May 25, 1943. F. O. HARRIS 2,320,130

GUARD FOR GRINDING WHEELS

Filed March 16, 1942

Fig. 2.

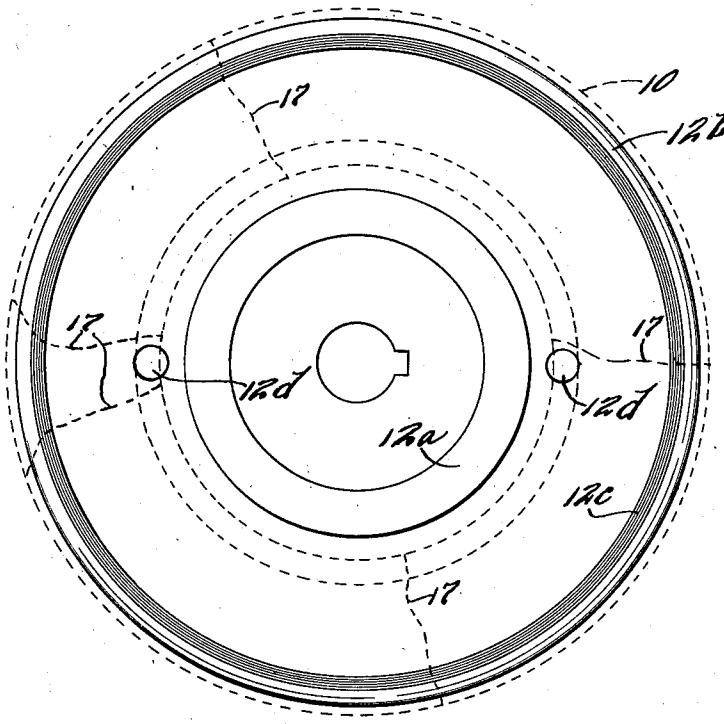
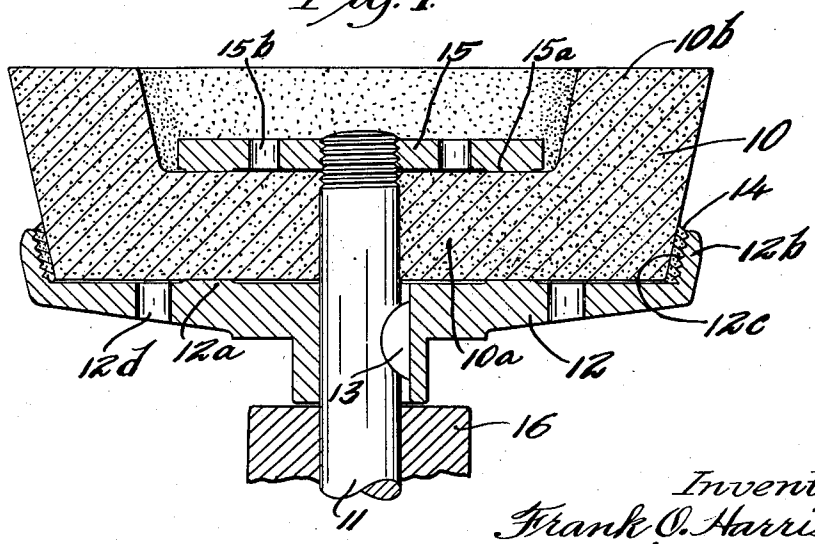


Fig. 1.



Inventor
Frank O. Harris
By Chas. C. Reif
Attorney

Patented May 25, 1943 2,320,130

UNITED STATES PATENT OFFICE

2,320,130

GUARD FOR GRINDING WHEELS

Frank O. Harris, Minneapolis, Minn.

Application March 16, 1942, Serial No. 434,871

5 Claims. (Cl. 51—209)

This invention relates to a guard structure for a grinding wheel and particularly to a grinding wheel of the cup-shaped type. Such grinding wheels have a central plate or disk-like portion and an annular portion extending at one side thereof, which annular portion is usually of a flaring form. These wheels are driven or revolved at very high speeds and it is a frequent occurrence for the wheels to fracture. It has been the common practice heretofore to hold said wheels by means of a rear plate and a front plate. When the wheel fractured when revolving at high speed a portion would be thrown outwardly at great speed. Many frightful accidents have occurred in shops using this type of wheel.

It is an object of the present invention to provide a simple and efficient guard structure for such a cup-shaped type of wheel.

It is a further object of the invention to provide in combination with a cup-shaped wheel, a holding means for said wheel and a flange extending along the outer periphery of said wheel secured to said holding means.

It is a further object of the invention to provide a guard structure for a grinding wheel, which wheel has a central disk-like portion and an annular flange projecting at one side thereof, said structure including a plate engaged by the rear side of said wheel, said plate having an annular flange extending along the periphery of said wheel and a holding plate engaging the front part of said disk or plate-like portion, said plates being secured to a shaft extending axially through said wheel.

It is more specifically an object of the invention to provide a guard structure for a grinding wheel of the cup-shaped type having a central plate-like portion and an annular flange extending at one side thereof comprising a plate engaged by the rear side of said wheel and secured to a shaft extending axially through said wheel, said plate having an annular flange extending along the periphery of said wheel at the rear side thereof and spaced somewhat therefrom together with a holding plate secured to said shaft and engaging the front side of said wheel, said flange preferably being serrated or roughened at its inner side together with a body of material adapted to harden disposed between said flange and the periphery of said wheel.

These and other objects and advantages of the invention will be fully set forth in the following description made in connection with the accompanying drawing in which like reference characters refer to similar parts throughout the several views and in which:

Fig. 1 is a central vertical section through said grinding wheel and structure; and

Fig. 2 is a view in front elevation of the rear holding plate for said wheel, said wheel being indicated in dotted lines.

Referring to the drawing a grinding wheel **10** is shown of the cup-shaped type. Such wheels are made of emery, carborundum or similar hard abrasive material. Said wheel **10** has a central disk or plate-like portion **10***a* and an annular flange **10***b* extending at one side thereof, said flange being somewhat flaring so that the sides thereof are frusto-conical in shape. Wheel **10** is bored to have extend therethrough a central supporting shaft **11**. A rear plate **12** is provided which is engaged by the rear side of the wheel **10** and is shown as having an annular boss **12***a* extending somewhat above the remainder of its surface and engaged directly by wheel **10**. Plate **12** is secured to shaft **11** in any suitable manner as by the key **13**. In accordance with the present invention plate **12** is provided with an annular flange **12***b* which extends along the outer periphery of wheel **10** at the rear portion thereof. While this flange could be varied in position somewhat in the embodiment of the invention illustrated it is shown as spaced slightly from the periphery of wheel **10** at its inner side. Said flange is also shown as having the serrations or corrugations **12***c* at its inner side and some material **14** may be disposed between said flange and the outer periphery of said wheel. This material is preferably one which is plastic and adapted subsequently to harden such as plaster of Paris or some suitable cement. When material **14** is used the corrugations **12***c* form a bond for the material acting to hold it firmly in place. Plate **12** is also shown as provided with a pair of holes **12***d* disposed equal distances from the axis of shaft **11** and adapted to receive the prongs of a spanner wrench. Shaft **11** is shown as threaded at its front end and a holding plate **15** is threaded on said shaft and engages the front side of wheel **10** or the front side of its disk or plate-like portion. Plate **15** is shown as having an annular boss **15***a* thereon which directly engages said wheel. Plate **15** has a circular periphery and is also shown as being provided with holes **15***b* disposed at equal distances from the axis of shaft **11**, which holes are adapted to receive the prongs of a spanner wrench. A portion **16** of a motor casing is shown in Fig. 1 in which shaft **11** is journaled.

The wheel will be secured in place as described and as shown in Fig. 1. While shaft 11 may be revolved in any desired or suitable manner it is a common practice to have said shaft 11 comprise the shaft of a motor, the casing of which is disposed adjacent plate 12. Said casing may be provided with handles adapted to be grasped by the operator. The wheel 10 is revolved at exceedingly high speed. In practice these wheels are revolved at from 3000 to 17,000 revolutions per minute. In the grinding operation it is a more or less frequent happening for the wheels to fracture. As above stated, some very frightful accidents have occurred due to the wheel fracturing and segments thereof being projected outwardly at high speed and striking the operator. The wheels usually fracture along lines as indicated at 17 in Fig. 1, the wheels thus breaking into segments. By providing the flange 12b it will be seen that when the wheel so fractures the broken pieces cannot move outwardly. It is prevented from being projected outwardly by the flange 12b and the flange in a way cooperates with the plate 15 so that there is a sort of a corner about which the angular piece of the wheel cannot move. The broken pieces of wheel are thus retained and the movement of the wheel can be stopped before any accident occurs or any damage is done. The material 14 may or may not be used. The wheels have been operated without this material and the flange 12b functions to prevent the outward movement of the broken parts very successfully.

From the above description it will be seen that I have provided a very simple and efficient guard structure for such a wheel and one that has made such wheels perfectly safe. A very bad hazard present in the use of such wheels has thus been eliminated. The invention has been amply demonstrated in actual practice and found to be very successful and efficient. In fact there has not been one accident in the factory where these wheels are being used and where the invention was developed since the invention has been put into practice.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the parts, without departing from the scope of applicant's invention, which generally stated, consists in a device capable of carrying out the objects above set forth, in the parts and combinations of parts disclosed and defined in the appended claims.

What is claimed is:

1. A grinding wheel structure having in combination, a wheel having a central disk-like portion and an annular flaring flange extending forwardly from its outer portion, said central portion having a bore therethrough, a shaft passing through said bore, a circular disk overlying said disk-like portion and extending to adjacent said flange, said disk being secured to said shaft and a member in the rear of said wheel against which it is held having a peripheral flange extending around the rear portion of the periphery of said wheel and cooperating with said circular disk to prevent a segment of said wheel when broken from being centrifugally projected outwardly.

2. A grinding wheel comprising a thick central portion and a thick flaring flange extending forwardly from the outer side thereof, a supporting and holding means for said wheel including a disk extending over said thick central portion of said wheel, said means including a member in the rear of said wheel having an annular flange extending around the periphery of said wheel at its rear portion whereby should a segment of said wheel between said first mentioned disk and said latter flange be broken loose it will be prevented from being centrifugally projected outwardly by said disk and said last mentioned flange.

3. A grinding wheel having a central disk-like portion and an annular flaring flange extending outwardly from the outer portion thereof, a shaft extending centrally through said disk-like portion, a plate secured to said shaft engaging the rear side of said wheel, a holding disk surrounding and secured to said shaft and engaging the front of said disk-like portion, said plate having an annular flange extending around the outer periphery of said wheel at the rear portion thereof and cooperating with said disk to hold broken segments of said wheel from being projected outwardly.

4. A grinding wheel having a central flat portion and a flaring annular flange extending outwardly therefrom, said central portion having a bore therethrough, a shaft extending through said bore, a plate bored to receive said shaft and engaged by the rear side of said wheel, said plate having an annular flange thereon extending around the outer periphery of said wheel and spaced slightly therefrom, a holding disk secured to said shaft and engaging the front side of said plate-like portion over the major part of its area whereby should a segment of said wheel be broken it will be held from being centrifugally projected outwardly by said plate and disk.

5. A grinding wheel having a central plate-like portion and an annular flaring flange projecting outwardly therefrom to form a cup-shaped wheel, a supporting and holding means for said wheel including a disk engaging the major part of said front plate-like portion of said wheel and including a flange extending around the outer periphery of said wheel at the rear portion thereof and cooperating with said disk to prevent a segment of said wheel when broken from being projected outwardly.

FRANK O. HARRIS