicated at 11 and the bottom of each recess is sloped toward the center so as to provide a recess which is cone-shaped in cross section, the washers indicated at 12 may be cone-shaped in cross section so as to conform to the shapes of the recesses, or flat washers may be employed which are forced by the flanges of the collars into the cone-shaped recess to form in effect cone-shaped washers. These washers thus act either alone or

in conjunction with the flanges of the collars to prevent segments of a burst wheel from flying outwardly because of the wedging action existing between the washers and the walls of the recesses.

By forming the abrasive wheel with straight sides no machining is required as is necessary with a tapered wheel and also such a form of wheel in connection with the recesses which closely surround the hub portion of the wheel permits the use of standard clamping collars which are readily obtainable upon the market.

Having thus described my invention, I claim:

1. In a device of the character described, an abrasive wheel provided with a bore and having straight sides, a spindle extending through a bore in said wheel, said wheel having on each face thereof a recess surrounding the hub thereof, clamping collars carried by said spindle to secure the wheel to said spindle, each of said recesses being of a cone-shape in cross-section in any arc thereof, a washer located in each recess of a cone shape in cross-section in any arc thereof to conform to the shape of the recess, and an annular straight-sided flange on each collar adapted to enter the corresponding recess of the wheel when the parts are assembled.

2. In a device of the character described, an abrasive wheel provided with a bore and having straight sides from bore to periphery, a spindle extending therethrough, clamping collars carried by said spindle for clamping the wheel thereto, each collar having a central recess therein, an annular recess on each face of said wheel adjacent the hub thereof, and an annular straight-sided flange formed on each collar about the recess therein, said flanges being adapted to enter said recesses to embrace the ends of said hub.

3. In a device of the character described, an abrasive wheel provided with a bore and having straight sides from bore to periphery, a spindle extending therethrough, clamping collars carried by said spindle for clamping the wheel thereto, each collar having a central recess therein, an annular recess on each face of said wheel adjacent the hub thereof, and an annular straight-sided flange formed on each collar about the recess therein, said flanges being adapted to enter said recesses to embrace the ends of said hub, and a flexible washer in each recess.

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