

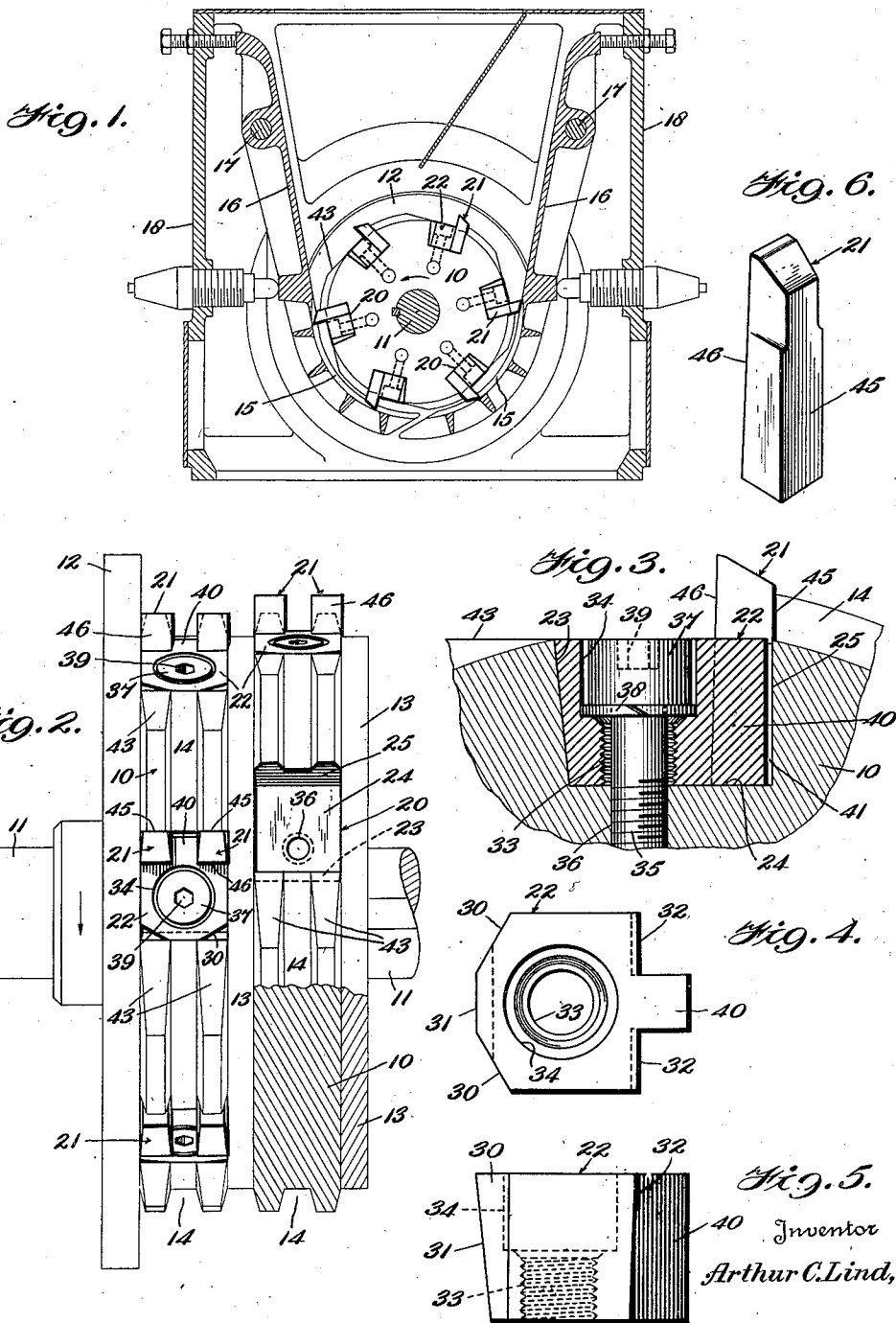
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A. C. LIND

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CUTTER BLADE HOLDER FOR TRITURATORS

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Inventor  
Arthur C. Lind,

G. R. Collins,  
Attorney

334

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CUTTER BLADE HOLDER FOR  
TRITURATORS

Arthur C. Lind, Milwaukee, Wis., assignor to  
Chain Belt Company, Milwaukee, Wis., a cor-  
poration of Wisconsin

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This invention relates to a cutting blade and holder therefor adapted to be used with a rotary cutter or triturator of the type shown in U. S. Patent 2,122,965, issued July 5, 1938, on an application filed by Eskil W. Swenson, and U. S. Patent 2,131,689, issued September 27, 1938, on an application filed by William B. Marshall.

The triturating apparatus disclosed in each of the said patents includes a rotor composed of a plurality of discs mounted on a rotating shaft, each disc carrying a number of circumferentially spaced cutter blades which co-operate with grid members to shred and shear soft solids and semi-solids contained in refuse or other matter. As described in said patents, the disc members have medially located circumferential grooves aligned with ribs on the grid members, and the cutter blades carried by the discs extend beyond the periphery of the latter to be accommodated in corresponding grooves in the grids. Each blade is retained by a set screw, the head of which is contained in a recessed portion of the disc body removed from the cutter blade, while the blade itself is cut away at the point the screw engages it to prevent the blade from being displaced should the screw become loosened.

It is an object of the present invention to provide an improved form of cutter blade and holder which, when used in machines of this type will more effectively prevent the blades from becoming disengaged during the high speeds at which the machines are operated.

A further object of the invention is to provide a single blade holder which will securely lock a plurality of cutter blades in their desired position, said holder not only preventing the blades from being displaced radially by centrifugal force, but also laterally along the axis of rotation.

Another object of the invention is to provide a blade holder for the purposes described which may be readily removed from the disc body when the blades require replacement or re-grinding.

With the above and other objects in view which will appear as the description proceeds, the invention consists in the novel details of construction and combinations of parts, as hereinafter described and particularly pointed out in the appended claims.

Reference is now made to the accompanying drawing, in which like reference characters designate like parts throughout, and in which:

Figure 1 is a transverse sectional view of a triturator of the type above mentioned, showing the position of the cutter members with respect to the rotor and the shredder grates;

Fig. 2 is an enlarged fragmentary elevational view, partly in section, of the rotor shown in Fig. 1, as viewed from the left of said figure;

Fig. 3 is an enlarged detail sectional view through one of the blade holders and a portion of a rotor disc;

Fig. 4 is a plan view of a cutter blade holder;

Fig. 5 is a side elevational view of the cutter blade holder illustrated in Fig. 4; and

Fig. 6 is a perspective view of one of the cutter blades made in accordance with this invention.

Referring more particularly to Figs. 1 and 2 the triturating apparatus includes a rotor comprising a plurality of discs 10 keyed to a shaft 11 between end plates 12 and having spacing plates 13 interposed between adjacent discs. Each disc 10 has a medial circumferential groove 14 in its periphery, which grooves upon assembly align with complementary ribs 15 formed on the curved lower portions of the grid members 16, which members are pendulously hung on pins 17 carried by the triturator housing 18 for co-operation with the rotor in the manner fully described in the aforesaid Swenson and Marshall patents.

The peripheries of the discs 10 are recessed, as indicated at 20, at a plurality of circumferentially spaced points for the reception of the cutter blades 21 and the blade holders 22. The said recesses extend completely through the discs in an axial direction, and their forward wall 23, considered with respect to the normal direction of rotation of the rotor, is preferably approximately radial as regards the rotor axis. The bottom wall 24 forms an obtuse angle with said forward wall 23 and may be at right angles to a radial plane which is angularly removed from that of said forward wall by from 5° to 10°. The rearward wall 25 of the recesses is preferably perpendicular to said bottom wall, as clearly shown in Fig. 3. The recesses should be deep enough to enable the top of the cutter holders 22 to clear the ribs 15 of the grids 16, and in Figs. 1 and 3 the top of the holders is illustrated as being approximately flush with the bottom of the grooves 14.

Two cutter blades 21 are mounted in axially spaced relation in each recess, with their rear faces abutting the rear wall of the recess, and are effectively retained in place by the holders 22. As will be clear from Fig. 4, these holders are generally rectangular in plan, although the forward corners may be beveled, as indicated at 30, to limit the area of contact between the front face 31 and the front wall 23 of the recess 20. The said front face 31 of the holder is inclined

complementarily to the wall 23, as clearly shown in Figs. 3 and 5, to provide a wedging action as the holder is seated which causes it to force the rear face 45 of the cutters 21 tightly against the rear wall 25 of recess 20, as will be readily understood. The rear face 32 of the holder is also slightly inclined or tapered in a direction opposite to that of face 31, while the front face 46 of the cutters 21 is complementarily inclined or tapered, thus securing a further wedging action between the holder and cutters themselves. Since the cutters taper outwardly from their base to the cutting end, they will be prevented from flying out of the recesses under the action of centrifugal force even though the holder should become slightly loosened in the recess.

The holders 22 are provided with a bore 33 which is threaded for engagement with the threaded stem of a removing implement or tool, not shown. The holders are further counter-bored, as at 34, and securing screws or bolts 35, of smaller diameter than the bore 33 so as not to engage the threads thereof, pass through the said bores and are threaded into apertures 36 in the disc 10, as clearly illustrated in Fig. 3. The enlarged heads 37 of the screws 35 occupy the counterbores 34, and are preferably flush with the outer face of the holders 22; and lock washers 38 may be interposed between the said heads and the shoulders formed by the bottom of the counterbores 34. The said heads may also be provided with sockets 39 or other suitable means for the reception of a wrench or tool whereby the screws may be entered into and removed from the holes 36.

The holders 22 are further provided with a medial lug or projection 40 extending rearwardly from the rear face 32, and in the assembled position these projections align with the grooves 14 of the rotor discs 10, extending between the pair of cutters 21 and, in conjunction with the end faces of the spacing plates 13, preventing axial displacement of the cutters. The said projections are of such length as to leave a clearance 41 between their rear faces and the rear wall 25 of the recesses 20, thereby insuring forcible contact between the rear face 32 of the holders and the front face 46 of the cutters, and between the rear face 45 of the cutters and the rear wall 25 of the recesses.

The outer peripheries of the rotor discs 10 are preferably milled off in advance of each recess 20 to a plane tangent to the bottom of the grooves 14 to provide flat surfaces 43 flush with the outer surfaces of the holders 22.

With the construction above described, as the screws 35 are tightened, the holders 22 are drawn into the recesses 20, with their inclined forward faces 31 engaging the inclined forward walls 23 of the recesses, thus wedging the cutters 21 between the oppositely inclined rear faces 32 of the holders and the rear walls 25 of the recesses, whereby the cutters are securely held in their desired positions. It will be noted that the holders 22 are free to move rearwardly under the wedging action of the faces 31 and 23, due to the stems and heads of the screws 35 being of smaller diameter than the bores 33 and counterbores 34 respectively of the holders. The spacing plates 13, or the end plates 12, together with the projections 40 prevent axial movement of the cutter blades.

It should be observed that the taper on the face 32 of the holder and on the face 45 of the

blade need be relatively slight, say from 1° to 3°, to prevent displacement of the parts relative to each other, whereas the taper of the forward face 31 of the holder and of the forward wall 23 of the recess is considerably greater, in order that positive forcing action may be applied to lock the blades against the rear recess wall 25 contacting the rearward face of the blades. By cutting away the end portions of the face 31 at at 30, substantially three point contact is maintained against the disc, insuring equal pressure on both blades while retained in locked position.

To remove the cutter blades 21, the screw 35 is first withdrawn and a threaded tool is then inserted in the counterbore 34 and engaged with the threaded bore 33. When firm engagement is secured, the holder 22 may be readily withdrawn from the recess 20 and the cutter blades removed for grinding or renewal.

While one form of the invention has been illustrated and described it is obvious that those skilled in the art may vary the details of construction as well as the precise arrangement of parts without departing from the spirit of the invention and therefore it is not wished to be limited to the above disclosure except as may be required by the claims.

What is claimed is:

1. In a rotary cutter of the class described, a rotatable cutter member having an outwardly extending wall adjacent its periphery; a pair of axially spaced outwardly tapering cutter blades extending beyond the periphery of said member, each having a face contacting said wall; a blade holder having a spacing element disposed between said blades arranged to maintain them in axially spaced relation, said holder also having a face engaging the face of each blade which is opposite that engaging the wall of said member; and means for causing wedging engagement between said holder, blades and member wall.

2. In a rotary cutter of the class described, a rotatable cutter member having an outwardly extending wall adjacent its periphery; a pair of axially spaced cutter blades extending beyond the periphery of said member, each having a rear face contacting said wall and a forward face tapering outwardly from the base of the blade; a blade holder having a spacing element disposed between said blades to maintain them in axially spaced relation, said holder also having a rear face tapered complementarily to and engaging with said forward face of each blade; and means for causing wedging engagement between said holder, blades and member wall.

3. In a rotary cutter of the class described, a rotatable cutter member having axially disposed inwardly converging forward and rear walls adjacent its periphery; a pair of axially spaced cutter blades extending beyond the periphery of said member, each having a rear face engaging said rear wall and a forward face tapering outwardly from the base of the blade; a cutter holder having a spacing element extending circumferentially between said blades to maintain them in axially spaced relation, said holder also having a rear face tapered complementarily to and engaging with said forward face of each blade, and a forward face tapered complementarily to and engaging with said forward wall; and means for removably holding said blade holder in wedging engagement with said forward wall and blades.

4. In a rotary cutter of the class described, a rotatable cutter member having a recess formed in its periphery providing axially disposed in-

wardly converging forward and rear walls; a pair of axially spaced cutter blades positioned in said recess, each having a rear face engaging said rear wall and a forward face tapering outwardly from the base of the blade; a cutter holder disposed in said recess forwardly of said blades, provided with a spacing element extending rearwardly between the blades to maintain them in axially spaced relation, said holder also having a rear face tapered complementarily to and engaging with said forward face of each blade, and a forward face tapered complementarily to and engaging with said forward wall of the recess; and threaded means for drawing said holder into wedging engagement with said forward wall and blades, and removably retaining it in said engagement.

5. In a rotary cutter of the class described, a rotatable cutter member having a recess formed in its periphery providing axially disposed inwardly converging forward and rear walls; a pair of axially spaced cutter blades positioned in said recess, each having a rear face engaging said rear wall and a forward face tapering outwardly from the base of the blade; a cutter holder disposed in said recess forwardly of said blades, provided with a spacing element extending rearwardly between the blades to maintain them in axially spaced relation, said holder also having a rear face tapered complementarily to and engaging with said forward face of each blade, and a for-

ward face tapered complementarily to and engaging with said forward wall of the recess; and threaded means for drawing said holder into wedging engagement with said forward wall and blades, and removably retaining it in said engagement, said holder being circumferentially shiftable in said recess relative to said threaded means as the latter draws it home.

6. A blade holder for retaining a plurality of cutter blades, in axially spaced relationship, in a recess of substantially trapezoidal cross section formed in the perimetral portion of a triturator rotor, the non-parallel walls of which recess converge inwardly in the direction of the rotor axis, and each of said blades having a pair of opposed inwardly-divergent faces, one of which is engageable with one of said inwardly-convergent walls of the rotor recess, said holder comprising a block-like member having a body portion provided with a pair of opposed faces also convergent inwardly in the direction of the rotor axis, one of which is engageable with the other of the said convergent walls of the recess, and the other of which holder faces is engageable with the other inwardly-divergent faces of the cutter blades, said body portion also having a projection of less width than the body extending from its last mentioned face intermediate its ends, for positioning between the cutter blades to maintain them in said axially spaced relationship.

ARTHUR C. LIND.