Aug. 27, 1946. G. E. KARL 2,406,500

HOE WHEEL PLATE STAMPING

Filed Dec. 4, 1944 2 Sheets-Sheet 1

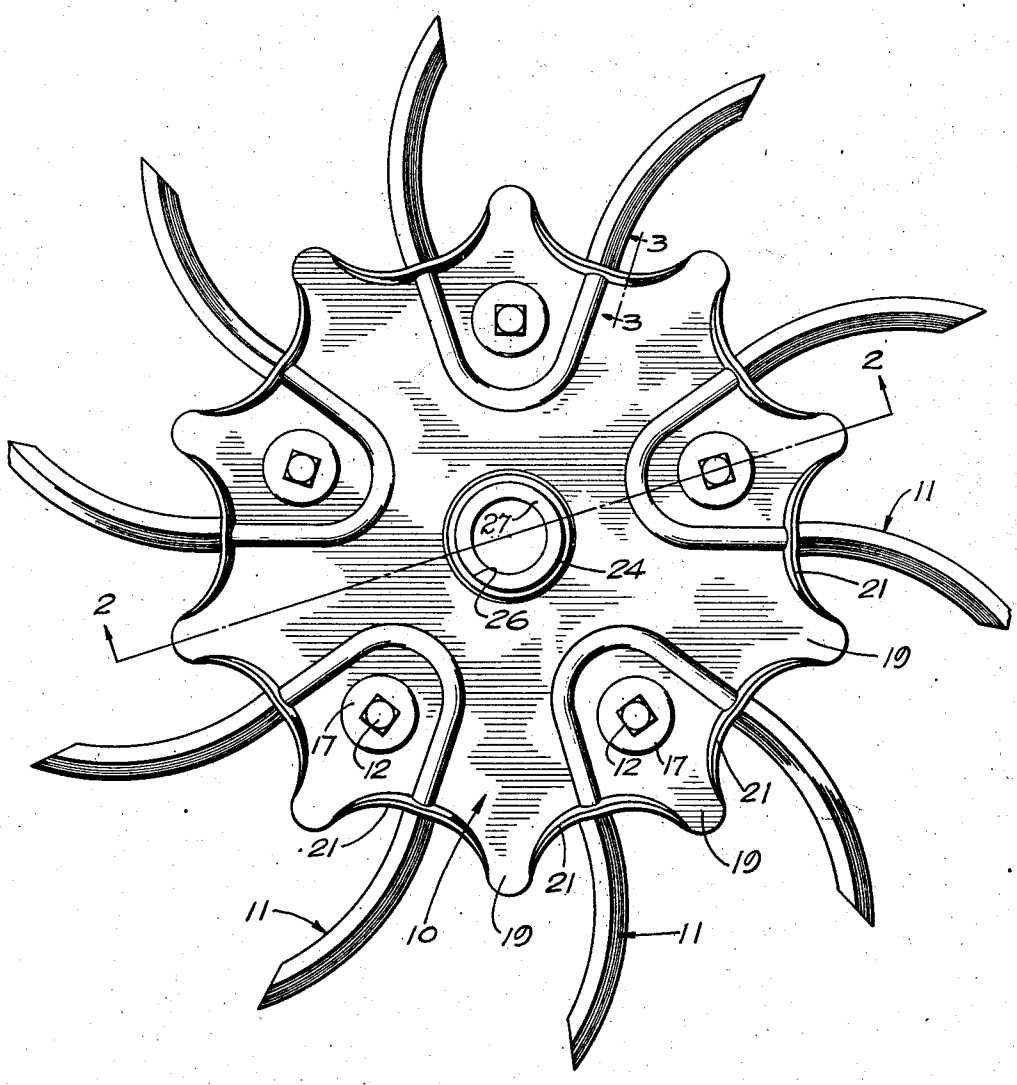

Fig. 1

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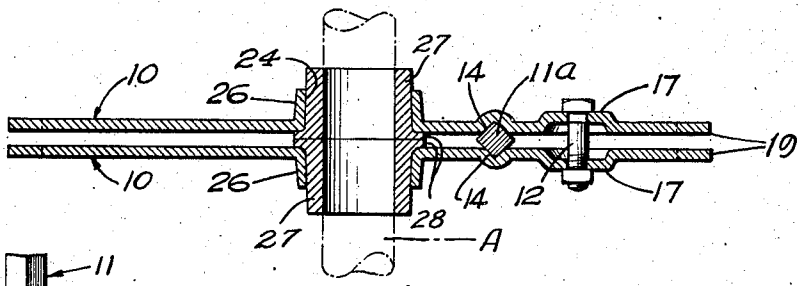

Fig. 2

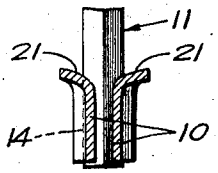

Fig. 3

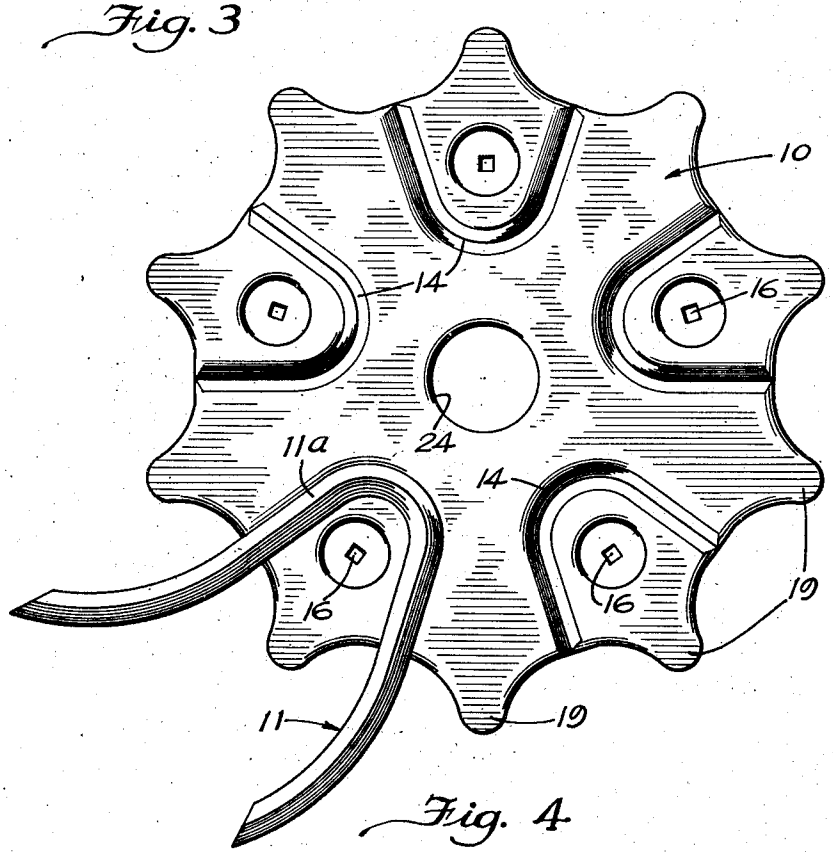

Fig. 4

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HOE WHEEL PLATE STAMPING

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2 Claims. (Cl. 97—216)

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This invention relates to farm implements of the rotary hoe type especially suitable for use in breaking up, loosening and cultivating the soil. Implements of this general type are usually made up of a plurality of toothed wheels, disposed in suitably spaced apart relationship to each other, depending on the particular use of the implement or the character of the soil in which it is to operate. More particularly, the present invention is directed to improvements in toothed wheels of rotary hoes in which the wheels are provided with removable and replaceable teeth of the double pronged type having an anchorage portion of generally U-shaped formation.

Wheels of rotary hoes as heretofore produced, include two plates or disc-like elements between which the pronged teeth are rigidly anchored, and these plates are formed as castings. As is well known, castings possess the undesirable characteristic of being fragile, and may readily break under severe stress or strain when subjected to rugged usage. Rotary hoe wheels heretofore made with cast plates are relatively heavy and furthermore when the pronged teeth are mounted in place therebetween, great care must be exercised to avoid the possibility of imposing excessive strain in tightening the bolts so as to avoid possibility of fracture or breakage of either or both of the plates.

One of the objects of this invention is to provide an improved toothed wheel of a rotary hoe, characterized by the provision of a relatively light weight durable construction which permits effecting a substantial reduction in cost of manufacture.

Another object is to provide an improved toothed wheel of a rotary hoe wherein said wheel comprises a pair of stamped sheet metal plates, constructed and arranged to rigidly support therebetween a plurality of circumferentially spaced apart, outwardly projecting, double pronged teeth and providing a rugged and durable construction capable of withstanding severe usage.

With these and other objects in view my invention consists in the construction, arrangement and combination of the various parts of my device whereby the objects contemplated are attained as hereinafter more fully set forth, pointed out in the claims and illustrated in the accompanying drawings, wherein:

Figure 1 is a plan view of the improved wheel of a rotary hoe, embodying the present invention.

Figure 2 is a transverse section through the

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wheel, taken substantially as indicated at line 2—2 on Figure 1.

Figure 3 is a fragmentary sectional view through the outer marginal portion of the wheel, taken substantially as indicated at line 3—3 on Figure 1.

Figure 4 is an inner face view of one of the plates of the wheel and showing one of the double pronged teeth seated in position on the plate.

In implements of the type embodying the present invention it is the usual practice to utilize a plurality of individual toothed wheels, mounted loosely in a desired spaced apart relation on a shaft, to constitute a single unit. For certain uses more than one unit consisting of a desired number of individual wheels may be employed, and if desired the wheels of one unit may be disposed in overlapping or offset relation to the wheels of an adjacent unit.

The wheel embodying the present invention, as represented in the drawings, includes two identical plates 10, of generally circular contour, adapted to be disposed in cooperating relation for embracing therebetween a plurality of circumferentially spaced apart, outwardly projecting double pronged teeth 11. The teeth each include a generally U-shaped anchorage portion 11*a*, adapted to be firmly and rigidly clamped in position between the plates when the latter are fixedly connected together by a plurality of circumferentially spaced apart bolts 12.

Each of said plates is formed as a unitary sheet metal stamping, and the inner face of each plate as clearly seen in Figure 4 of the drawings, is formed with a plurality of circumferentially spaced apart, outwardly opening, U-shaped grooves 14 which constitute mounting seats for the anchorage portions 11*a* of the double pronged teeth 11. The grooves 14, as may be clearly seen in Figure 2, are substantially V-shape in cross section and the grooves of the two cooperating plates are adapted to be aligned with each other and form complementary seats for opposite sides of the anchorage portions 11*a* of the double pronged teeth. When the cross section of metal of the legs of the anchorage portion is of diamond shape, such as seen in Figure 2, the opposite corners of the legs are adapted to seat firmly and snugly in the grooves 14. Said grooves are of such contour, however, as to readily accommodate teeth of various cross sectional forms, such as circular, oval, etc.

The plates are each formed with correspondingly positioned apertures 16, for accommodation of the bolts 12, and said apertures are preferably

located within the areas encompassed by the grooves 14, as may be seen in Figure 4. Surrounding each of the apertures 16, on the outer face of each plate, is an outwardly projecting boss 17, providing seats for the heads or the nuts of the bolts, to provide maximum convenience in applying or removing the bolts and serving to strengthen and stiffen the plates to reduce the possibility of spring of the plates when they are assembled and the bolts are tightened. When the two plates 10 are assembled together, with the teeth 11 interposed therebetween, the assembly is then rigidly connected together by means of the bolts 12. The teeth 11 are thus rigidly affixed with respect to the two plates.

It will be apparent that if it becomes necessary to replace one or more of the teeth of the assembled wheel, it merely requires the removal of the bolts 12 to separate the plates and permit such replacement.

Extending outwardly from the outer marginal portion of each of the plates, are a plurality of circumferentially spaced apart, tapered projections 19, located in such relation so as to be disposed between each of a pair of adjacent legs of the teeth 11. When the plates are assembled together with the projections disposed in alignment, each set of projections function as stone eliminators to preclude wedging of stones or other objects between adjacent prongs of the teeth which might result in deformation of the teeth.

The marginal portion of each of the plates, intermediate adjacent projections 19, is formed with a laterally projecting flange portion 21. As may be seen in Figure 1, these flange portions extend at opposite ends for a substantial portion of the length of the sides of each of the two adjacent projections 19. Said flanges serve to reinforce the plates and the stone eliminator projections 19, and also provide a shoulder tending to preclude penetration of the wheel assembly to an excessive depth in soft or loose soil. As may be clearly seen in Figure 3 of the drawings, the lateral offset of the metal, which results from the formation of the grooves 14, merges at the outer ends into the laterally projecting flanges 21.

Each of the plates 10 is formed with a central aperture 24, surrounded by a laterally projecting annular flange 26. Press fitted into the aperture 24 of the annular flange 26, of each plate 10, is a hub member 27, having a flange 28, seated tightly against the inner face of said plate. The flanges 28 of both hub members are of such thickness that when the plates 10 are bolted together, as above described, the outer faces of the flanges 28 are disposed in abutting relation, as seen in Figure 2, and the two hub members thus serve as a bearing hub for mounting of the wheel on a shaft, as indicated in dot and dash outline at A in Figure 2 of the drawings.

It will be apparent that by virtue of the novel construction embodying the present invention, in addition to obtaining the advantages of quick and easy replacement of damaged or worn teeth, the wheel per se is of relatively light weight, low in manufacturing cost, and possesses the important advantage of increased strength and adaptability for rugged usage without readily becoming damaged.

Some changes may be made in the construction and arrangement of the parts of my device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope without sacrificing any of the advantages thereof.

I claim as my invention:

1. In a rotary hoe of the type comprising one or more wheels each composed of a pair of cooperating plates and a plurality of circumferentially spaced apart, outwardly projecting, double pronged teeth each having a U-shaped anchorage portion clamped firmly between said plates, together with bolts for securely connecting said plates together; the improvement which comprises a pair of plates having a plurality of sets of circumferentially spaced apart, complementary U-shaped grooves to constitute seats for the anchorage portion of said teeth, said plates having a plurality of sets of aligned, outwardly extending projections, disposed intermediate the legs of each of said grooves, and the outer marginal edge of each plate, intermediate adjacent projections, terminating in laterally extending flanges.

2. In a rotary hoe of the type comprising one or more wheels each composed of a pair of cooperating plates and a plurality of circumferentially spaced apart, outwardly projecting, double pronged teeth each having a U-shaped anchorage portion clamped firmly between said plates, together with bolts for securely connecting said plates together; the improvement which comprises a pair of plates having a plurality of sets of circumferentially spaced apart, complementary U-shaped grooves to constitute seats for the anchorage portion of said teeth, said plates having a plurality of sets of aligned, outwardly extending projections, disposed intermediate the legs of each of said grooves, and the outer marginal edge of each plate, intermediate adjacent projections, terminating in laterally extending flanges, the end portions of which extend throughout a substantial portion of the length of the sides of said projections.

GEORGE E. KARL.