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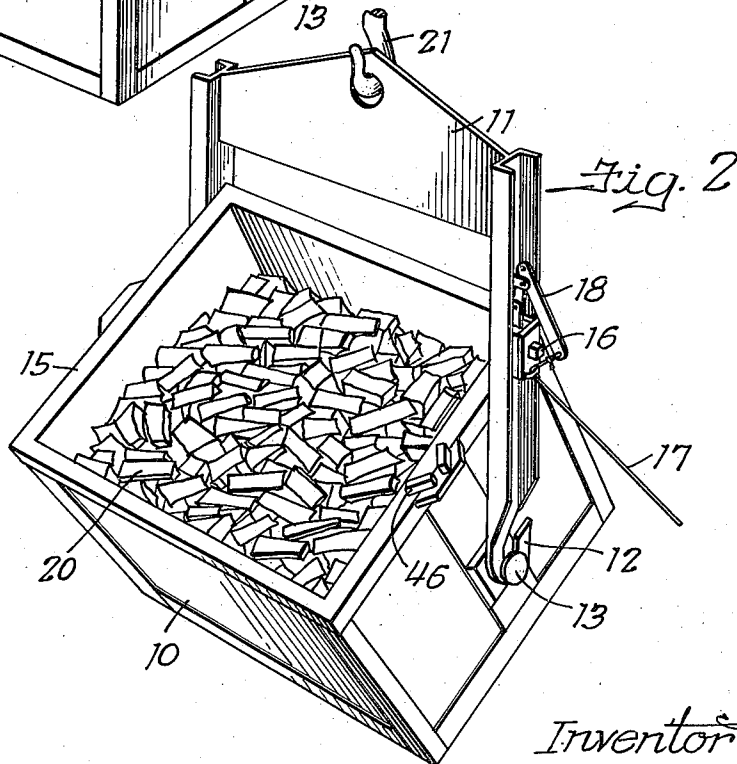
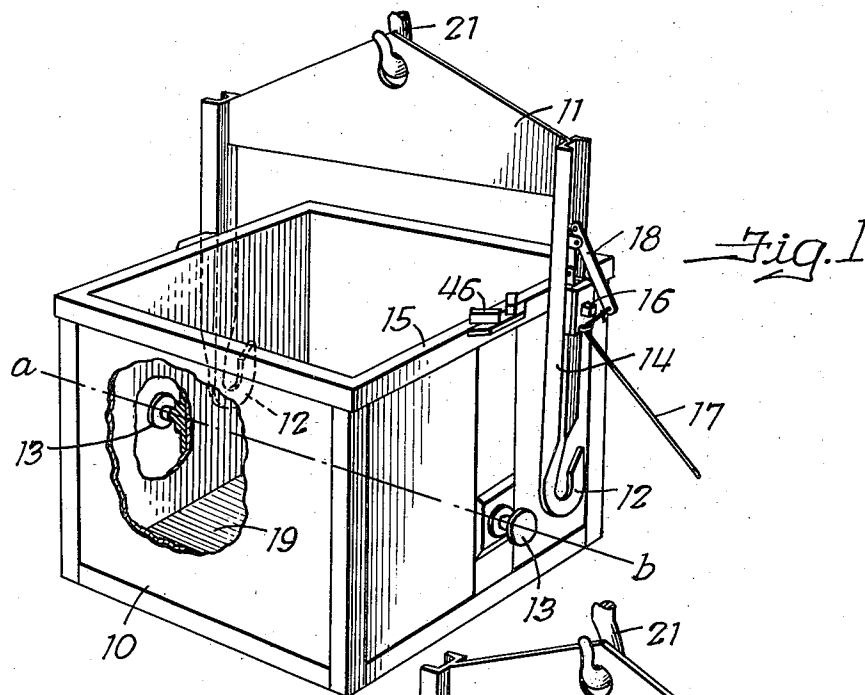
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2,452,243

SELF-TIPPING CONVEYER BUCKET

Filed Oct. 6, 1945

3 Sheets-Sheet 1



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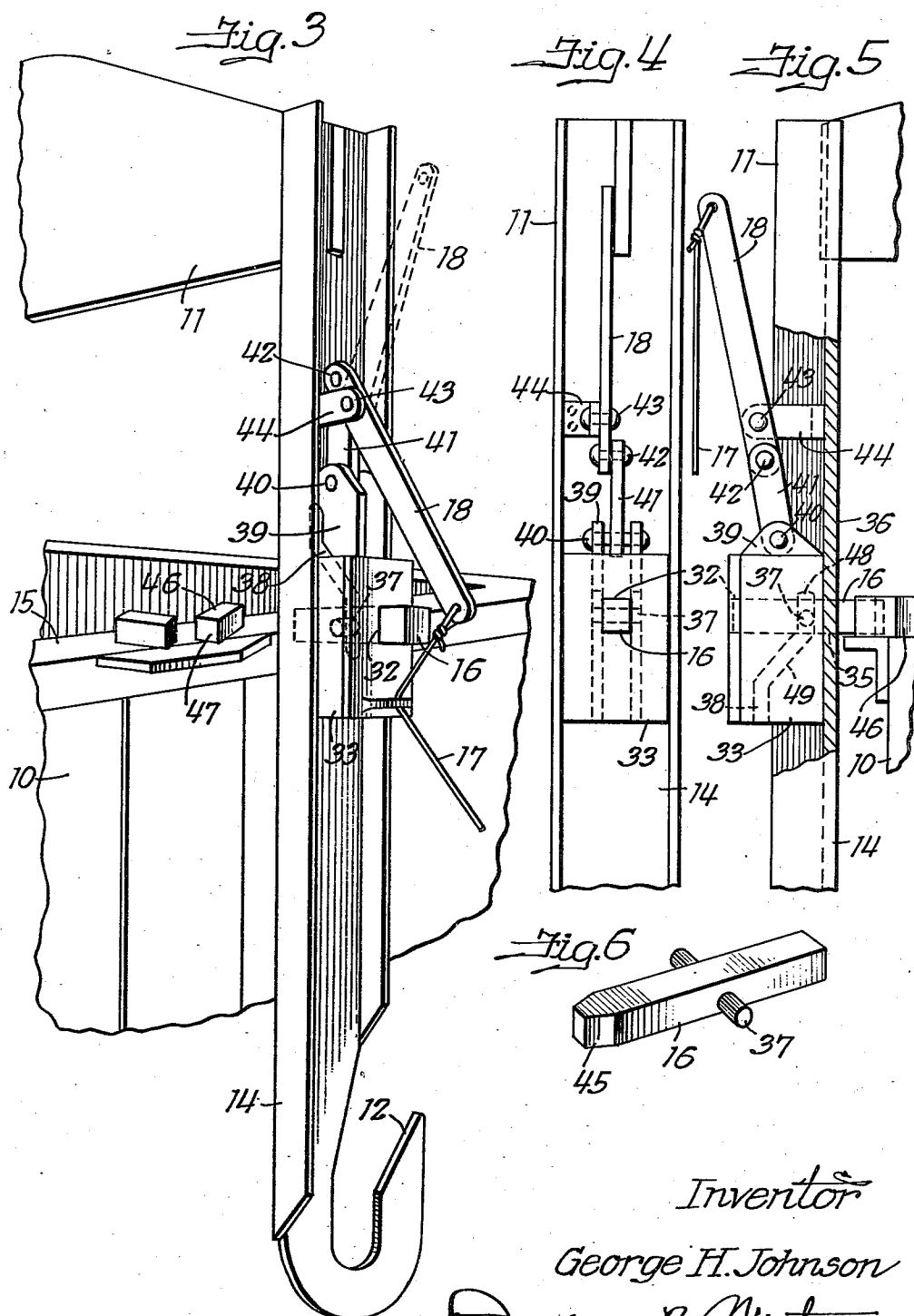
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SELF-TIPPING CONVEYER BUCKET

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3 Sheets-Sheet 2



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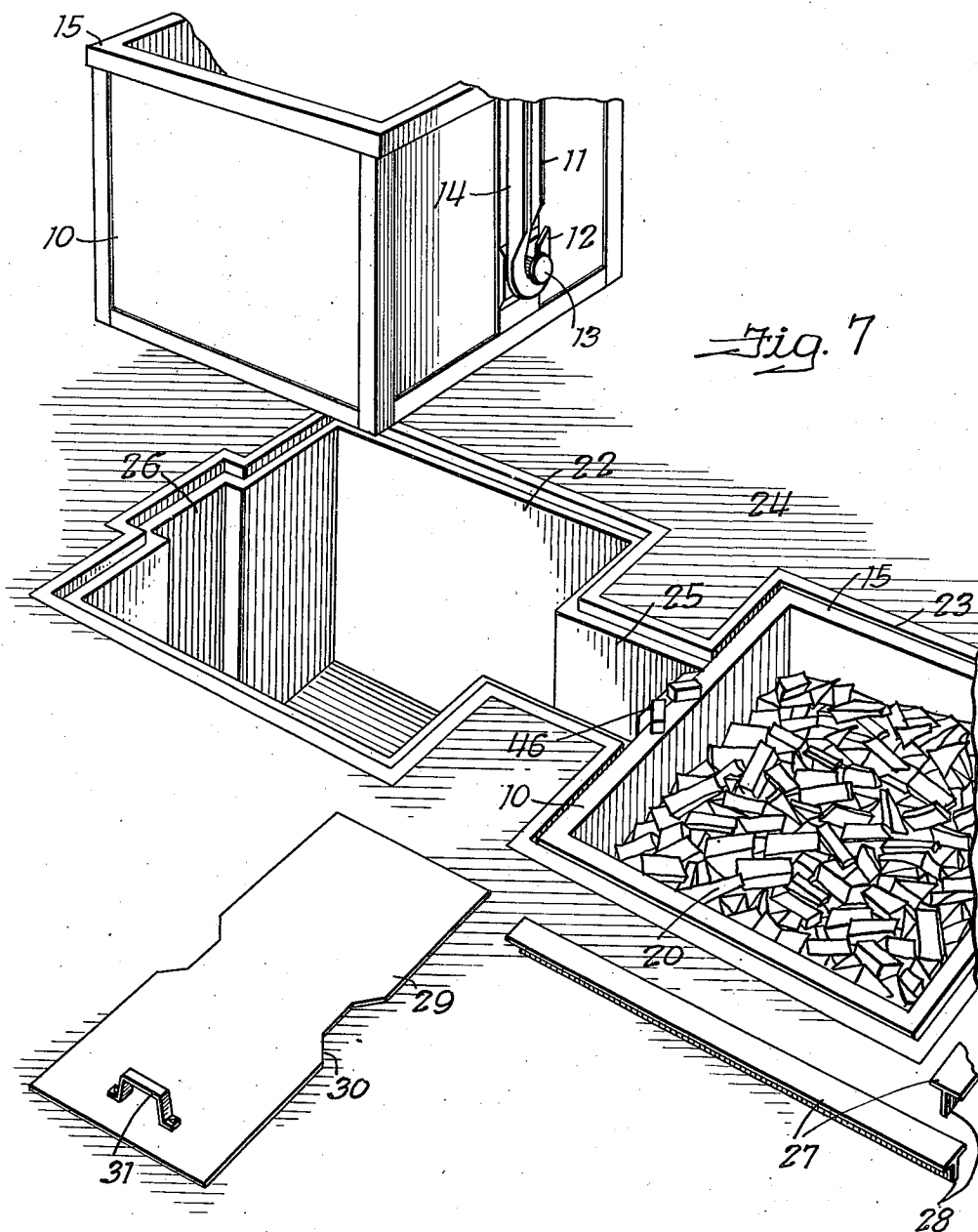
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SELF-TIPPING CONVEYER BUCKET

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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SELF-TIPPING CONVEYER BUCKET

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6 Claims. (Cl. 294—73)

1

This invention relates to a new and improved self-tipping conveyor bucket.

While the present invention has been designed primarily for use in machine shops and other industrial plants for handling scrap material and the like, it will soon appear that it has many other possible applications, wherever similar disposal problems are presented with scrap or any other material capable of being handled in a similar way.

One of the principal objects of my invention is to provide a self-tipping and self-righting bucket, which has aligned trunnions on opposite sides in the vertical plane through the center of gravity of the bucket, slightly above the center of gravity, so that the bucket when dumped will be self-righting but when filled will be unbalanced and, hence, will be self-tipping when released for dumping of the contents.

Another important object is to provide a simple and practical carrier yoke to hook onto the trunnions on the bucket, and lock the bucket to the yoke for quick and easy release from a remote point without, however, giving rise to any danger of the latch bolt being accidentally released.

The invention is illustrated in the accompanying drawings, in which—

Fig. 1 is a perspective view of a self-tipping conveyor bucket, made in accordance with my invention, straddled by a carrier yoke that is also made in accordance with my invention, the yoke being shown disconnected from the trunnions on the bucket;

Fig. 2 is a perspective view of the bucket and yoke in operation at the time of dumping;

Fig. 3 is a larger perspective view of one side of the carrier yoke, to better illustrate the latch and latch operating mechanism;

Figs. 4 and 5 are a front and a side view, respectively, of the latch operating mechanism;

Fig. 6 is a perspective view of the latch bolt removed from the latch mechanism, and

Fig. 7 is a perspective view of a typical industrial plant lay-out for scrap disposal, in accordance with the novel method of my invention.

The same reference numerals are applied to corresponding parts throughout the views.

Referring first to Figs. 1 and 2, the reference numeral 10 designates the conveyor bucket, and 11 the carrier yoke, the two hooks 12 of which are arranged to be detachably connected to the opposed trunnions 13 on the bucket. The arms 14 on which the hooks 12 are provided are arranged to be releasably locked to the top frame 15 of the bucket by means of a latch bolt 16 to prevent tipping of the bucket while the same is being conveyed on a traveling crane, for example, the latch bolt being releasable, as will soon appear,

2

by a pull on the rope 17 attached to the latch bolt operating arm 18 and extending down to the floor to permit dumping the bucket by remote control. The trunnions 13 are located in the middle vertical plane of the bucket on the horizontal center line *a-b* parallel to the bottom 19. This trunnion axis is below the center of the bucket but, due to the fact that the bottom 19 is extra heavy and accordingly lowers the center of gravity of the bucket, is nevertheless a short distance above the center of gravity of the bucket. Thus, when the empty bucket is pivotally supported on the yoke 11 it will naturally assume an upright position. However, if the bucket is filled or partially filled with any material as, for example, the scrap metal indicated at 20 in Fig. 2, and lifted by means of the yoke 11 attached to the trunnions 13, it is quite top-heavy and will, therefore, tip over immediately unless the bucket is locked to the arms 14 by means of the latch bolt 16. Hence, assuming the yoke 11 is attached to a crane hook 21 on the end of a hoisting chain extending downwardly from a traveling crane and the bucket has been conveyed to a point over a truck or railroad car stationed to receive the scrap metal, the scrap metal can be dumped instantly into the truck or car by a pull on the rope 17 to release the latch bolt 16, the bucket being shown in the act of dumping in Fig. 2. As soon as the load has been dumped, the bucket returns to its normal upright position, being bottom-heavy when empty and only top-heavy when filled, or partially filled. The bucket may, therefore, be locked again to the arms 14 of the yoke by means of the latch bolt 16 and returned in that way to the loading station.

Referring now to Fig. 7, I have shown two loading pits 22 and 23 in the floor 24 of an industrial plant, for example, the two pits being interconnected at the middle of one side by a passage 25 and each of the pits having on the diametrically opposite side from the passage a vertical recess 26 to accommodate one side portion of the yoke 11, while the other side portion is accommodated in the passage 25, as, for example, when a bucket 10 is being lowered into one of the pits for reloading, or when the yoke is being lowered into the pit for connection to a bucket preliminary to the hoisting of the bucket out of the pit for emptying into a truck or railroad car. The pits 22 and 23 are both of a size and depth to accommodate the buckets freely with the top frames 15 approximately flush with the floor 24 for convenience in the dumping of scrap metal or whatever other material is to be handled by these buckets. The workmen convey the material to the buckets in the pits in wheelbarrows and dump the material directly into the buckets. T-irons 27 are prefer-

3

ably laid around the top frames 15 with their vertical flanges 28 fitting down in the spaces between the sides of the bucket and the sides of the pit, so that no dirt or material being dumped into the buckets will fall into the pits alongside the buckets and require removal from time to time. A workman can, however, get into and out of the pits easily, should that ever be necessary, to clean out any dirt or material that may have been dropped in accidentally, and at such times the passage 25 is found to be a real convenience for the workman to walk from one pit into the other. A sheet metal cover plate 29 is usually laid over the passage 25 for safety, and it has notches 30 on opposite sides through which the arms 14 of the yoke 11 may be passed for connection with the trunnions 13. A handle 31 is provided on one end of the plate 29 to facilitate handling and preferably projects only to a small extent from the top of the plate so as not to constitute a hazard to workmen walking around the pits. If desired, the handle 31 may be of a hinged type and lie substantially flush with the top of the plate when not in use.

It is, of course, highly important from the safety standpoint that the bucket 10 be securely locked in rigid relation to the yoke 11 when it is being hoisted and conveyed to the dumping station. The latch bolt 16 is operated in such a way that there is no danger of its being accidentally released. The latch bolt is slidably guided at its outer end in an opening 32 provided in the outer wall of a housing 33 suitably secured between the flanges 34 of the yoke arm 14, and has its inner end portion suitably guided in an opening 35 provided in the web portion 36 of the channel-shaped arm 14. A cross-pin 37 on the latch bolt operates in slots 38 provided in plates 39 that are slidably guided in the housing 33 on opposite sides of the latch bolt. The plates 39 are pivotally connected at 40 to a link 41 which in turn is pivotally connected at 42 to the end of the latch bolt arm 18, previously mentioned. This arm 18 is pivoted near the end thereof at 43 to a bracket 44 suitably secured to the web portion 36 of the arm 14. The latch bolt 16 has its inner end beveled, as indicated at 45, for easier entry into and removal from the keeper 46 provided on the top frame 15 of the bucket, the approximately 45° angle of the bevels 45 and the matching 45° angles on the mating faces 47 of the keeper 46 assuring easy entry of the latch bolt in the keeper regardless of such slight misalignment as is apt to occur. This angularity also serves to insure easier unlocking of the bucket, because as a result of this angularity the latch bolt 16 is under end thrust in an outward direction and will release the bucket immediately upon operation of the arm 18 by a pull on the rope 17. However, so long as the arm 18 is raised, as shown in Fig. 5, so that the toggle link 41 has its pivot 42 in line with the pivots 40 and 43, there is not even the slightest danger of the latch bolt 16 being retracted accidentally. Furthermore, as clearly appears in Fig. 5, the upper end portion 48 of the slots 38 are at right angles to the longitudinal center line of the latch bolt 16, thereby further positively resisting the tendency for the bolt to move outwardly. It is only when the arm 18 has been pulled downwardly enough to cause the pin 37 to ride into the inclined middle portion 49 of the slots 38 that the outward thrust on the bolt 16 can take effect to assist in the unlocking of the bucket for tipping.

It is believed the foregoing description conveys

4

a good understanding of the objects and advantages of my invention. The appended claims have been drawn with a view to covering all legitimate modifications and adaptations.

I claim:

1. In a dump bucket structure comprising a carrier yoke and a bucket pivotally mounted in said yoke, means for releasably locking said bucket in rigid relation to said yoke comprising a latch bolt slidably mounted on the yoke in radially spaced relation to the pivots, a keeper on the bucket for engagement by said bolt, said bolt having a pin projection on the side thereof, a slide guided on the yoke and movable in transverse relation to said bolt and having a slot receiving said pin projection to reciprocate said bolt by reciprocatory movement of said slide, a manually oscillatable lever pivoted on said yoke intermediate its ends, and a toggle link pivotally connected to said slide at one end and at the other to the inner end of said lever, said lever being movable to a locking position in which its pivotal connection to said link is aligned with the lever pivot and the link's pivotal connection to said slide.

2. A dump bucket structure as set forth in claim 1, wherein said latch bolt has its keeper engaging end tapered at approximately 45° and arranged to engage tapered surfaces on the keeper of approximately the same angularity, whereby said bolt is under end thrust in an outward direction when the bucket is loaded.

3. A dump bucket structure as set forth in claim 1, wherein said latch bolt has its keeper engaging end tapered at approximately 45° and arranged to engage tapered surfaces on the keeper of approximately the same angularity, whereby said bolt is under end thrust in an outward direction when the bucket is loaded, and wherein the slot in said slide has an end portion substantially at right angles to the bolt to receive the pin projection when the slide is in locking position.

4. A positively locking latch mechanism comprising a latch bolt slidably mounted on one of two members to be interlocked, a keeper on the other of said members for engagement by said bolt, said bolt having a pin projection on the side thereof, a slide guided on the first member and movable in transverse relation to said bolt and having a slot receiving said pin projection to reciprocate said bolt by reciprocatory movement of said slide, a manually oscillatable lever pivoted on said first member intermediate its ends, and a toggle link pivotally connected to said slide at one end and at the other end to the inner end of said lever, said lever being movable to a locking position in which its pivotal connection to said link is aligned with the lever pivot and the link's pivotal connection to said slide.

5. A latch mechanism as set forth in claim 4 wherein said latch bolt has its keeper engaging end tapered at approximately 45° and arranged to engage tapered surfaces on the keeper of approximately the same angularity whereby said bolt is under end thrust in an outward direction when the interlocked parts tend to move laterally with respect to one another, and wherein the slot in said slide has an end portion substantially at right angles to the bolt to receive the pin projection when the slide is in locked position.

6. A latch mechanism as set forth in claim 4, wherein said latch bolt has its keeper engaging end tapered at approximately 45° and arranged to engage tapered surfaces on the keeper of approximately the same angularity whereby said bolt is

under end thrust in an outward direction when the interlocked parts tend to move laterally with respect to one another.

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