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W. LEHMAN

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DRAG BUCKET

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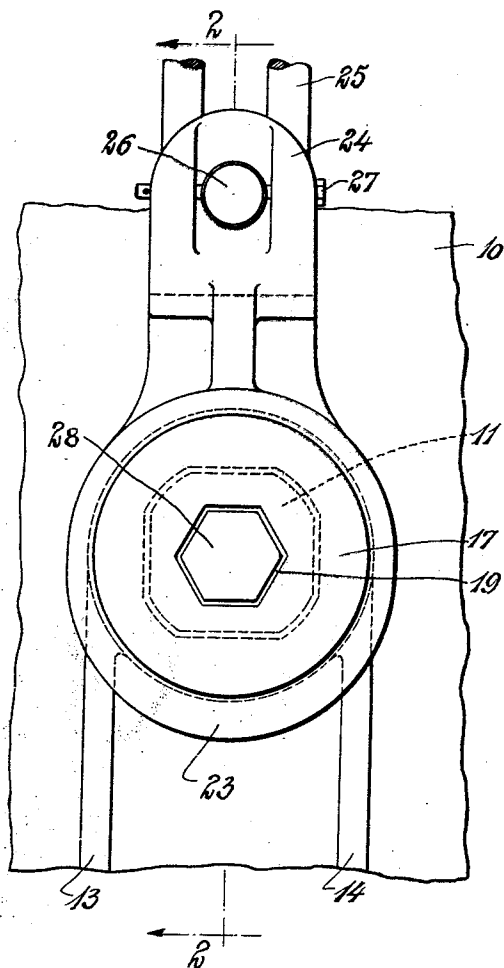


Fig. 1.

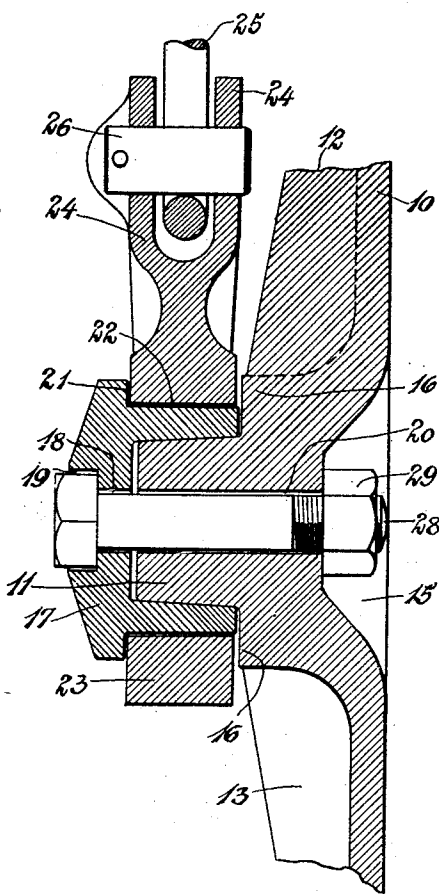


Fig. 2.

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DRAG BUCKET

Application filed May 3, 1930. Serial No. 449,662.

My invention relates to new and useful improvements in drag buckets.

Drag buckets for dragline excavators are well known in the excavating art. They are characterized by having a hoist-rope, which divides above the bucket and is pivoted to two supports which project from the sides of the bucket well behind its center of gravity; a drag-rope, which divides in front of the bucket and is secured to two clevises on the front edges of the sides of the bucket, above and in front of the digging teeth; and a dumping rope which extends from a point on the drag-rope, over a sheave on the hoist-rope, and thence to an anchorage on an arch at the top of the front of the bucket. During hoisting, a slight tension in the drag-rope, is exerted through the dump rope to hold up the front end of the bucket against dumping. A slackening of the drag-rope permits dumping.

In the course of devising a proper means of attaching to such a bucket the gate of U. S. Patent No. 1,490,387 to Hansen, I discovered that the means devised by me for that purpose proved to be also an ideal means for attaching the hoist-chain, even in the absence of the Hansen gate. Such ideal means is hereinafter set forth.

Accordingly it is the principal object of the present invention to provide ideal means for the attachment of the hoist-chain of a drag bucket, which at the same time will provide for the ready convertibility into the Hansen type bucket. It is to be understood, however, that I do not intend to have my invention limited to use in connection with the Hansen invention, as my invention is obviously a marked improvement in itself.

In addition to my principal object, I have worked out a number of novel and useful details, which will be readily evident as the description progresses.

My invention consists in the novel parts, and in the combinations and arrangements thereof, which are defined in the appended claims; and of which one embodiment is exemplified in the accompanying drawings, which are hereinafter particularly described and explained.

Throughout the description, the same reference number is applied to the same member or to similar members.

Figure 1 is a side elevation of my device in position on the side of a drag bucket.

Figure 2 is a vertical section thereof, taken along the line 2—2 of Figure 1, and including a part of the bucket wall.

Referring to the drawings, it will be seen that 10 is the wall of the bucket. Projecting laterally from this wall is a boss 11, supported by flanges 12, 13 and 14, and having a recess 15 thereunder, on the inner surface of the bucket. This recess fulfills the dual purpose of preventing the bolt 28 (hereinafter referred to) from projecting into the cavity of the bucket, and of preventing the occurrence of any undue thickness of metal in casting.

At the base of the boss 11, there is an annular abutment 16.

The boss proper is tapered, and is in cross-section a square, with rounded corners, although many other cross-sections would be satisfactory to my purpose, which is to prevent the cap 17 (hereinafter referred to) from wearing the boss by rotating thereon.

In the claims I shall accordingly employ the term "non-circular" to mean any cross section such as will prevent the cap 17 from rotating on the boss 11.

I provide a cap 17, having an inner surface exactly corresponding to the tapered outer surface of the boss 11. These surfaces are, however, so related, and the relative depth of cap and boss are such, that the cap will not abut either the head of the boss 11 or the abutment 16, even when firmly seated.

Through the head of the cap 17 there is a hole 18, terminating in a hexagonal recess 19. Aligned with this hole 18, there is a hole in the boss 11.

The cap has an annular abutment 21. The outer surface 22 of the cap is cylindrical.

The terminal link of the hoist-chain takes the form of a yoke 23, which fits loosely over this surface 22, between the abutments 16 and 21, and is not quite thick enough to be clamped between these abutments. It is evident that I might employ, in place of yoke 23, a specialized terminal link.

The upper end 24 of the yoke is forked for the insertion of the next link 25 of the hoist-chain. This link is held by a pin 26, which in turn is held by a pin 27.

5 Through the aligned holes 18 and 20, of the cap 17 and the boss 11 respectively, there passes a bolt 28, the head of which rests in the hexagonal recess 19, and the nut 29 of which rests in the recess 15. The nut and
10 bolt clamp the cap 17 firmly to the boss 11.

The cap 17 should preferably be made of very soft metal.

As a result of my device, no wear at all results to the non-replaceable boss 11, most
15 of the wear comes on the inexpensive and readily replaceable cap 17, and but little wear on the relatively inexpensive yoke 23.

Attachment of chains can be effected with great rapidity and simplicity.

20 Having now described and illustrated one form of my invention, I wish it to be understood that my invention is not to be limited to the specific form or arrangement of parts hereinbefore described, except in so far as
25 such limitations are specified in the appended claims.

I claim:

1. A device for attaching the hoist-chain to a drag bucket, comprising: a tapered non-
30 circular boss, projecting laterally from the side of the bucket, and having a recess thereunder on the inside of the bucket, and a hole therethrough, and an annular abutment at the base thereof; a cap of softer metal than
35 the hereinafter described yoke, having its internal surface tapered to fit the external surface of the boss, and having its external surface cylindrical and headed by an annular
40 abutment, and having a hole through its head in alignment with the hole in the boss and ending externally in a polygonal recess to fit the head of a bolt; a yoke, swivelly held
45 between the two abutments, and having a cylindrical hole to fit over the external cylindrical surface of the cap, and having means for removably and pivotally attaching a chain
50 thereto; a bolt for insertion through the holes in the cap and the boss, the bolt head being fitted to the polygonal recess of the cap; and a nut for securing the bolt, and for positioning in the recess beneath the boss.

2. A device for attaching the hoist-chain to a drag bucket, comprising: a tapered non-
55 circular boss, projecting laterally from the side of the bucket, and having a recess thereunder on the inside of the bucket, and a hole therethrough, and an annular abutment at the base thereof; a cap for the boss, having
60 its internal surface tapered to fit the external surface of the boss, and having its external surface cylindrical and headed by an annular abutment, and having a hole through its
65 head in alignment with the hole in the boss and ending externally in a non-circular recess to fit the head of a bolt; a yoke, held be-

tween the two abutments, and having a cylindrical hole to fit over the external cylindrical surface of the cap, and having means for removably and pivotally attaching a chain thereto; a bolt for insertion through the holes
70 in the cap and the boss, the bolt head being fitted to the non-circular recess of the cap; and a nut for securing the bolt, and for positioning in the recess beneath the boss.

3. A device for attaching the hoist-chain
75 to a drag bucket, comprising: a tapered non-circular boss, projecting laterally from the side of the bucket, and having a recess thereunder on the inside of the bucket, and a hole therethrough, and an annular abutment at
80 the base thereof; a cap for the boss, having its internal surface tapered to fit the external surface of the boss, and having its external surface cylindrical and headed by an annular abutment, and having a hole through its
85 head in alignment with the hole in the boss; a yoke, held between the two abutments, and having a cylindrical hole to fit over the external cylindrical surface of the cap, and having
90 means for attaching a chain thereto; a bolt for insertion through the holes in the cap and the boss; and a nut for securing the bolt, and for positioning in the recess beneath the boss.

4. A device for attaching the hoist-chain
95 to a drag bucket, comprising: a tapered non-circular boss, projecting laterally from the side of the bucket, and having a hole therethrough and an annular abutment at the base thereof; a cap for the boss, having its
100 internal surface tapered to fit the external surface of the boss, and having its external surface cylindrical and headed by an annular abutment, and having a hole through its head in alignment with the hole in the boss;
105 a yoke, held between the two abutments, and having a cylindrical hole to fit over the external cylindrical surface of the cap, and having means for attaching a chain thereto; a bolt for insertion through the holes in the cap
110 and the boss; and a nut for securing the bolt.

5. A device for attaching the hoist-chain to a drag bucket, comprising: a tapered non-
115 circular boss, projecting laterally from the side of the bucket, and having a hole therethrough and an annular abutment at the base thereof; a cap for the boss, having its internal surface tapered to fit the external
120 surface of the boss, and having its external surface cylindrical and headed by an annular abutment, and having a hole through its head in alignment with the hole in the boss and ending externally in a polygonal recess
125 to fit the head of a bolt; a yoke, held between the two abutments, and having a cylindrical hole to fit over the external cylindrical surface of the cap, and having means for attaching a chain thereto; a bolt for
130 insertion through the holes in the cap and the boss, the bolt head being fitted to the

polygonal recess of the cap; and a nut for securing the bolt.

5 6. A device for attaching the hoist-chain to a drag bucket, comprising: a tapered non-circular boss, projecting laterally from the side of the bucket, and having an annular abutment at the base thereof; a cap for the boss, having its internal surface tapered to fit the external surface of the boss, and having its external surface cylindrical and headed by an annular abutment; a yoke, held between the two abutments, and having a cylindrical hole to fit over the external cylindrical surface of the cap, and having means for attaching a chain thereto; and means for securing the cap firmly wedged upon the boss.

10 7. A device for attaching the hoist-chain to a drag bucket, comprising: a non-circular boss, projecting laterally from the side of the bucket; a cap for the boss, having its internal surface shaped to fit the external surface of the boss, and having its external surface cylindrical; a yoke, having a cylindrical hole to fit over the external cylindrical surface of the cap, and having means for attaching a chain thereto; means for securing the cap upon the boss; and means to prevent the yoke from sliding off the cap.

20 8. A device for attaching the hoist-chain to a drag bucket, comprising: a non-circular boss, projecting laterally from the side of the bucket; a cap for the boss, having its internal surface shaped to fit the external surface of the boss; means for securing the cap upon the boss; and means to prevent whatever part of the chain is placed over the cap, from sliding therefrom.

30 In testimony whereof I affix my signature.
WERNER LEHMAN.

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