

March 18, 1930.

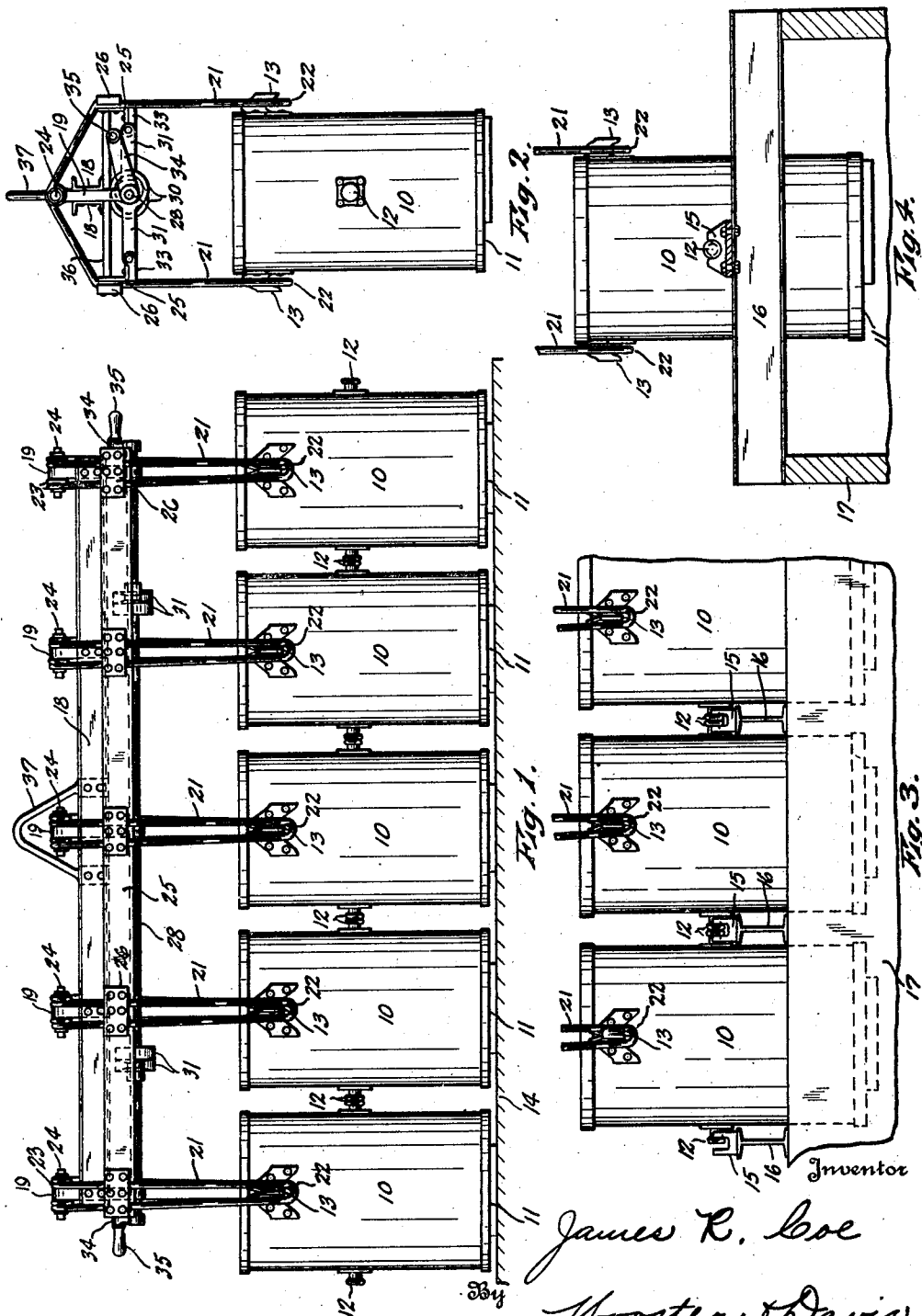
J. R. COE

1,750,878

BARREL HANDLING APPARATUS

Filed Feb. 18, 1927

2 Sheets-Sheet 1



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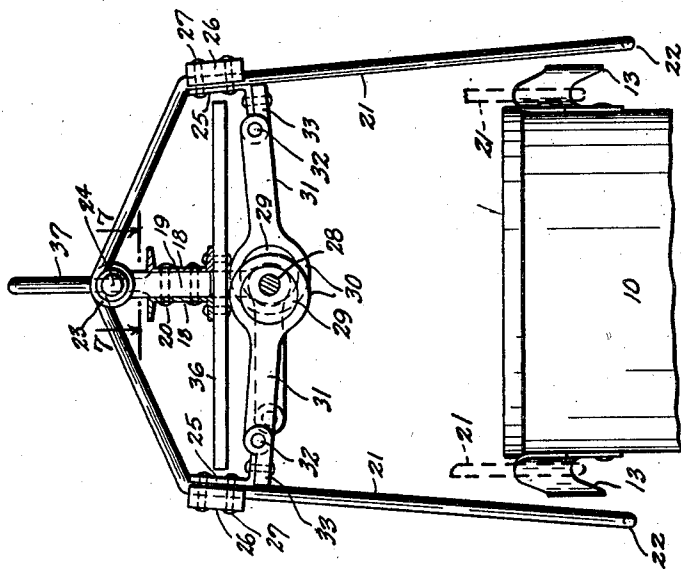


Fig. 6.

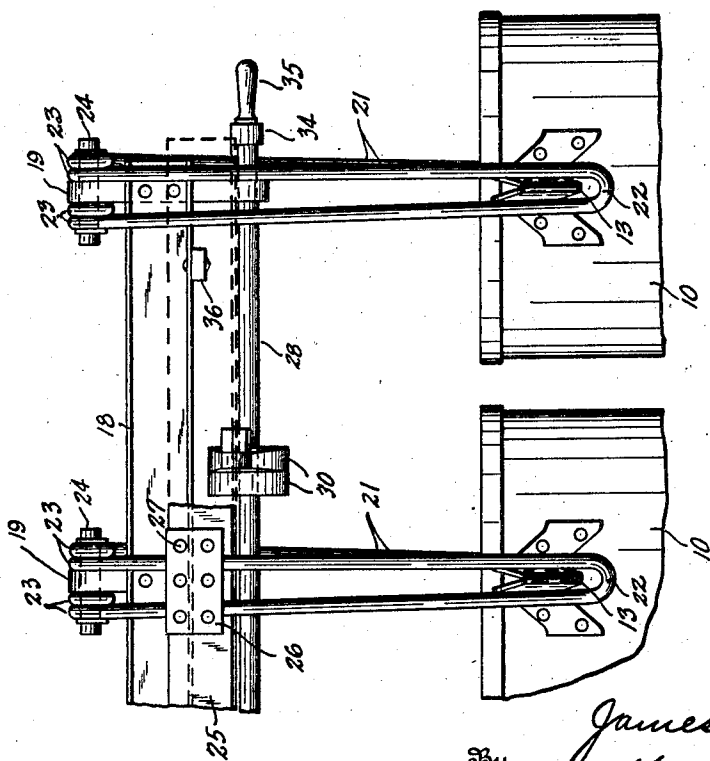


Fig. 5.



Fig. 7.

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UNITED STATES PATENT OFFICE

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BARREL-HANDLING APPARATUS

Application filed February 18, 1927. Serial No. 169,209.

This invention relates to lifting tongs for simultaneously carrying a plurality of barrels. In manufacturing establishments, especially mills for making metal articles, there is a large amount of scrap and metal which is ordinarily carried in barrels and each barrel may involve considerable weight when filled. To facilitate the moving of these barrels from one department to another or from one location to another it is desirable to carry a number of them at a time, thus reducing the cost of transportation and also increasing capacity.

It is, therefore, an object of the present invention to provide an effective, efficient and reliable tongs for carrying a plurality of these barrels.

It is also an object of the invention to provide tongs of this character which may be applied to a number of barrels and then lifted by an ordinary crane or a traveling crane, and it is another object of the invention to provide tongs which may be operated to engage the lifting means of a plurality of barrels simultaneously at a single operation, or in a similar manner be disconnected simultaneously from the plurality of barrels after they have been carried to their destination.

With the foregoing and other objects in view, I have devised a set of tongs, the preferred embodiment of which is illustrated in the accompanying drawings forming a part of this specification. In these drawings—

Fig. 1 is a side elevation of the tongs showing them applied to a plurality of barrels ready to lift the same.

Fig. 2 is an end elevation looking from the right of Fig. 1.

Fig. 3 is a side elevation of a plurality of barrels showing how the device may be used for barrels arranged on trunnion supports.

Fig. 4 is an end elevation looking from the right of Fig. 3.

Fig. 5 is a side elevation of one end of the tongs showing two sets of lifting elements, and one of the tie beams being broken away, the scale being somewhat larger than that of Figs. 1 to 4.

Fig. 6 is an end elevation looking from the right of Fig. 5, and

Fig. 7 is a detail section substantially on line 7—7 of Fig. 6.

The tongs illustrated are shown as adapted to carry five barrels at one time but, of course, it is not limited to this number, although this number has been found to be practical in operation. The barrels indicated at 10 are preferably of the type described in my co-pending application Serial No. 169,208, filed of even date herewith. This barrel usually comprises a sheet metal body closed at its lower end by a reenforced head 11, and has on its opposite side walls suitable trunnions 12 by which they may be mounted in trunnion supports, as shown in Figs. 3 and 4, or carried by the standard trunnion truck. Adjacent their upper ends they are provided on their opposite sides with carrying hooks 13, and these hooks, as indicated on the drawings, are arranged in a vertical plane at right angles to the plane of the trunnions 12. The hooks and trunnions, therefore, cooperate as a means for positioning the barrels in an arrangement whereby they may be all simultaneously engaged by the lifting means of the tongs. As shown in Fig. 1, a plurality of barrels 10, in the present instance five, are placed in alignment on any suitable support as the floor 14 with the trunnions 12 on adjacent barrels arranged end to end. This arrangement will automatically place the carrying hooks 13 on opposite sides of the line of barrels and in proper spaced position for engagement by the tongs. The same effect is secured, as indicated in Figs. 3 and 4, if the barrels are mounted in suitable trunnion supports 15 on suitable transverse beams 16 over a storage bin 17, for instance. The barrels may be simultaneously carried from the position indicated in Fig. 1 to this bin and simultaneously placed in the trunnion supports as indicated, and then after being dumped may be simultaneously lifted from the trunnions by the tongs and carried back to their original position for refilling.

These tongs are of an improved construction which is strong and easily operated, and by a simple movement of a lever may simultaneously engage or disengage the carrying hooks of the plurality of barrels arranged in

alignment. These tongs comprise a longitudinally extending support shown in the present construction as composed of two spaced channel beams 18, and between these beams at suitable locations corresponding to the distance between the center lines of the barrels are upright blocks 19, and the blocks and beams are connected together by any suitable means as bolts or rivets 20.

Pivotaly connected to each block or upright member is a pair of lifting elements 21. These elements may be of various forms or constructions, but it is preferred to make them substantially as shown as this is very strong, easily mounted and very simple in construction. I have shown them as comprising a rod bent upon itself at its mid length, as shown at 22, to form a loop or in effect a hook to engage the hooks 13 on the barrels. Then the free ends extend upwardly and inwardly and form a loop or eye 23 by which these elements may be pivoted to the members 19 above the support 18 by a pin 24. So mounted the lower free ends or the loop or hook 22 may be swung laterally toward or from each other about this pivot. An open hook at the lower free ends of these elements would give the same effect, but the construction shown is preferred as it is stronger because both sides are supported and also there is no free end or point to catch on other objects in operation.

Extending longitudinally of the tongs on opposite sides of the support 18 is a pair of tie beams 25, preferably in the form of an angle beam as shown, and each tie beam is rigidly connected to each of the lifting elements 21 on its side of the main support. A convenient and effective means for attaching them is by means of a block 26 on the outside of the elements and clamped to the tie beams 25 to clamp the elements to this beam by means of suitable bolts or rivets 27. By this arrangement the lifting elements on each side of the tongs are rigidly connected together so that they swing in unison about their pivots.

A simple and effective means is also provided for simultaneously swinging the lower ends of these elements toward and from each other, and therefore, toward and from the lifting hooks 13 on the line of barrels. In the present drawings is shown a shaft 28 extending longitudinally of the support 18 and having bearings in any desired number of blocks 19. Carried by this shaft are eccentrics 29, in the present construction there being shown two sets of these eccentrics adjacent the opposite ends of the tongs, and there being two eccentrics in each set. Each eccentric is embraced by a strap 30 of a link 31 pivoted at its opposite end, as shown at 32, to a suitable block 33 carried on the tie beams 25. The eccentrics of each pair are arranged opposite so that as the shaft is turned these eccentrics

operating through the links 31 will simultaneously draw the lifting elements 21 toward each other or simultaneously move them outwardly to separate them, and it is preferred that they be so arranged that the center of the eccentrics will go slightly over the line joining the centers of the shaft 28 and the pivot 32 when the lower end of the lifting elements are separated to give a slight toggle effect to hold the tongs in this open position. The shaft is operated by means of a crank 34, there being a crank at each end of the shaft so that the tongs can be operated from either end. This crank has the usual handle 35 for operation. It is also preferred to mount on the support 18 one or more transversely extending bars 36 of suitable length to engage the tie beams 25 to limit the inward movements of these beams and the lifting elements. A suitable lifting loop or hook 37 is mounted at the center of the supporting beams 18 into which the lifting hook of a travelling crane or other conveyor may be attached for lifting the tongs and the barrels carried thereby.

In operation, after the plurality of barrels have been placed in a row, as indicated for example in Fig. 1, the tongs may be lowered by the crane with the lifting elements 21 on opposite sides of the barrels and, of course, in separated or open position, as indicated in full lines in Fig. 6. Then by merely swinging the crank 34 over to the opposite side, the lower free ends of these lifting elements can be drawn inwardly through the action of the eccentrics so that the loops or hooks 22 will engage under the carrying hooks 13 on the barrels, and it will be apparent that this single operation of the crank 34 will simultaneously engage these elements under the hooks of all of the barrels. The tongs and with it the entire line of barrels may then be lifted by the crane and carried to any location desired.

It will be apparent that this construction is very simple, strong, easily operated and that the plurality of barrels may be easily and effectively carried from one location to another and be simultaneously engaged and disengaged by the tongs.

Having thus set forth the nature of my invention, what I claim is:

1. In lifting tongs for carrying a plurality of barrels, two sets of spaced lifting elements extending longitudinally of the tongs and each set including a plurality of loops to engage hooks on opposite sides of a plurality of barrels in a row, and a single operating means operable from either end of the device for simultaneously swinging the two sets of elements to and from the barrels.

2. In tongs for lifting a plurality of barrels, a longitudinally extending supporting beam, a plurality of spaced pairs of lifting elements pivotally mounted on the beam,

each pair being mounted so as to depend on opposite sides of the beam to engage hooks on opposite sides of a barrel, means mounted on the beam and connected to said elements for moving said elements toward and from the barrels, and means for operating said element moving means from a single position.

3. In lifting tongs, a central longitudinally extending support, a plurality of pairs of lifting elements spaced longitudinally of the support, the elements of each pair being pivotally mounted on the support to swing toward and from each other and depending on opposite sides of the support to engage lifting hooks on opposite sides of a barrel, and means for simultaneously moving all of said elements toward and from the barrels.

4. In lifting tongs, a longitudinal support, a plurality of pairs of lifting elements spaced longitudinally of the support, the elements of each pair being pivotally mounted on said support and extending outwardly and downwardly from opposite sides of the support, a movable member connecting the elements on each side of the support, and means carried by the support to shift said members toward and from each other to swing the free ends of the lifting elements toward and from each other.

5. In lifting tongs, a longitudinal support, a plurality of pairs of lifting elements spaced longitudinally of the support, the elements of each pair being pivotally mounted on said support and extending outwardly and downwardly from opposite sides of the support, a longitudinally extending beam spaced outwardly from the support on each side thereof and connected to the lifting elements on that side, a shaft carried by the support, means operated by the shaft for shifting said beams laterally to shift said elements and means for operating the shaft.

6. In lifting tongs, a longitudinally extending support, a plurality of pairs of lifting elements pivotally mounted on said support, each pair comprising a heavy wire or rod extending outwardly and downwardly from the support and bent upon itself at its lower end to form a loop, the upper free ends being pivoted to the support, and means carried by the support to swing said elements about their pivots.

7. In lifting tongs, a longitudinal support comprising a pair of spaced channel beams, upright members mounted between said beams and spaced from each other longitudinally thereof, a pair of lifting elements pivoted to each member and extending laterally outwardly and downwardly from their pivots and provided at their lower ends with means to engage lifting hooks on barrels, a shaft carried by said members, means operated by the shafts for swinging the lower ends of the lifting elements toward and from each other, and means for operating the shaft.

8. In lifting tongs, a longitudinally extending supporting beam, a plurality of pairs of lifting elements pivotally mounted on the beam and spaced from each other longitudinally of the beam, each pair comprising laterally and downwardly extending elements having loops at their lower ends, a longitudinally extending tie beam spaced laterally on each side of the support and connected to the lifting elements on that side to tie them together, means for shifting the tie beams laterally toward and from each other to swing the lifting elements about their pivots, and transverse stop elements carried by the support to engage said beams to limit their movements.

In testimony whereof I affix my signature.

JAMES R. COE.

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