Nov. 26, 1968 J. A. RAABE ET AL 3,412,491

LOCK FOR REVERSIBLE BUCKET WHEEL

Filed Feb. 17, 1966

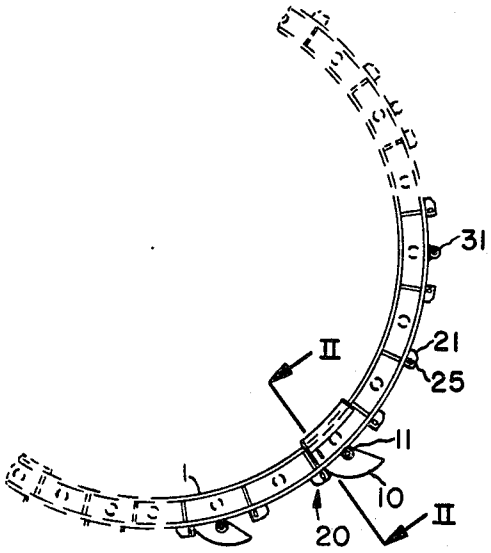


Fig. 1

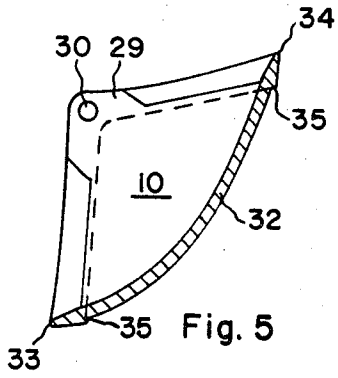


Fig. 5

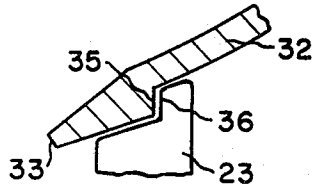


Fig.6

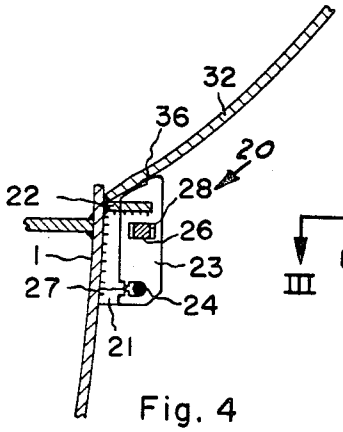


Fig. 4

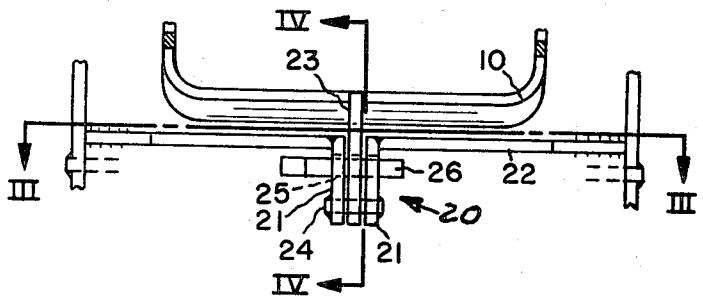


Fig. 2

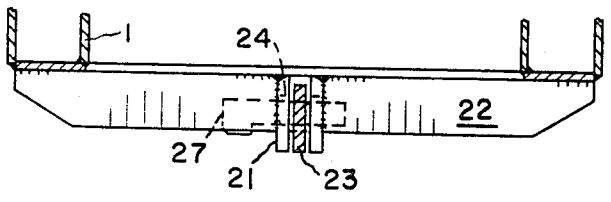


Fig. 3

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United States Patent Office 3,412,491
Patented Nov. 26, 1968

3,412,491

LOCK FOR REVERSIBLE BUCKET WHEEL

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Filed Feb. 17, 1966, Ser. No. 528,115
6 Claims. (Cl. 37—189)

ABSTRACT OF THE DISCLOSURE

A bucket wheel digger having reversible buckets so that the digger may be operated in both directions of rotation of the wheel. A locking means cooperates with the buckets to lock them in a selective position. The locking means comprises a clamp and a wedge whereby the clamp is wedged against a bucket adjacent the bucket lip and the bucket lip in turn is wedged against the wheel. A barrier plate cooperates with the bucket lip to prevent spillage.

This invention pertains to a digging wheel or bucket wheel unloader with buckets which may be reversed for operation of the digger in either direction of rotation and in particular to a locking mechanism for holding the buckets in either of their two operating positions relative to the wheel.

Reversible bucket wheel diggers, unloaders or reclaimers are known, for example, from U.S. Patent 1,974,190. However, the locking mechanism heretofore used has not been satisfactory under the harsh conditions of use of such an apparatus and because of the time and difficulty encountered in opening and setting the locking mechanism for reversing the buckets. Obviously, the environment to which such locking mechanism is subject requires that it must not fail to function, or in any way be sensitive to contaimination with dirt and dust during operation of the bucket wheel.

The connection of the bucket to the wheel should also prevent leakage and must be capable of accommodating for wear and continue to prevent leakage.

A primary object of this invention therefore is to provide a locking mechanism for a bucket wheel digger or unloader which is reliable and durable, economically manufactured and quickly and easily opened and closed.

The foregoing objects and advantages of the invention, and additional objects and advantages will be apparent from the following description of a presently preferred embodiment illustrated in the accompanying drawing in which:

FIGURE 1 is a partial side elevational view of a bucket wheel digger or unloader according to the invention. The frame for rotatably supporting the wheel, the drive mechanism etc. are known and form no part of the invention and thus are not illustrated for simplicity.

FIGURE 2 is an enlarged view of the lock according to the invention taken on line II, II of FIGURE 1.

FIGURE 3 is a view taken along line III, III of FIGURE 2.

FIGURE 4 is a view taken on line IV, IV of FIGURE 2.

FIGURE 5 is a side elevation view in section illustrating a bucket member according to the invention.

FIGURE 6 is an enlarged view of a detail of FIGURE 4 showing engagement of the clamp with the bucket.

FIGURE 1 shows only about one-half of a digger wheel **1** for a reclaimer or unloader having a plurality of buckets **10** located in place on the wheel. The buckets **10** (one of which is illustrated on an enlarged scale in FIGURE 5) are positioned as shown in FIGURE 1 for operation of the wheel in a counterclockwise direction. If each bucket **10** is turned approximately 90° in the

counterclockwise direction about a suitable pivot pin **11** the wheel would be rigged for operation in a clockwise direction. The lock means **20** for holding the bucket **10** in both positions includes pairs of brackets **21** welded to the circumference of the wheel **1** and extending radially outwardly.

Referring to FIGURES 2 and 3, it will be apparent that the pair of spaced brackets **21** are connected to barrier plates **22** extending across the width of the wheel **1**. The plates **22** also contribute to the strength of the wheel **1**. The brackets **21**, as noted above, extend radially outwardly from the wheel. The brackets **21** and plates **22** are preferably welded to the wheel **1**, but any suitable fastening may be used. Locking clamp **23** which engages the bucket **10** is hinged by pin **24** to the bracket plates **21** so as to be freely movable between these plates. Each bracket plate **21** is provided with bores for receiving the pin **24**. The pin **24** may be tack-welded at each end to the bracket plates **21**. Also, each bracket plate **21** is provided with aligned slots **25** for receiving a tapered key **26**.

The clamp **23** has an aperture **27** for receiving the pin **24** and a slot **28** for the key **26**. The pin aperture **27** is open in the sense that it has an extension opening out into the space between the brackets **21**. The slots **25** in the brackets **21** and the slot **28** in the clamp **23** are so proportioned that when the key **26** is hammered in it drives the clamp **23** radially inwardly relative to the wheel **1**, i.e., about the pin **24**.

Each bucket **10** has side plates **29** which are provided with apertures **30** for receiving pin **11**. The latter is supported on wheel **1** in brackets **31**. The plates **29** are joined by back plates **32**. The design is such as to provide open buckets from which material will drop inwardly of the wheel as the buckets reach the top of their path. Thus, an open space exists between the side plates **29**. The back plate **32** is provided with two cutting edges **33** and **34**. As more clearly shown in FIGURES 5 and 6, on the back plate of each bucket **10**, adjacent each cutting edge **33**, **34**, there is formed a lip **35**.

The clamp **23** has a lip **36** which is adapted to bear against the lip **35**. The arrangement is such that a cutting edge **33** or **34** will abut the wheel **1** with the lips **35** and **36** in engagement and with the slots **25** and **28** so related that the tapered pin **26** can be inserted and driven in to force the cutting edge down against the wheel and lock the bucket in position.

Further, the arrangement of elements is such that the cutting edge of a bucket **10** will abut the wheel at the barrier plate **22**. Thus leakage (spillage) through the back of the bucket will be prevented. This is significant in that uneven bucket wear at the cutting edges will not result in excessive spillage. The barrier plates **22** prevent it.

With the edges **33**, **34** of the bucket **10** firmly held against the wheel **1**, the digging loads imposed on the bucket during operation of the wheel are transferred to the wheel at the line of engagement therebetween and not at the pivot bracket **31**. Also, the line of engagement of the lip of a bucket on the wheel is locally strengthened by the brackets **21** and plates **22**. Also, it will be apparent that the clamp **23** is not subject to the digging forces imposed on the bucket and therefore the clamp is not subject to breakage from the digging forces.

It will be apparent also that the arrangement disclosed overcomes any difficulty with respect to loosening the clamp since any dirt lodged in the lock **20** will be effectively overcome by hammering the wedging key **26** to open and release the clamp relative to the bucket. Dirt which tends to lock the clamp against pivoting can be discharged from open aperture **27**. It is also noted that the lock **20** according to the invention is quickly and easily fabricated because it consists of a small number of commercially available or readily manufactured parts

of simple configuration which can be attached to a bucket wheel of conventional construction in a minimum of time.

While a preferred embodiment of the invention has been shown and described above, it will be understood that the latter may be embodied otherwise than as herein specifically illustrated or described and that in the illustrated embodiment certain changes in the details of construction and in the arrangement of parts may be made.

What is claimed is:

1. In combination with a digging wheel having hinged bucket members, means for locking said bucket members in one of their operating positions, said locking means comprising a pair of radially extending apertured plates mounted on said wheel and having a space therebetween, a clamp member, means for pivotally supporting said clamp member in said space and wedge means operatively connected with said plates and clamp member for pivoting said clamp into locking engagement with said bucket member.

2. The combination according to claim 1 with the addition of a barrier plate connected with said wheel adjacent said locking means for preventing spillage between the bucket member and said wheel.

3. Apparatus comprising a digging wheel having a plurality of bucket members distributed about the periphery of said wheel, means pivotally connecting said bucket members to the periphery of said wheel, said bucket members having two operating positions and means for locking each of said bucket members in one of its operating positions; each said locking means comprising a pair of spaced, radially extending plate members mounted on said wheel, each said plate member having aligned apertures therein, a clamp member, means pivotally supporting said clamp member between said plate members, a wedge piece, an aperture in said clamp member for receiving said wedge piece, and a corresponding aperture in each said plate member for receiving said wedge piece for moving said clamp member relative to said plate members whereby a bucket member engaged by said clamp member is wedged against said digging wheel by movement of said wedge piece into said apertures.

4. Apparatus according to claim 3 wherein said clamp member has a lip portion for engaging said bucket member, and said bucket member having a lip for engagement with said lip portion of said clamp member.

5. Apparatus according to claim 3 wherein said means for pivotally supporting said clamp member comprises a pin extending between said plate members, said clamp member having an aperture for receiving said pin, and a slot in said clamp member opening into said aperture at one end and the other end of said slot opening into the space between said plates.

6. Apparatus according to claim 3 with the addition of a barrier plate connected with said wheel adjacent said clamp member for cooperating with said bucket member to prevent spillage between said bucket member and said wheel.

References Cited

UNITED STATES PATENTS

1,974,190 9/1934 Miller.
2,300,843 11/1942 Norwood et al.

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A. E. KOPECKI, *Assistant Examiner.*