Aug. 14, 1951 S. F. JACKES ET AL 2,564,436

APPARATUS FOR TURNING COILS OR THE LIKE

Filed Sept. 25, 1946 3 Sheets-Sheet 1

FIG. 1.

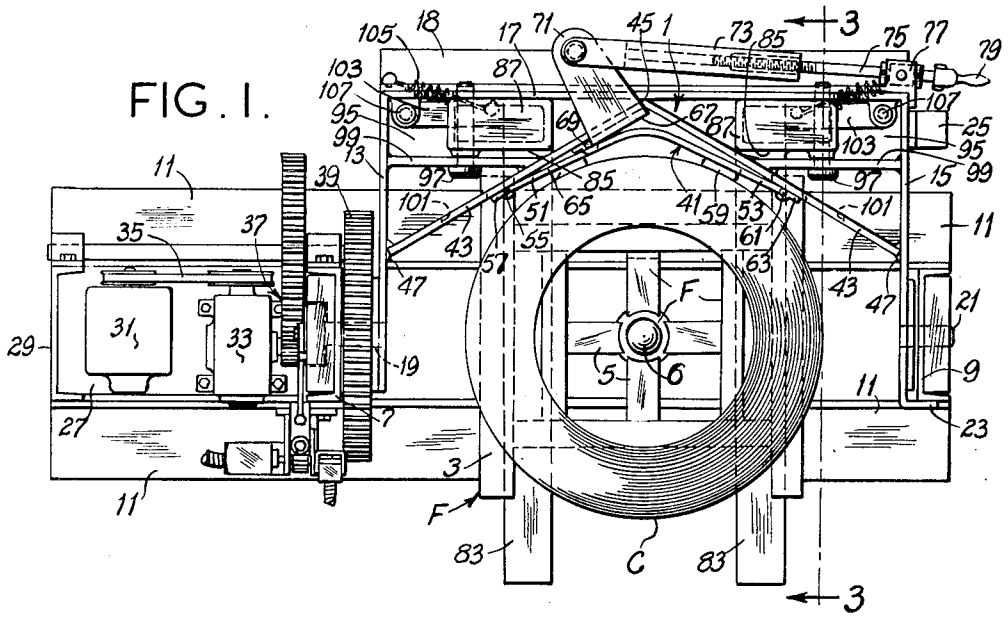
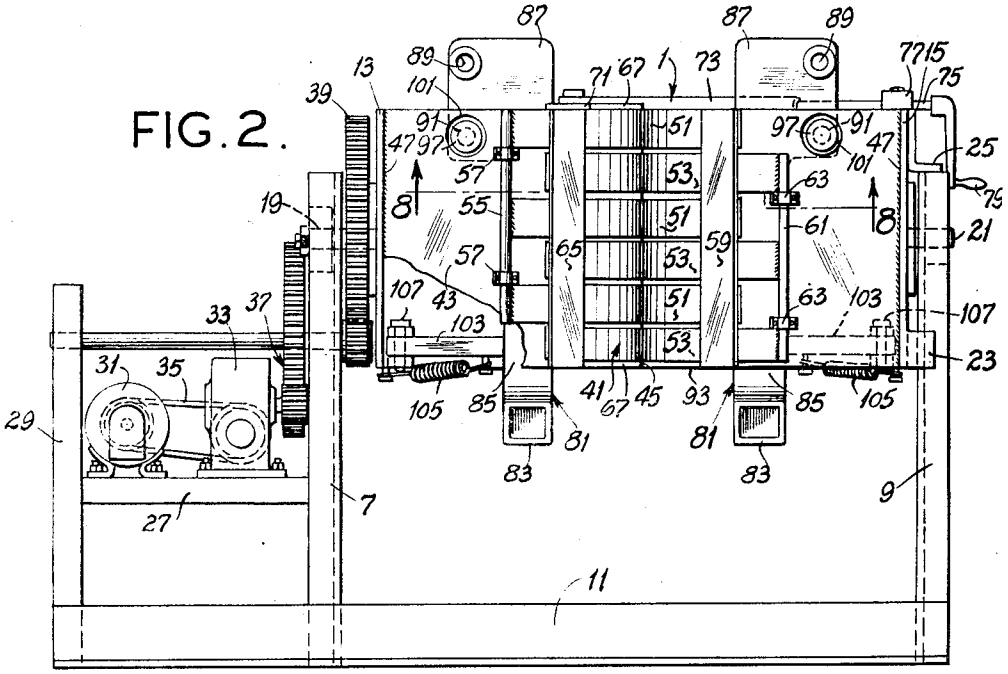


FIG. 2.



Stanley F. Jackes,
Ray H. Sheets,
Inventors.
Haynes and Koenig,
Attorneys.

Aug. 14, 1951 S. F. JACKES ET AL 2,564,436

APPARATUS FOR TURNING COILS OR THE LIKE

Filed Sept. 25, 1946 3 Sheets-Sheet 2

FIG. 5.

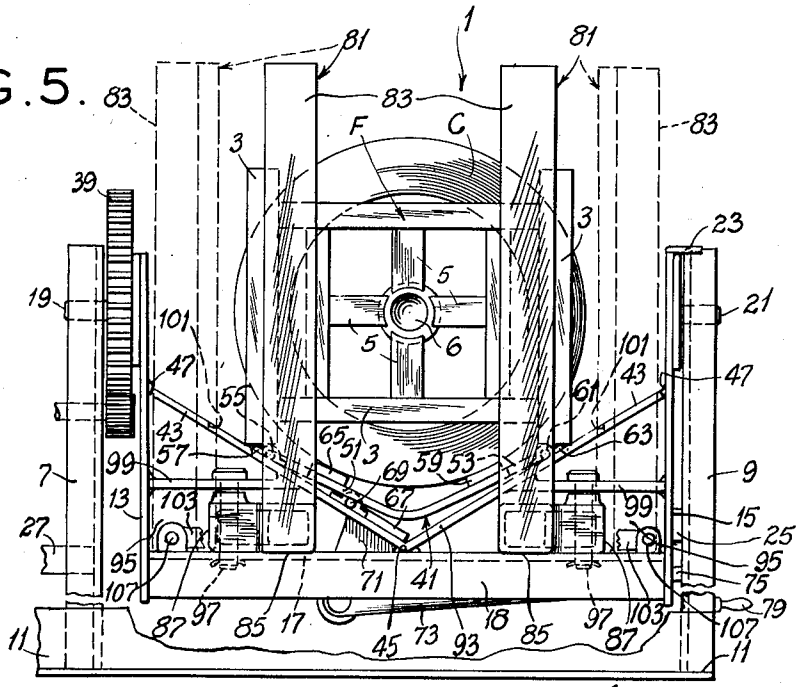


FIG. 6.

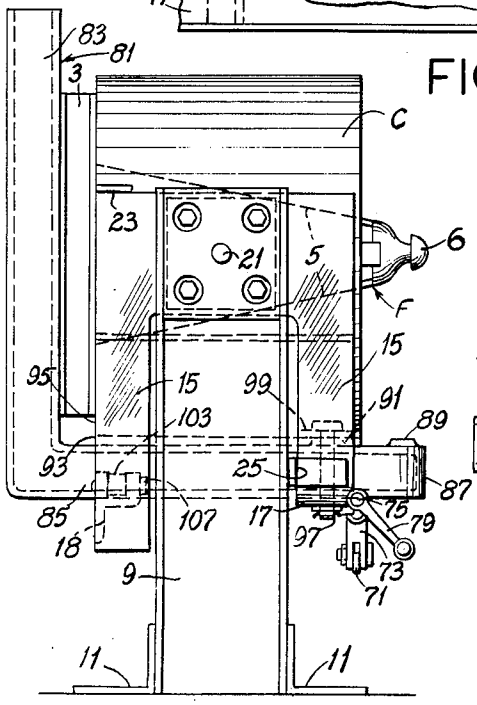
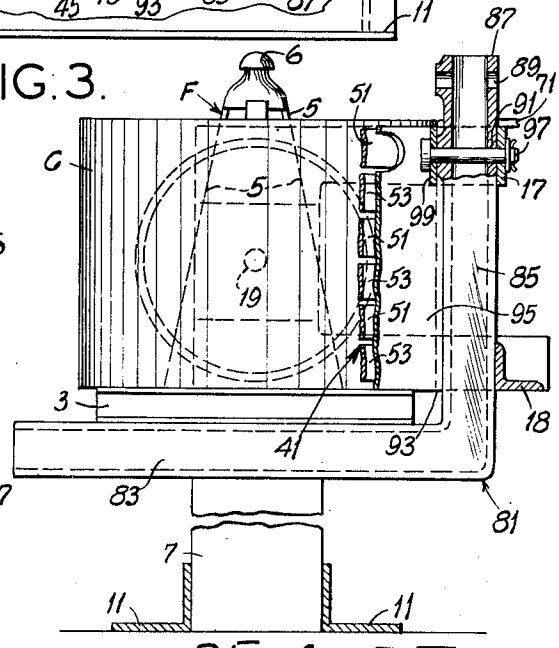


FIG. 3.



Stanley F. Jackes,
Ray H. Sheets,
Inventors.
Haynes and Koenig,
Attorneys.

Aug. 14, 1951 S. F. JACKES ET AL 2,564,436

APPARATUS FOR TURNING COILS OR THE LIKE

Filed Sept. 25, 1946 3 Sheets-Sheet 3

FIG. 7.

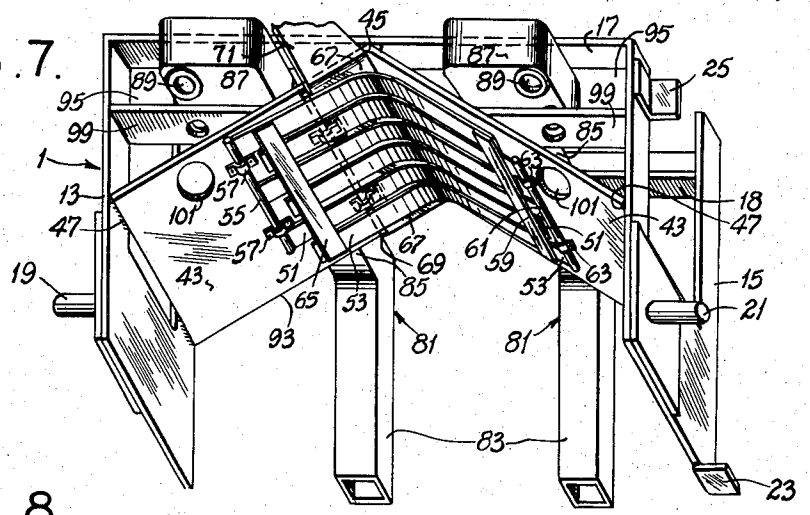


FIG. 8.

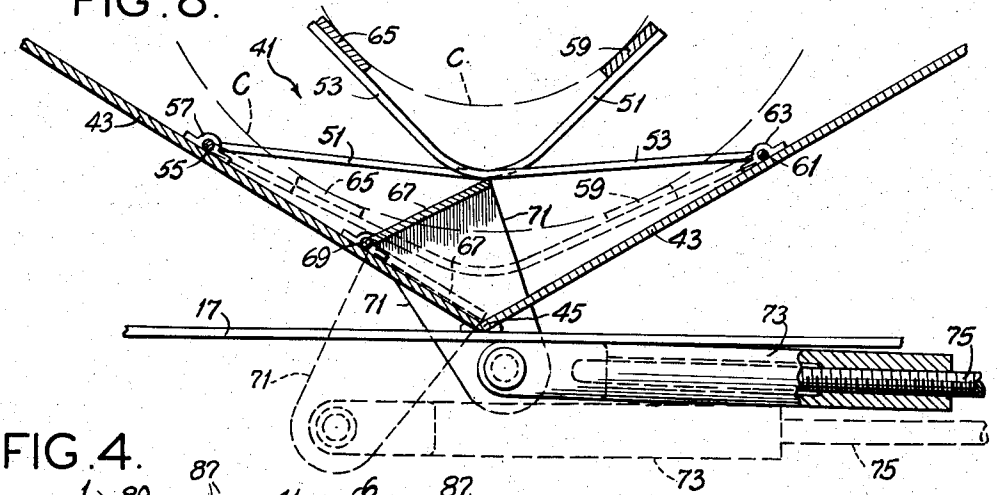
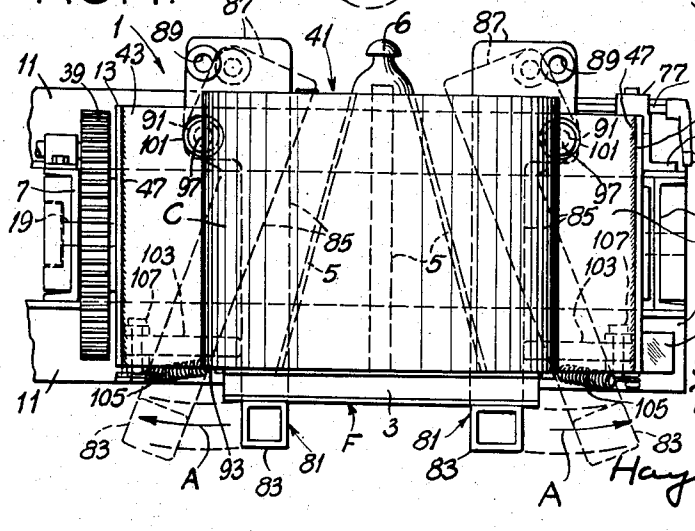


FIG. 4.



Stanley F. Jackes,
Ray H. Sheets,
Inventors.
Haynes and Koenig
Attorneys.

Patented Aug. 14, 1951

2,564,436

UNITED STATES PATENT OFFICE

2,564,436

APPARATUS FOR TURNING COILS OR THE LIKE

Stanley F. Jackes, University City, Mo., and Ray H. Sheets, Granite City, Ill., assignors to Jackes-Evans Manufacturing Company, St. Louis, Mo., a corporation of Missouri

Application September 25, 1946, Serial No. 699,260

5 Claims. (Cl. 214—1)

1

This invention relates to apparatus for turning coils or the like and, more particularly, to apparatus for turning such articles between up-ended, and horizontal positions.

Among the several objects of the invention may be noted the provision of improved apparatus for turning a coil or similar article from vertical up-ended position to a horizontal position resting on its side, and vice versa; the provision of apparatus of this class including supporting means for carrying a coil or the like by its lower end in up-ended position which is retractable from said end when the coil or the like is in horizontal position; the provision of apparatus such as described adapted to accommodate coils or the like of different sizes in proper balance; and the provision of apparatus of this class adapted for easy, reliable operation. Other objects will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structures hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which one of various possible embodiments of the invention is illustrated,

Fig. 1 is a plan view of the apparatus of this invention with the coil carrier thereof turned to carry a coil vertically;

Fig. 2 is a front elevation of Fig. 1 with the coil removed;

Fig. 3 is a section taken on line 3—3 of Fig. 1;

Fig. 4 is a plan view showing the coil carrier turned to carry a coil horizontally;

Fig. 5 is a front elevation of Fig. 4;

Fig. 6 is a right-end elevation of Fig. 5;

Fig. 7 is a perspective view of the coil carrier per se; and,

Fig. 8 is an enlarged section taken on line 8—8 of Fig. 2 illustrating details of an adjustable coil cradle.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

This invention is described herein particularly with reference to its use in turning coils of sheet metal, but it will be understood that it is adapted to handle other articles such as coils or rolls of other materials, reels, or any generally cylindrical articles such as sections of pipe or the like. The invention is particularly useful in association with coil handling apparatus such as disclosed in our copending application entitled Storage and

2

Conveying Means, Serial No. 699,476, filed September 26, 1946, adapted to convey up-ended coils from vertical storage stacks thereof to apparatus wherein the coils are to be mounted horizontally, being employed for turning the coils from vertical to horizontal position.

Referring now to the drawings, there is shown at 1 a carrier adapted to be positioned to receive a coil C carried on a sling F from a hoist-line implement (not shown) with the axis of the coil vertical. Sling F and the hoist-line implement are particularly described in our said copending application. For the purposes of this disclosure, it is to be noted that the sling comprises a coil-supporting platform 3 having a spindle 5 extending through the eye of the coil and provided with an undercut, grappling-hook-engaging knob 6.

The carrier 1 is pivotally mounted for vertical swinging movement in a supporting framework comprising a pair of vertical standards 7 and 9 joined by angle members 11.

The carrier comprises a generally U-shaped frame (note Fig. 7) made up of spaced side plates 13 and 15, a bottom plate 17, and a bottom angle member 18. This frame is pivotally mounted in the upper ends of the standards for rotation about a horizontal axis by means of trunnions 19 and 21 fixed to and extending laterally outward from the side plates adjacent their free forward edges. The frame is adapted to be swung through an arc of 90° from a position wherein bottom plate 17 is vertical (Figs. 1–3) to a position wherein plate 17 is horizontal with side plates 13 and 15 extending upward therefrom (Figs. 4–6). These positions are determined by a pair of limiting stops 23 and 25 on the frame cooperable with the standard 9.

Carrier 1 is preferably power-driven between the aforesaid positions, although it will be understood that it may be swung manually. As illustrated in Figs. 1 and 2, a platform 27 is carried by standard 7 and an additional standard 29. A reversible motor 31 and a speed reducer 33 are mounted on this platform, a belt drive 35 connecting the motor shaft and the input shaft of the speed reducer. The output shaft of the speed reducer is connected through a speed-reducing gear train 37 to a gear 39 fixed on trunnion 19 for rotating the carrier. Suitable controls and limit switches (not shown, being well known) are provided for motor 31 so that it may rotate carrier in either direction and stop when either of stops 23 or 25 engages standard 9, as will be readily understood. The carrier 1 has means mounted thereon for carrying a coil on

its side when in the Fig. 5 position and for carrying the coil vertically up-ended when in the Fig. 1 position.

The means for carrying a coil on its side comprises an adjustable coil cradle 41 mounted within the carrier in such manner as to receive the coil when the carrier is turned to the Fig. 5 position and which may be adjusted for centering coils of different diameters for a purpose to be described. Cradle 41 is carried on a shallow V-shaped base plate member 43 fixed within the carrier with its apex 45 abutting bottom plate 17 and angle 18 and its side margins secured to side plates 13 and 15 as by welding 47.

The cradle comprises two adjustable sets of curved fingers 51 and 53 which may be adjusted from a lowermost position on the base plate 43 wherein they carry a coil of largest diameter to be handled to raised positions for carrying coils of smaller diameters. Fingers 51 are secured as by welding at one end to a pin 55 pivotally retained on one wing of member 43 by clips 57. Pin 55 extends longitudinally of the cradle and fingers extend transversely therefrom across the apex of member 43, being spaced longitudinally on the pin. A longitudinal bar 59 is welded to the upper side of fingers 51 at their free ends. Fingers 53 are secured as by welding at one end to a pin 61 pivotally retained on the other wing of member 43 by clips 63. Pin 61 extends longitudinally of the cradle and fingers 53 are spaced longitudinally and extend transversely in intermeshing relation with fingers 51. A longitudinal bar 65 is welded to the upper side of fingers 53 at their free ends. The coil is carried by the bars 59 and 65 cradled therebetween.

Adjustment of the fingers 51 and 53 is effected by means of a camming bar 67 pivoted at 69 on member 43. This bar extends longitudinally under the fingers and is formed with an ear 71 at one end extending outward across the end of the cradle. A screw-threaded link 73 is pivoted to the ear. This link is adapted to be moved in one direction or the other to pivot the bar 67 by an operating rod 75 threaded in the link and journalled in a pivoted bearing 77 carried by the bottom plate 17 of the carrier 1. A hand crank 79 is fixed on the outer end of rod 75. It will be clear that when the crank and rod are turned to move link 73 to the right, as viewed in Fig. 8, bar 67 is pivoted counterclockwise to cam fingers 51 and 53 to elevate bars 59 and 65 to the position illustrated in full lines in Fig. 8.

The above cradle construction is such that bars 59 and 65 may be raised or lowered to carry coils of different diameters with the axis of a coil approximately intersecting the horizontal pivotal axis of the carrier 1 as defined by trunnions 19 and 21. The purpose of this adjustment is to enable a coil to be positioned with its center of gravity approximately on the horizontal pivotal axis of the carrier so as to reduce to a minimum the torque required to rotate the carrier. The arrangement is also such that coils of different diameters may all be turned to horizontal position with their axes at approximately the same height above the floor for convenience in handling.

The carrier 1 is also provided with means for carrying a coil on end which is retractable after the coil has been turned to horizontal position to permit removal of the coil sling F. This means comprises two L-shaped supporting brackets 81, the arms 83 of which provide supporting means for carrying a coil on end when the carrier is in the position of Fig. 1. The other arms 85 of the brackets form levers for pivoting arms 83 in such a way that they are laterally retractable from coil-carrying position to a retracted position to clear the end of the coil so that the sling may be withdrawn.

Each arm 85 is formed with an enlarged head 87 at its free end, the head having upper and lower apertures 89 and 91, respectively, offset laterally outward from the plane of the bracket. The brackets are identical except that the head of one bracket is reversed with respect to the other so that the heads extend laterally outward. One arm 85 extends from the lower end 93 of the cradle 41 under the cradle in the space 95 between member 43 and the bottom plate 17 and angle 18 on one side of the carrier. The other arm 85 is similarly disposed in space 95 at the other side of the carrier. The arms 85 are pivoted on axes parallel to the planes of the bracket but offset outward therefrom on pivot pins 97. These pins may extend either through apertures 89 or through apertures 91 in the heads 87.

As illustrated herein, pins 97 extend through apertures 91. These pins are removably mounted in the carrier, extending through aligned apertures provided in web plates 99 and the bottom plate 17 of the carrier. Web plates 99 are welded at their ends to the side plates 13 and 15 of the carrier and to the member 43 adjacent the upper end of the cradle. The pins 97 may be withdrawn from heads 87, apertures 101 being provided in member 43 for access to the pins, and brackets 81 repositioned with pins 97 extending through apertures 89 to lower arms 83 relative to the cradle to carry wider coils with the center of gravity of the coil approximately on the horizontal pivotal axis of the carrier.

The brackets 81 are swingable laterally outward on the axes of pins 97 from the solid-line position of Figs. 4 and 5 wherein arms 83 extend upward from the end 93 of the cradle in parallelism and spaced apart a distance less than the width of the platform 3, to the dotted-line position of these figures wherein arms 83 are spaced apart a greater distance than the width of the platform 3 so that the sling may be withdrawn from the coil. The first of these positions constitutes the position of arms 83 for carrying the coil on end, and the second is the retracted position for clearing the end of the coil. The brackets are adapted to be retained in the first position by means of latch blocks 103 pivoted at 107 on carrier 1 and engageable with the sides of arms 85. These blocks are biased by over-centering tension springs 105 to a position against plate 17 wherein they engage arms 85 to maintain coil-supporting arms 83 in the Fig. 2 position. They may be swung away from base plates 17 against the side plates 13 and 15 to permit the brackets to be swung laterally outward. In this latter position the springs 105 are over-centered to bias the blocks to said position. It will be understood that when latch blocks 103 are in the Fig. 2 position, the brackets are gravity-biased into engagement therewith. Arms 85 abut base plate 17 and slide thereon in the course of their swinging movement. The weight of the brackets is thus borne by the bottom plate 17 and angle member 18 when the cradle is horizontal.

The pivots 97 for the brackets 81 are offset laterally outward from the planes of the brackets so that arms 83 swing endwise to a certain extent away from the platform 3 of the coil sling in their lateral outward movement. This is il-

lustrated in Fig. 4 by the arcs A. This permits arms 83 to be swung to clear the platform 3.

Operation is as follows:

The motor 31 is energized to rotate the carrier 1 to the position of Figs. 1–3 wherein the cradle 41 is vertical and coil-supporting arms 83 extend horizontally outward and forward from the lower end 93 of the cradle in position to carry a sling F and a coil thereon by the lower end thereof. Arms 83 are retained in this position by swinging latch blocks 103 to engage the levers 85. The cradle 41 is adjusted by turning crank 79 to position bars 59 and 65 at the proper elevation above plate member 43 so that the coil to be turned will ultimately rest on its side in the cradle with its axis approximately intersecting the horizontal pivotal axis of the carrier 1. Brackets 81 are pivoted with pins 97 extending through the appropriate apertures 89 or 91 according to the width of the coil to be handled so that the center of gravity of the coil will be approximately in said pivotal axis.

The sling F with coil C thereon is deposited on the arms 83 by a hoist-line implement (not shown) such as disclosed in our aforesaid copending application with platform 3 of the sling resting on the arms. After the implement has been disengaged from the knob 6 of the sling, motor 31 is energized to rotate the carrier 1 through 90° to the position of Figs. 4–6 wherein the cradle 41 is horizontal and arms 83 extend upward from the forward end thereof. Latch blocks 103 are swung on their pivots out of abutting relation to arms 85, and the brackets are then manually swung laterally outward to the dotted-line position of Figs. 4 and 5. In this position, supporting arms 83 are clear of the platform 3 of the sling, and the sling may be pulled out of the coil.

Thus, the turning apparatus of this invention is adapted to receive a coil on end, turn it to a horizontal position resting on its side, and also to permit retraction of the support for the end of the coil to clear said end for removal of a coil supporting sling or for any other desired purpose. It will be understood that the turning apparatus is also adapted for reversal of this procedure, i. e., to receive a coil horizontally with the arms 83 retracted so that a sling may be inserted in the coil, then to have arms 83 moved to coil-carrying position, and the carrier 1 turned to bring the coil to vertical position, resting on end on arms 83, whereupon it may be hoisted above the turning apparatus by means of the sling. The apparatus is adjustable to accommodate coils of different diameters and widths in proper balance by reason of the provision for adjustability of cradle 41 in accordance with the coil diameter and the provision for adjustability of brackets 81 in accordance with coil width to position the center of gravity of the coil approximately in the pivotal axis of the carrier 1.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

We claim:

1. In apparatus of the class described, a carrier comprising a cradle for carrying an article such as a coil or the like horizontally on its side, means pivotally mounting said cradle for vertical swinging movement between horizontal and vertical positions, L-shaped brackets each having an article-carrying arm normally extending forward from one end of the cradle for carrying the article by its lower end in vertical up-ended position when the cradle is in vertical position, the other arm of each bracket extending beneath the cradle and having its free end pivoted on said carrier on an axis substantially parallel to but offset outward from the plane of said bracket, whereby said article-carrying arms may be swung laterally outward away from article-carrying position to a retracted position clearing said end of the article when the cradle is in horizontal position.

2. In apparatus of the class described, a carrier comprising a cradle for carrying an article such as a coil or the like horizontally on its side, means pivotally mounting said cradle for vertical swinging movement between horizontal and vertical positions, L-shaped brackets each having an article-carrying arm normally extending forward from one end of the cradle for carrying the article by its lower end in vertical up-ended position when the cradle is in vertical position, the other arm of each bracket extending beneath the cradle and having its free end pivoted on said carrier on an axis substantially parallel to but offset outward from the plane of said bracket, whereby said article-carrying arms may be swung laterally outward away from article-carrying position to a retracted position clearing said end of the article when the cradle is in horizontal position, and releasable means for retaining said article-carrying arms in article-carrying position.

3. Apparatus for turning coils comprising a carrier including a cradle for carrying a coil horizontally on its side, means pivotally mounting said carrier and cradle for vertical swinging movement about a horizontal axis offset from said cradle to swing the cradle between horizontal and vertical positions, supporting means extending forward from the lower end of the cradle for carrying the coil by its lower end in vertical up-ended position when the cradle is vertical, and means whereby said supporting means may be selectively positioned at different distances from said horizontal pivotal axis for positioning coils of different widths with their centers of gravity approximately in said pivotal axis, said supporting means being mounted on said carrier for relative movement with respect to the cradle away from coil-carrying position to a retracted position clearing the lower end of the coil when the cradle is horizontal.

4. Apparatus for turning coils comprising a carrier including a cradle for carrying a coil horizontally on its side, means pivotally mounting said carrier and cradle for vertical swinging movement about a horizontal axis offset from said cradle to swing the cradle between horizontal and vertical positions, coil end-supporting means extending forward from the lower end of the cradle for carrying the coil by its lower end in vertical up-ended position when the cradle is vertical, said cradle comprising coil-supporting means adjustable toward and away from said horizontal pivotal axis, and means whereby said end-supporting means may be selectively positioned at different distances from said pivotal axis so that coils of various diameters and widths may be positioned with their centers of gravity approximately in said pivotal axis, said supporting

means being mounted on said carrier for relative movement with respect to the cradle away from coil-carrying position to a retracted position clearing the lower end of the coil when the cradle is horizontal.

5. Apparatus for turning coils comprising a carrier including a cradle for carrying a coil horizontally on its side, means pivotally mounting said carrier and cradle for vertical swinging movement about a horizontal axis offset from said cradle to swing the cradle between horizontal and vertical positions, said cradle comprising transversely spaced coil-supporting bars adapted to cradle a coil therebetween, said bars being pivoted on said carrier for adjustment toward and away from said horizontal pivotal axis for positioning coils of different diameters with the axis of a coil approximately intersecting said pivotal axis, and means mounted on said carrier for adjusting said bars.

STANLEY F. JACKES.
RAY H. SHEETS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
261,956	Rinker	Aug. 1, 1882
2,178,369	Dunham	Oct. 31, 1939
2,232,045	Berthold et al.	Feb. 18, 1941
2,287,469	Cochran	June 23, 1942
2,418,693	Breslav	April 8, 1947
2,426,569	Stewart	Aug. 26, 1947