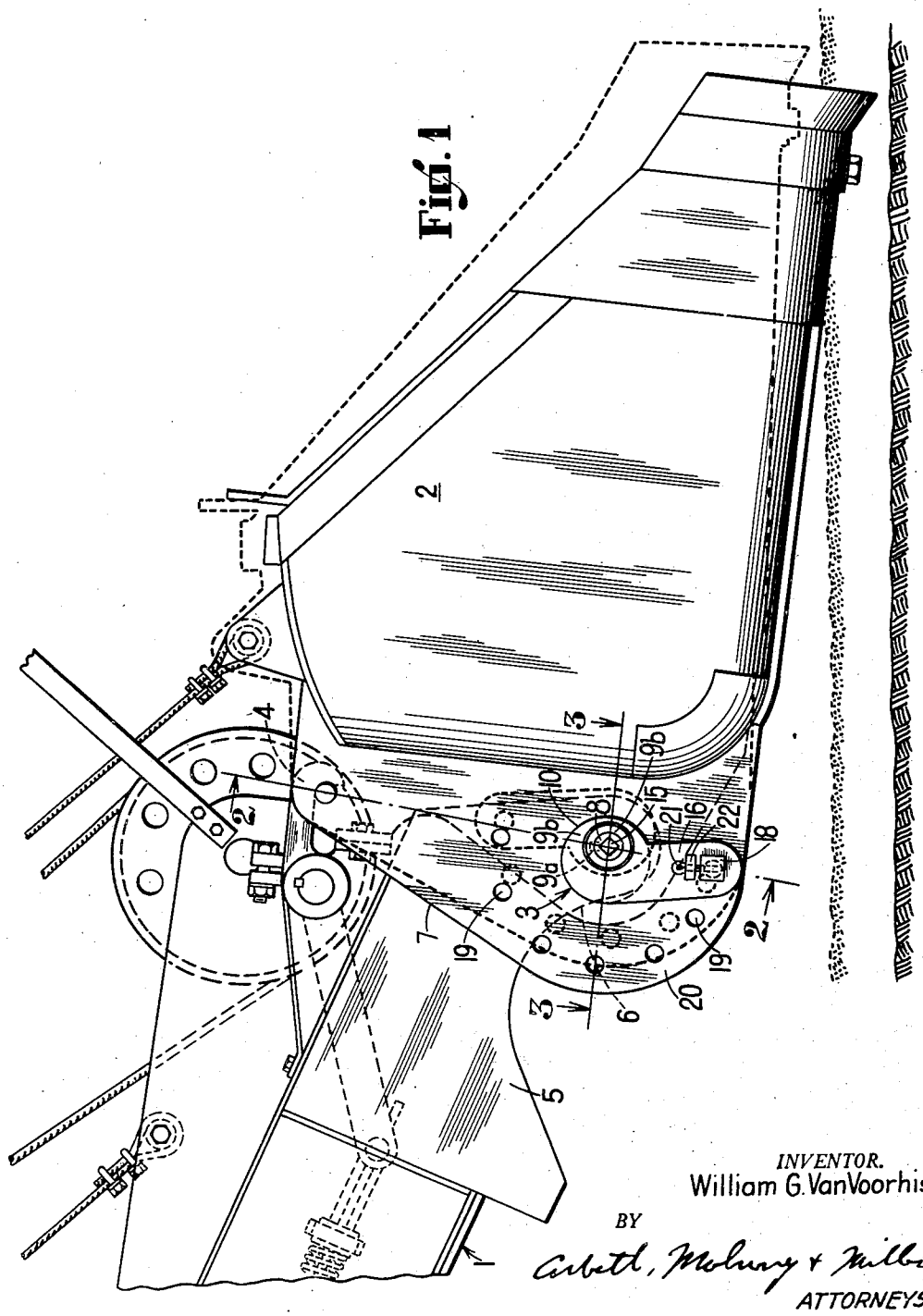
Feb. 22, 1949. W. G. VAN VOORHIS 2,462,790

BUCKET STRUCTURE FOR EXCAVATORS AND LOADERS

Filed June 5, 1946 2 Sheets-Sheet 1

Fig. 1



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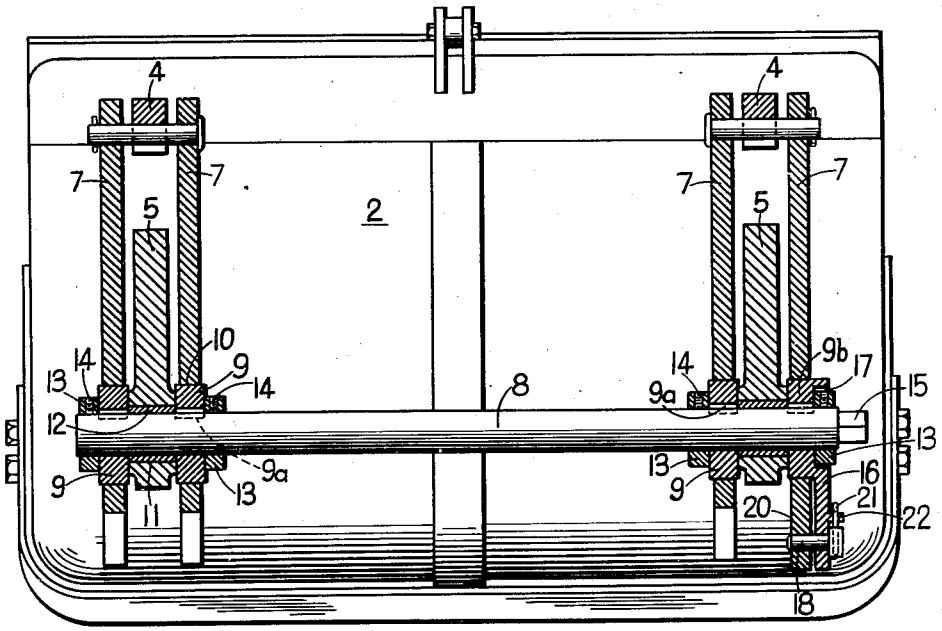


Fig. 2

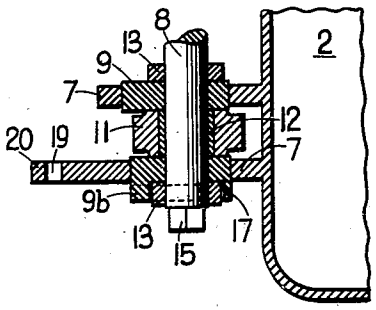


Fig. 3

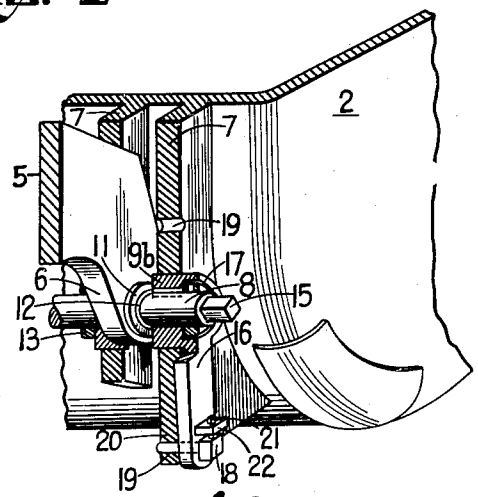


Fig. 4

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2,462,790

BUCKET STRUCTURE FOR EXCAVATORS AND LOADERS

William G. Van Voorhis, Columbus, Ohio, assignor to The Jaeger Machine Company, Columbus, Ohio, a corporation of Ohio

Application June 5, 1946, Serial No. 674,484

8 Claims. (Cl. 214—140)

1

My invention relates to a bucket structure for an excavator and loader.

This invention relates, more particularly, to that type of bucket structure which embodies a bucket pivoted to the outer end of a boom for movement about a horizontal axis between normal working position and dumping position. A releasable latch is associated with the bucket for maintaining it in its normal working position. I have found it desirable to provide means in association with the bucket whereby it may be adjusted so that in its working position its angular relationship relative to the boom can be varied. This adjustment is very useful because it is desirable to have the bucket tilted forwardly when excavating, so that the forward edge of the bucket will dig into the surface more readily, and to have the bucket substantially horizontal when merely scooping up loose material, so that it will not readily dig into the surface upon which the loose material is disposed.

The object of this invention is to provide a simple, effective and rugged structure for pivotally supporting the bucket for swinging movement about a horizontal axis on the end of a boom, which can be easily and quickly adjusted to change the working angle of the bucket relative to the boom.

The preferred embodiment of my invention is illustrated in the accompanying drawings wherein:

Figure 1 is a side elevational view of a bucket structure and associated boom embodying my invention.

Figure 2 is a transverse vertical sectional view taken substantially along line 2—2 of Figure 1.

Figure 3 is a horizontal sectional view taken substantially along line 3—3 of Figure 1.

Figure 4 is a detail, in perspective, of a portion of the bucket and associated adjustable pivot structure.

Before explaining in detail the present invention, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. It is to be understood also that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

In Figure 1 I have illustrated a boom 1 which is of usual structure. Attached to the end of this boom is a bucket 2 which, in its basic structure, is of usual design. The bucket 2 is hinged-

2

ly attached to the boom 1 by my novel adjustable pivot structure 3 for movement about a horizontal axis. Latches 4 of usual structure are provided for maintaining the bucket in working position and are releasable to permit the bucket to swing downwardly into discharge position.

The end of the boom 1 is provided with a pair of forwardly projecting plates 5 which are spaced laterally from each other. These plates are provided with downwardly extending ears 6 which are disposed between a pair of vertically disposed laterally spaced ribs 7 (Figures 2 to 4) which are formed on the rear walls of the bucket 2. For pivotally connecting the plates 5 to the ribs 7, I provide my novel pivot structure 3.

The pivot structure 3 consists of a transversely extending pivot or hinge shaft 8. Each end of the shaft is provided with a pair of eccentrics keyed thereon by means of keys 9a and rotatably disposed in circular openings 10 formed in the ribs 7. All of the eccentrics are designated by the numeral 9 with the exception of the outer one at the extreme right of Figure 2 which is slightly different from the others and is numbered 9b. The eccentrics are rotatable with the shaft, but their axes are eccentric to the shaft axis. Surrounding the shaft, between each pair of eccentrics is a bearing 11 which is an integral part of ear 6 of plate 5. Bearings 11 carry bushings 12. Mounted on the shaft 8 on opposite sides of each pair of eccentrics are the set collars 13 which closely surround the shaft and which are maintained in fixed axial positions by means of set screws 14.

The end of the shaft adjacent eccentric 9b is provided with an angular crank-receiving or wrench-receiving portion 15 by means of which it may be rotated. A radially extending lever arm 16 is formed as an integral part of eccentric 9b. A recess 17 is formed in the outer side of eccentric 9b for the adjacent collar 13. When the shaft is rotated in bearings 11, the lever arm 16 will swing therewith about the axis of the shaft. A locking pin 18 is adapted to be passed through an opening in the outer end of arm 16. This pin may be disposed in any of a series of openings 19 disposed at spaced intervals along an arc in a segment 20 which is formed as a part of the adjacent rib 7. The pin 18 may be held in position by means of a cotter-key 21 which passes through a boss 22, formed on the outer surface of lever arm 16, and through the pin.

Normally the shaft 8 will be locked in a preselected position by the lever arm 16 and the cooperating locking pin 18. When the latches 4

are released, the bucket 2 will swing about the axis of the shaft 8 since the lock pin 18 and the keys 9a hold the ribs 7 of bucket 2, eccentrics 9 and 9b, and shaft 8 in fixed relation. When the bucket is latched in normal working position by the latches 4, as shown in Figure 1, the bottom of the bucket may be tilted downwardly, or may be substantially horizontal depending upon the position of the shaft 8 and the eccentrics carried thereby. To vary this working angle of the bucket, it is merely necessary to remove the locking pin 18 and then rotate the shaft 8. Locking pin 18 is then positioned in another of the openings 19.

During the tilting adjustment of the bucket by varying the rotative positions of the eccentrics 9 and 9b, the latches 4 may move vertically slightly to permit this adjustment.

It will be apparent from the above description that I have provided an adjustable pivot structure for varying the pitch of a bucket pivoted to a boom for swinging movement about a horizontal axis. The structure is such that the working angle of the bucket relative to the boom can be varied easily and quickly to facilitate digging or to facilitate scooping of loose material without digging into the surface upon which it is disposed. The pivot structure is simple and rugged.

Various other advantages will be apparent.

Having thus described my invention, what I claim is:

1. In combination, a boom, a bucket pivoted to the boom for relative movement about a horizontal axis between working position and dumping position, a releasable latch for holding the bucket in working position at a suitable angle relative to the boom, a horizontally disposed pivot pin or shaft for pivotally connecting the bucket to the boom and rotatably carried by the boom, and eccentrics keyed on said pin and rotatably disposed in bearings carried by the bucket whereby the working angle of the bucket relative to the boom can be varied by rotating said pin.

2. Apparatus according to claim 1 including means for locking the eccentrics in various rotative positions.

3. Apparatus according to claim 1 including a lever arm secured to the shaft for rotation therewith, a segment attached to the bucket and over which the lever arm extends, said segment having a series of spaced openings and said lever arm having an opening adapted to be brought into alignment with any of said series of openings, and a locking pin for insertion into said aligning openings.

4. In combination, a boom having a plurality of forwardly projecting vertically disposed and laterally spaced plates, a bucket having at its rear side a plurality of pairs of vertically disposed and laterally spaced ribs, each plate extending between a pair of the ribs, means for pivotally connecting the plates and the ribs together, said means comprising a pivot pin which extends horizontally through aligning openings in the plates and ribs, latch members pivoted to the boom for movement in a vertical plane and normally engaging transverse pins disposed between the ribs and located above the pivot pin, said latch members normally holding the bucket in working position at a suitable angle relative to the boom, eccentrics keyed on said pivot pin and rotatably disposed in bearings which are located in the openings in said ribs, means for rotating said pivot pin to thereby rotate the eccentrics and change the working angle of the bucket relative to the boom, and means for locking the pivot pin in various rotative positions, said means comprising an arm carried by one of the eccentrics and extending over a segment on an adjacent rib having a plurality of spaced locking openings for receiving a locking pin extended through an opening in the arm.

5. In combination, a boom having a plurality of forwardly projecting vertically disposed and laterally spaced plates, a bucket having at its rear side a plurality of pairs of vertically disposed and laterally spaced ribs, each plate extending between a pair of the ribs, means for pivotally connecting the plates and the ribs together, said means comprising a pivot pin which extends horizontally through aligning openings in the plates and ribs, latch members pivoted to the boom for movement in a vertical plane and normally engaging transverse pins disposed between the ribs and located above the pivot pin, said latch members normally holding the bucket in working position at a suitable angle relative to the boom, eccentrics keyed on said pivot pin and rotatably disposed in bearings which are located in the openings in said ribs, means for rotating said pivot pin to thereby rotate the eccentrics and change the working angle of the bucket relative to the boom, and means for locking the pivot pin in various rotative positions.

6. In combination, a support having a plurality of vertically disposed and laterally spaced plates, a bucket having at its rear side a plurality of vertically disposed and laterally spaced ribs associated with said plates, means for pivotally connecting the plates and the ribs together, said means comprising a pivot pin which extends horizontally through aligning opennigs in the plates and ribs, releasable latch structure for normally holding the bucket in working position at a suitable angle relative to the support, eccentrics keyed on said pivot pin and rotatably disposed in bearings which are located in the openings in said ribs, means for rotating said pivot pin to thereby rotate the eccentrics and change the working angle of the bucket relative to the support, and means for locking the pivot pin in various rotative positions.

7. In combination, a support having a plurality of vertically disposed and laterally spaced plates, a bucket having at its rear side a plurality of vertically disposed and laterally spaced ribs associated with said plates, means for pivotally connecting the plates and the ribs together, said means comprising a pivot pin which extends horizontally through aligning openings in the plates and ribs, releasable latch structure for normally holding the bucket in working position at a suitable angle relative to the support, eccentrics keyed on said pivot pin and rotatably disposed in bearings which are located in the openings in said ribs, means for rotating said pivot pin to thereby rotate the eccentrics and change the working angle of the bucket relative to the support.

8. In combination, a support member, a bucket member pivoted to the support member for relative movement about a horizontal axis between working position and dumping position, releasable latch structure for holding the bucket member normally in working position at a suitable angle relative to the support member, a horizontally disposed pivot pin for pivotally connecting the bucket member to the support member and being rotatably carried in bearings in one of said

members, and eccentrics keyed on said pin and rotatably disposed in bearings carried by the other of said members whereby the working angle of the bucket member relative to the support member can be varied, by rotating said pin.

WILLIAM G. VAN VOORHIS.

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Certificate of Correction

Patent No. 2,462,790. February 22, 1949.

WILLIAM G. VAN VOORHIS

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 3, lines 37 and 38, claim 1, strike out the words "or shaft";

and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 28th day of June, A. D. 1949.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.