Feb. 27, 1945. G. R. WALDECK 2,370,430

CUTTER HEAD FOR HYDRAULIC DREDGES

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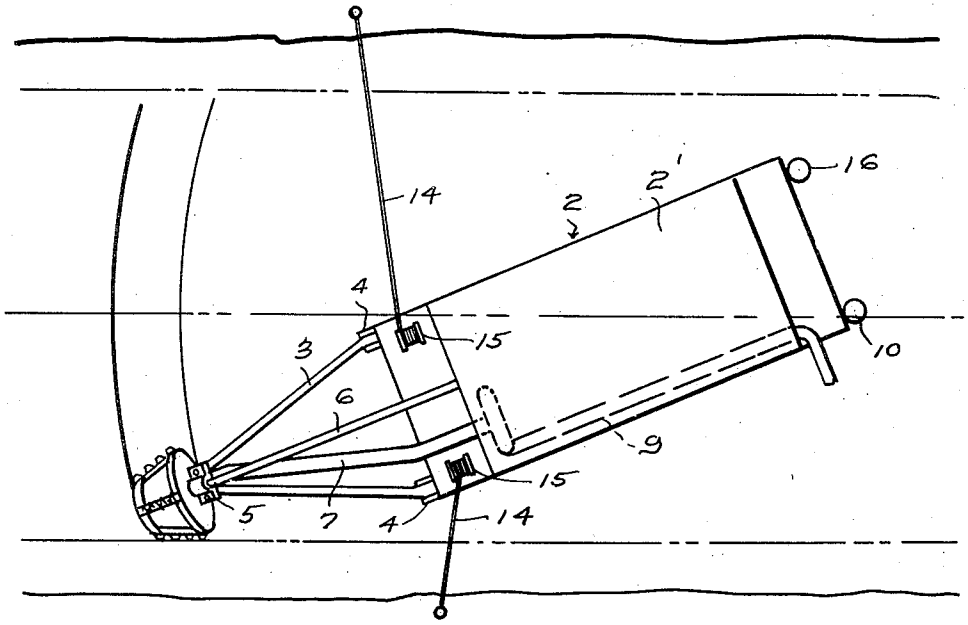


Fig. 1.

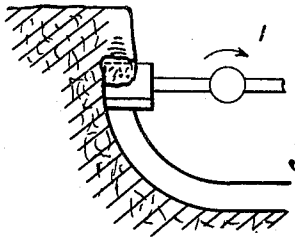


Fig. 9.

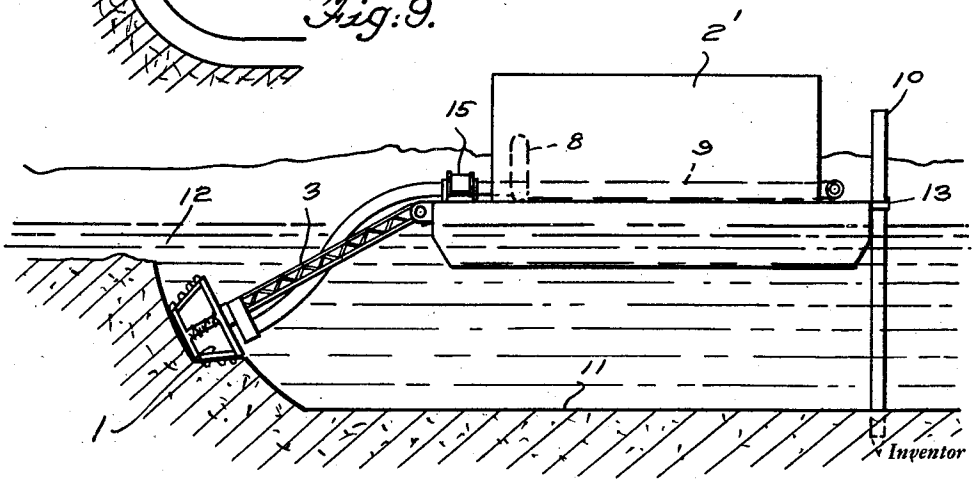


Fig. 2.

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CUTTER HEAD FOR HYDRAULIC DREDGES

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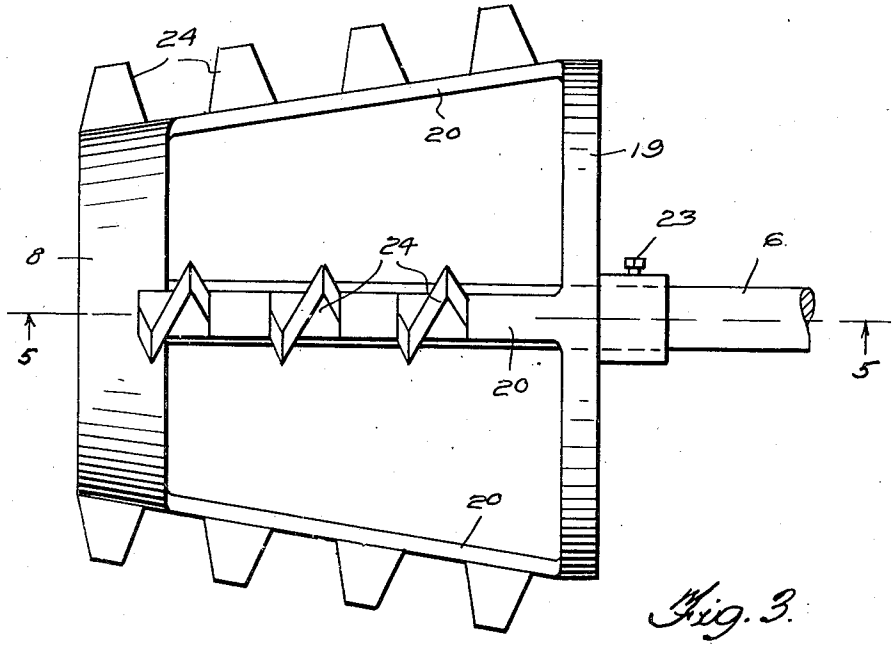


Fig. 3.

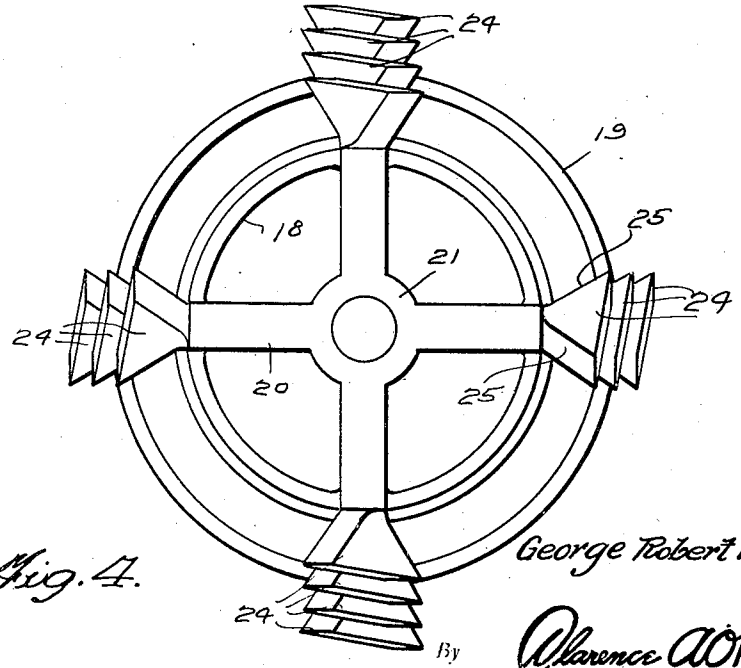


Fig. 4.

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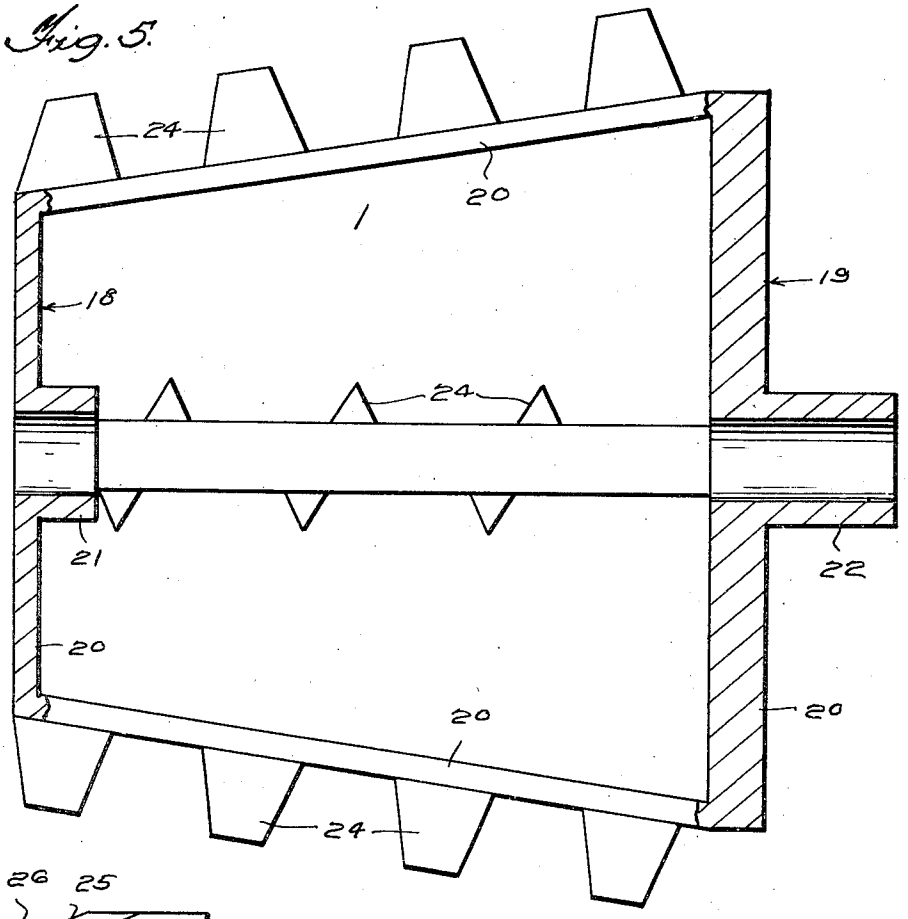
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Feb. 27, 1945. G. R. WALDECK 2,370,430

CUTTER HEAD FOR HYDRAULIC DREDGES

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Fig. 5.



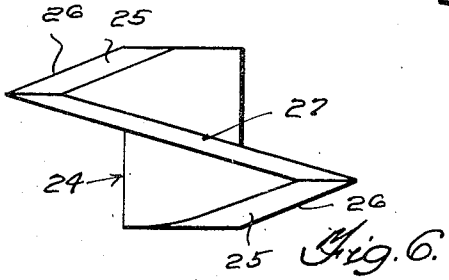


Fig. 6.

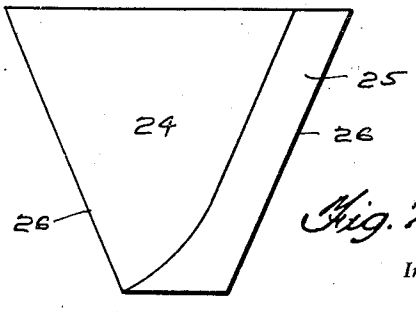


Fig. 7.

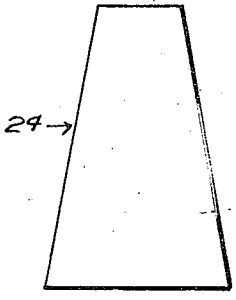


Fig. 8.

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Patented Feb. 27, 1945 2,370,430

UNITED STATES PATENT OFFICE

2,370,430

CUTTER HEAD FOR HYDRAULIC DREDGES

George Robert Waldeck, Auburn, Ala., assignor of twenty-five per cent to George A. Waldeck

Application February 17, 1943, Serial No. 476,225

2 Claims. (Cl. 37—67)

My invention relates to hydraulic suction dredges, and more particularly to cutter heads therefor.

The principal object of the invention is to equip such dredges with a simply constructed, strong, rotary cutter head operative in opposite directions, respectively, to cut any type of bottom, mud, gravel, rock and the like, and which is quick acting, adapted for prolonged use, and inexpensive to manufacture, and service.

Other and subordinate objects are also comprehended by my invention, all of which, together with the precise nature of my improvements, will be readily understood when the succeeding description and claims are read with reference to the drawings accompanying and forming part of this specification.

In said drawings:

Figure 1 is a view in top plan illustrating my improved cutter head applied,

Figure 2 is a view in transverse section with parts in side elevation,

Figure 3 is a view in side elevation of the cutter head drawn to an enlarged scale,

Figure 4 is a view in front end elevation,

Figure 5 is a view in longitudinal section taken on the line 5—5 of Figure 3,

Figure 6 is a view in top plan of one of the cutter teeth,

Figure 7 is a view in front elevation of said tooth,

Figure 8 is a view in edge elevation of the tooth, and

Figure 9 is a diagrammatic view illustrating the novel manner in which my improved cutter head operates.

Referring to the drawings by numerals, the cutter head 1 of my invention has been shown therein, to clearly illustrate its operation and use, as embodied in a hydraulic suction dredge 2 conventionally illustrated as sufficient for the present purposes and comprising a hull 2', a beam, or ladder, 3 pivotally mounted, as at 4, on the bow of the hull 2' for vertical swinging movement and supporting, in a bearing 5, at its front end, the usual vertically swingable, rotary and reversible drive shaft 6 upon the forward end of which the cutter head 1 is fixed. The numeral 7 designates the usual suction line from the head 1 to the pump 8 and the numeral 9 the discharge line. As is well known, such dredges are swung from side to side to move the cutter head correspondingly and about an upright spud 10 driven into the bottom 11 of the stream 12 and to which one corner of the stern of the hull 2' is swingably connected, as at 13. A pair of cables 14 suitably anchored at opposite sides of the bow of the hull 2' and connected to reels 15 on said bow provide for swinging the hull 2' as desired. Also located at the stern of the hull 2' is a walking spud 16, similar to the spud 10, but at the opposite corner of the stern and to which the hull 2' is swingably connected in the same manner as to the spud 13. In advancing the dredge into a new bank, the walking spud 16 is lowered and driven into the bottom while the dredge is swung to the side opposite to that on which said spud is located. The spud 10 is then pulled up and the dredge swung toward the opposite side about the walking spud 16 to advance the same in a manner which will be clear. The walking spud 16 is then pulled up out of the bottom 11 and the spud 10 redriven in a forward location for swinging of the hull 2' about the same in its advanced position thus achieved.

My improved cutter head comprises a forwardly tapering, spider or skeleton drum consisting of a circular, circumferentially flat, front end spider member 18, a circular rear end spider member 19, forwardly converging, flat bars 20 connecting said end members and arranged in 90 degree angular relation around the same. The members 18, 19 are provided with hubs 21, 22 for attachment to the shaft 6 by set screws, as at 23. Longitudinal rows of cutter or digger teeth 24 are provided on the flat bars 20 of the drum in line with the longitudinal center of the bars 20, the teeth in alternate rows being staggered relative to those in intervening rows, and alternate rows extending to the front edge of the front end spider member 18 which teeth are rigidly secured.

The teeth 24 are provided with sides or edges 25 which connect the ends of the base to the ends of the obliquely arranged tips, whereby cutting edges 26 are provided extending to opposite sides of an axial plane through said bar, the base of each tooth extending generally longitudinally of said bar, see Figures 4 and 6.

Referring now to Figure 9, it will be manifest that under swinging of the dredge, or in other words the cutter head 1, to the starboard side, and rotation of the cutter head 1 clockwise, all as viewed from the front of the dredge, the cuting edges 26 on the sides 25 on one side of the teeth 24 will cut with an upward, undercutting action and obliquely of the axis of rotation of the head. Also, under swinging of the dredge, or head 1, to the port side, and reversal of the head 1 to rotate counter-clockwise, the cutting edges 26 and sides 25 on the opposite sides of the teeth 24 will function in a like manner. Also, in either direc-

tion of rotation of the teeth 24, the diagonal outer edges 27 function as auxiliary cutting and digging devices oblique to the direction of rotation to facilitate their effective operation.

It will be noted, however, that by virtue of the diagonal pitch of the outer or transverse cutting edges thereof, the teeth 24 cut with a cleaving action.

The foregoing will, it is believed, suffice to impart a clear understanding of my invention without further explanation.

Manifestly, the invention, as described, is susceptible of modification without departing from the inventive concept, and right is herein reserved to such modifications as fall within the scope of the appended claims.

What I claim is:

1. As a rotary cutting head for dredging, a longitudinally tapering skeleton drum consisting of a flat circular front member, a larger flat circular rear member, a hub on each front and rear member, and a plurality of straight flat bars connecting said front and rear members, forming the sides of the tapering drum, and equally spaced circumferentially thereof, and a straight row of rigidly fixed alike warped cutting teeth on each of said bars along their center lines, each of said teeth having its base portion extending generally longitudinally of said bar and the outer tip portion arranged obliquely thereto, whereby to provide cutting edges to opposite sides of an axial plane through said bar.

2. As a rotary cutting head for dredging, a longitudinally tapering skeleton drum consisting of a flat circular front member, a larger flat circular rear member, a hub on each front and rear member, and a plurality of straight flat bars connecting said front and rear members, forming the sides of the tapering drum, and equally spaced circumferentially thereof, and a straight row of rigidly fixed alike warped cutting teeth on each of said bars along their center lines, each of said teeth having its base portion extending generally longitudinally of said bar and the outer tip portion arranged obliquely thereto, whereby to provide cutting edges to opposite sides of an axial plane through said bar the outer edges of the teeth being situated in the conical surface of the head.

GEORGE ROBERT WALDECK.