Aug. 27, 1946. J. MADER 2,406,553

DISK MOUNTING

Filed Feb. 12, 1945 2 Sheets-Sheet 1

Fig. 1.

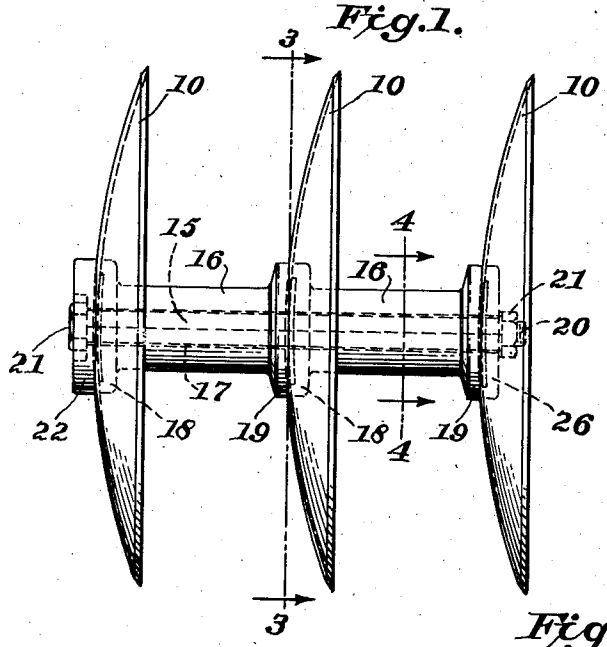


Fig. 2.

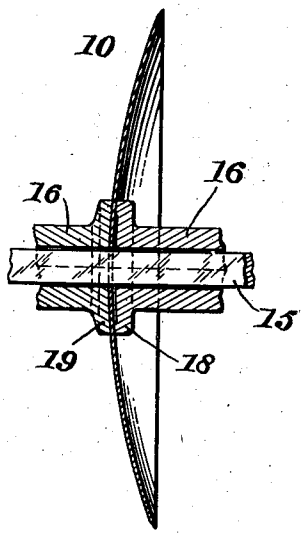


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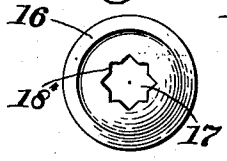


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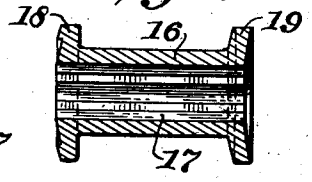


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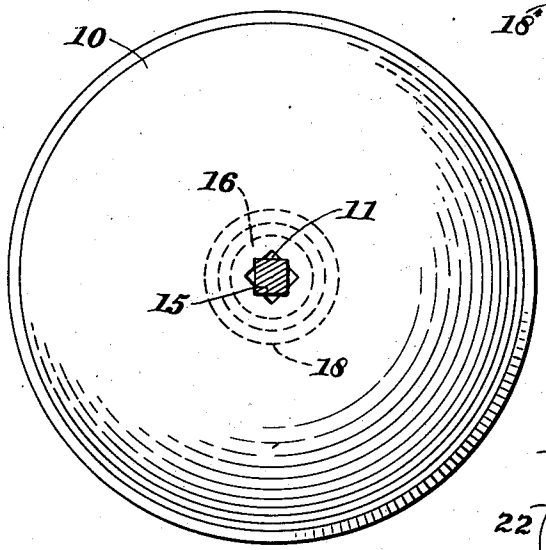


Fig. 4.

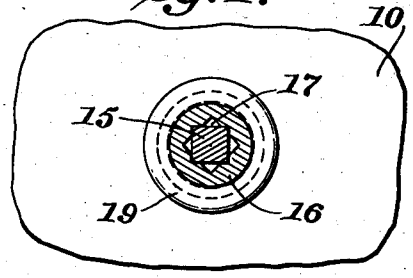


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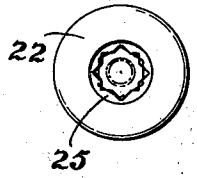


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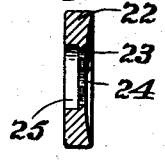


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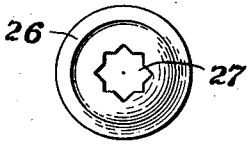
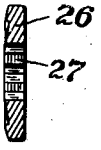


Fig. 10.



Inventor:
Joseph Mader,
By Cushman Darby & Cushman
Attorneys.

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Fig. 11.

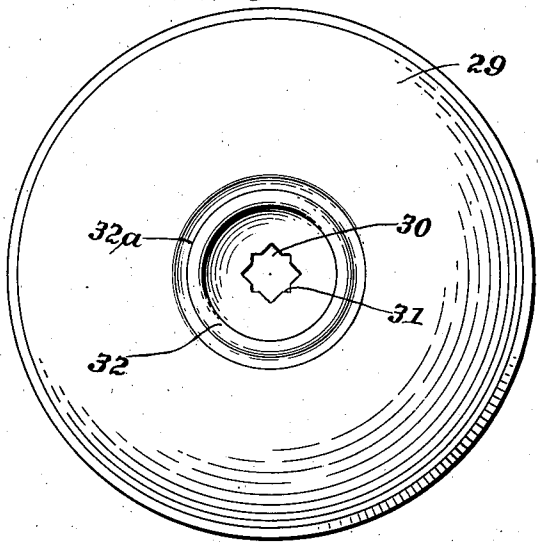


Fig. 12.

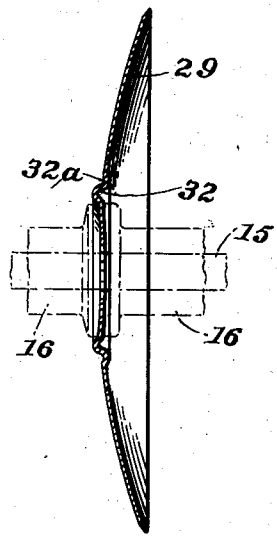


Fig. 13.

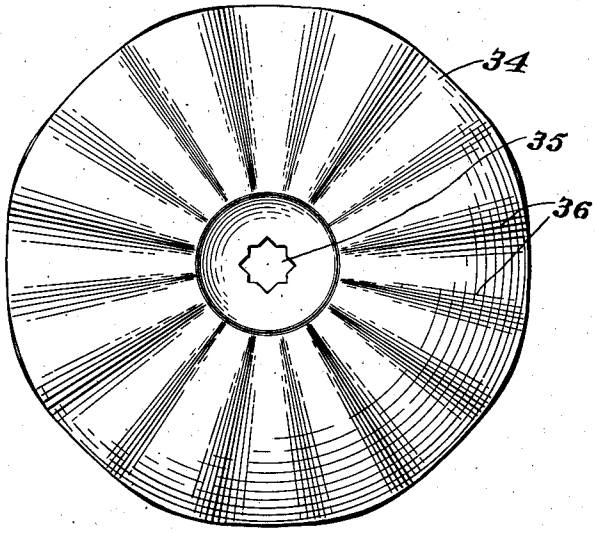


Fig. 14.

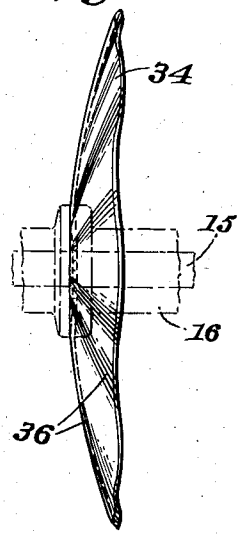


Fig. 15.

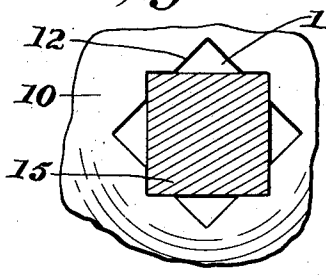
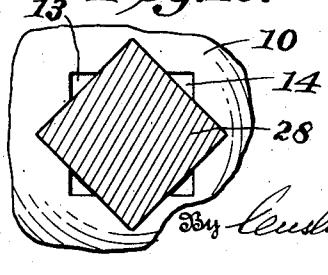


Fig. 16.



Inventor:

Joseph Mader,

By Cushman Darby & Cushman

Attorneys.

Patented Aug. 27, 1946

2,406,553
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UNITED STATES PATENT OFFICE

2,406,553

DISK MOUNTING

Joseph Mader, Chicago, Ill., assignor to Maremont Automotive Products, Inc., Chicago, Ill., a corporation of Illinois

Application February 12, 1945, Serial No. 577,420

3 Claims. (Cl. 97—217)

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The present invention relates to improved means for non-rotatably connecting a member such as a disk, wheel or the like to shafts of different sizes.

An important feature of the invention consists in providing a revoluble member such as a disk or the like with a central opening shaped to receive shafts of different sizes so that the revoluble member may be selectively and non-rotatably connected to either of two shafts.

A further feature of the invention consists in providing a mounting for disk harrows in which each disk is formed with a centrally disposed square opening for non-rotatably receiving a square shaped axle of the same size, and in which the sides of the squared opening are provided intermediate their ends with outwardly extending aligned grooves which form a substantially square socket of a different size than the square opening and are arranged to receive a square axle shaft of the same size as the socket, so that one or more disks may be conveniently fixed to axle shafts of different sizes at a minimum expenditure of time and effort.

Another object is to provide the center portion of a disk adjacent the shaft receiving opening with a reversed curve or annular groove for the purpose of imparting greater flexibility and preventing damage to the disk when in operation.

Other objects and advantages of the invention will become apparent from the following description when taken in conjunction with the accompanying claims and drawings.

Referring to the drawings in which I have shown several preferred embodiments of the invention:

Figure 1 is a side elevation of a disk harrow constructed in accordance with the present invention.

Figure 2 is a vertical sectional view through one of the disks shown in Figure 1.

Figure 3 is a sectional view taken substantially along the line 3—3 of Figure 1.

Figure 4 is a detailed sectional view taken substantially along the line 4—4 of Figure 1.

Figure 5 is an end view of one of the spacer sleeves.

Figure 6 is a longitudinal sectional view of a spacer sleeve.

Figure 7 is an end view of the left end washer shown in Figure 1 showing the opening in the washer in full lines and the normal position of one of the retaining nuts indicated in broken lines.

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Figure 8 is a vertical sectional view of the washer shown in Figure 7.

Figure 9 is an end view of the right end washer shown in Figure 1.

Figure 10 is a vertical sectional view of the washer shown in Figure 9.

Figure 11 is a front view of a modified form of disk.

Figure 12 is a vertical sectional view of Figure 11.

Figure 13 is a front view of a further modified form of disk.

Figure 14 is a vertical edge view of Figure 13.

Figure 15 is an enlarged detailed sectional view showing a disk connected to a small size shaft, and

Figure 16 is a view similar to Figure 15 showing the disk connected to a larger size shaft.

Heretofore in the mountings for disk harrows, the square openings in the disks for receiving the supporting shaft or axle were of uniform size and could only be used with a square shaft of the same size. In order to provide means whereby these disks may be detachably secured to square shafts of different sizes, each of the disks 10 of the harrow (Fig. 1) is formed with a substantially square opening 11 (Fig. 15) and each of the sides 12 of the opening intermediate its ends has aligned outwardly disposed V-shaped grooves or recesses 13 which form a square socket 14 of smaller size than the square opening 11. For the purpose of illustration, three transversely curved disks 10 are shown mounted on a square shaft 15 which is substantially the same size as the smaller square socket 14 so that the corners of the shaft interlock with the aligned grooves 13 to positively and non-rotatably connect the disks to the shaft. The disks 10 are uniformly spaced on the shaft 15 by the sleeves or spools 16 each of which is formed with a central square opening 17 similar in construction and size to the opening 11 in the disk, and outwardly extending aligned grooves 18' which register with and are of the same size as the grooves 13. One end of the sleeve 16 such as 18 is convex so as to bear against the concave portion of the adjacent disk while the opposite end 19 is concave to contact with the complementary curved portion of its adjacent disk. The ends of the shaft 15 are threaded as at 20 to receive the retaining nuts 21. A washer 22 having a curved inner face 23 and a central opening 24 similar in shape to the opening 11 and the socket 14, is arranged to be clamped against the outer left-hand disk 10 by one of the nuts 21. Preferably the outer end of the opening 24 ter-

minates in a recess 25 for receiving the nut 21. A washer 26 has a similar shaped central opening 27 and is held against the concave portion of the adjacent disk 10 by the other nut so that when the parts are set up, the disks are maintained firmly in locked position on the shaft 15. In the event it is desired to use the disks 10 with a different size harrow shaft, this can conveniently be done upon dismantling the disks from the shaft 14 and connecting them to the larger size square shaft 28 (Fig. 16). It will be noted that the shaft 28 is substantially the same size as the square openings 11 in the disks and the openings 17 in the sleeves 16, so as to snugly fit into and engage these openings in order to lock the shaft to the disks and the sleeves. While the improved form of opening has been shown associated with a harrow disk, it will be manifest that the same may with equal efficiency be used for connecting one or more rotatable members to shafts, axles or the like, of different sizes and at a minimum expenditure of time and effort.

In the modification shown in Figure 11, the curved disk 29 is provided with a square opening 30, the sides of which intermediate their ends are formed with oppositely aligned grooves 31 so that the disk may receive shafts of different sizes. The disk adjacent the central opening 30 has a reversed curved or annular V-shaped groove 32 on one side and an outwardly spaced V-shaped annular groove 32*a* on its opposite side. These grooves are concentric with the disk and the groove 32*a* diminishes progressively towards the outer periphery thereof. This arrangement of the grooves imparts greater flexibility and also guards against fracture or damage of the disk during operation.

In the modification shown in Figure 13, the disk 34 has a central opening 35 shaped to receive shafts of different sizes and may be reinforced by radial corrugations 36 which preferably extend from a point adjacent the central opening to the outer periphery of the disk.

It will be seen that by reason of the particular configuration of the central opening in the disk, that simple, efficient and positive means are provided for connecting either a single disk or a plurality of disks to shafts or the like of different sizes. Thus, the invention is admirably suited for use with disk harrows since not infrequently the manufacturers of such devices provide a ⅞" square shaft for a 16" disk while others use a 1" square shaft for the same size of disk. By arranging the central opening in the disk so as to accommodate a shaft of either size, the same disk can be conveniently connected to a large or small size shaft and thus eliminate the necessity of providing separate disks for each size of shaft.

It will be understood that the forms of the invention shown and described are merely illustrative of preferred embodiments and that such changes may be made as fall within the purview of one skilled in the art without departing from the spirit of the invention and scope of the claims.

I claim:

1. A harrow having a shaft, a plurality of spaced harrow disks carried thereby, spacer members on said shaft for spacing said disks, said disks and spacer members having openings receiving the shaft, said spacer members having means engaging said disks on opposite sides thereof, the walls of the disk openings engaging the shaft to fix the disks thereto for rotary movement, and the walls of said disk openings also having a configuration for mounting on a different sized shaft of greater or less cross section to hold said disks fixed thereon.

2. A harrow having a shaft, a plurality of spaced harrow disks carried thereby, spacer members on said shaft for spacing said disks, said disks and spacer members having openings receiving the shaft, the walls of said openings engaging the shaft to fix the disks and spacers thereto for rotary movement together, and the walls of said openings also having a configuration for mounting on a different sized shaft of greater or less cross section to hold the said disks and spacers fixed thereon.

3. A harrow having a shaft which is polygonal in cross section, a plurality of spaced harrow disks carried thereby, spacer members on said shaft for spacing said disks, said disks and spacer members having polygonal openings receiving the shaft, the walls of said openings engaging the shaft to fix the disks and spacers thereto for rotary movement together, and the walls of said openings also having a configuration for mounting on a different sized shaft of greater or less cross section to hold the said disks and spacers fixed thereon.

JOSEPH MADER.