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COIL HANDLING CRANE

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Fig. 2.

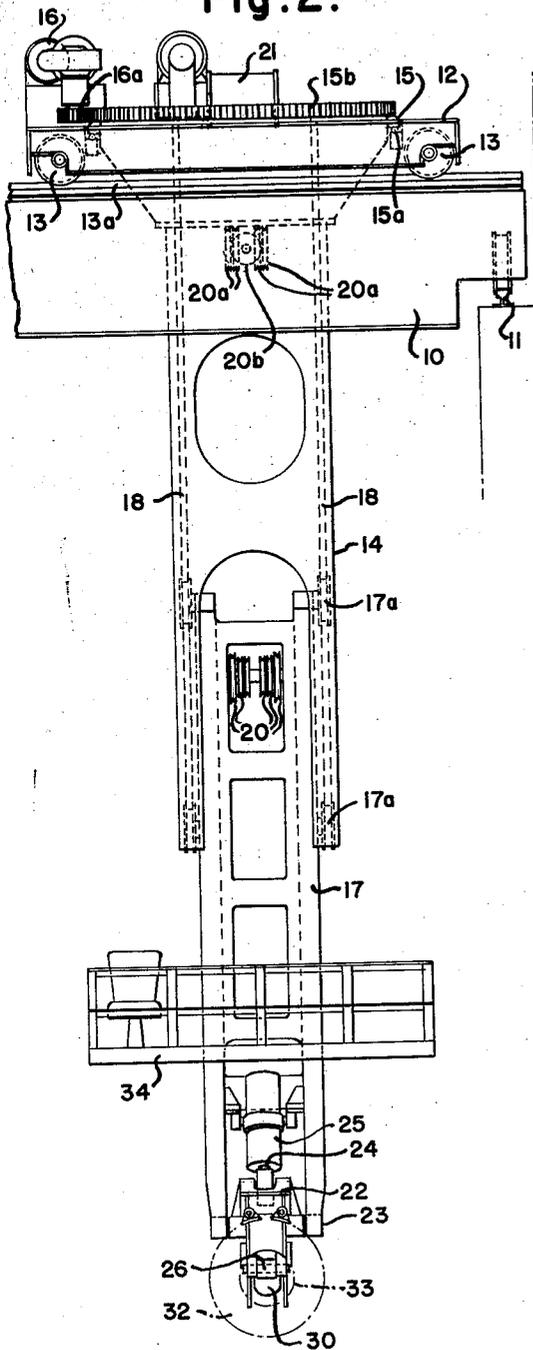
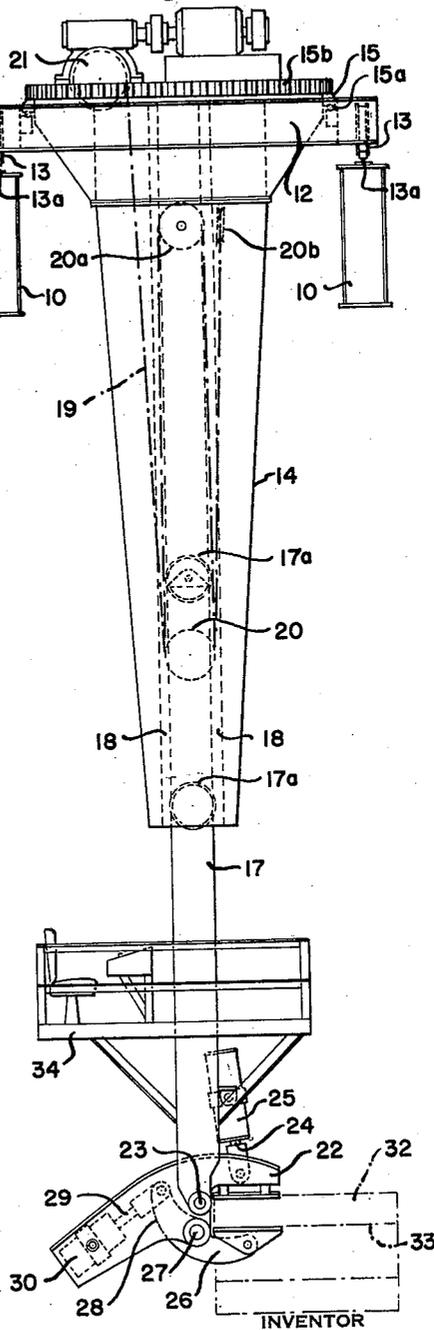


Fig. 1.



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COIL HANDLING CRANE

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This invention relates to coil handling cranes and particularly to a crane structure for handling coils of varying heights without injuring the surface of the coil so as to place them for storage at any desired level. There has for a long time been a need for a coil handling mechanism for positioning, handling and transferring metal coils from one location to another in the mill as well as in the warehouse. It has been the practice to provide conveyor lines and the like for moving the coils from one location to another. No satisfactory means has, however, been available for storing these coils, particularly at multiple heights. The problem of handling metal coils is accentuated by the fact that coils may be stored with their axis vertically or horizontally, or may be received on a transfer conveyor with the axis either vertically or horizontally.

I provide a coil handling mechanism structure capable of overcoming the problems outlined above. The coil carrying crane of the present invention will satisfactorily pick up and store coils with their axes in any desired direction without injury to the coil. Moreover, the structure of this invention eliminates the need for aisles or roadways in which lift trucks might operate and thereby makes more economic use of available floor space.

Preferably, I provide a track supported above an area where the coil handling is to take place, movable bridge means traversable along the track over said area, carrier means on the bridge means movable thereon transversely to the track, hoisting means on the carrier means, frame means depending from the hoisting means and movable in a vertical direction thereby on guideways on the carrier means, vertically extensible means rotatably mounted in the frame means for rotation through 360°, means on the carrier acting on the frame means to rotate said frame means and extensible means, spaced jaws rotatable about a common axis on the end of the extensible means, one of said jaws being adapted to enter the eye of a coil whereby the coil is engaged between the jaws, means acting on the jaws to bring them together to frictionally engage the coil between them and means for rotating the jaws in use about their common axis. Preferably, the jaws are mounted on the bottom of the extensible means on a common axis. An hydraulic piston is fixed in the extensible means acting on the jaws to rotate them in unison about said common axis. A second hydraulic means is provided on the jaws acting thereon to bring them together to bear on the coiled wall.

I have set out certain objects, advantages and purposes of this invention in the foregoing general description. Other objects, purposes and advantages will be apparent from a consideration of the following description and the accompanying drawings in which,

FIGURE 1 is a side elevation of a coil handling crane according to the invention with the jaws engaging a coil whose axis is in the horizontal position; and

FIGURE 2 is an end elevation of the coil handling crane of FIGURE 1.

Referring to the drawings, I have illustrated a traveling bridge 10 mounted on rails 11 on opposite sides of the coil handling area. A trolley 12 is mounted on wheels 13 which engage rails 13a on the bridge 10 for travel thereon transverse to rails 11. The trolley 12 carries a frame 14 depending therefrom and mounted

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in a rotating ring 15. The ring 15 is mounted on rollers 15a and is rotatable on trolley 12 by means of a motor 16 driving ring gear 15b through spur gear 16a. A telescoping extensible column 17 is mounted on wheels 17a which are adapted to run between vertical guide rails 18 in frame 14 and is vertically movable therein by means of hoisting cables 19. The cables 19 pass from a drum 21 around sheaves 20 in the extensible column 17 and sheaves 20a on the frame 14 in multiplying relationship. The cables are then passed over an equalizing idler pulley 20b and over sheaves 20 and 20a and back to drum 21. Drum 21 is driven by a motor on the frame 14. This permits the member 17 to telescope into and out of the frame 14.

A jaw 22 is pivoted on a shaft 23 at the bottom of the extensible column. An hydraulic piston 24 is connected to the jaw 22 at a point spaced from the axis 23 so that extension of the piston 24 out of a cylinder 25 fixed to the extensible means 17 causes the jaw 22 to rotate about axis 23. A second jaw 26 is pivoted about a shaft 27 in jaw 22. The jaw 26 is provided with a bell crank arm 28. An hydraulic piston 29 actuated by cylinder 30 fixed to jaw 22 rotates the jaw 26 about its axis 27 spaced from axis 23 of jaw 22.

In operation, the hydraulic cylinder 25 is actuated to rotate jaw 22 and its accompanying parts to position in line with the outside of the coil 32 to be picked up. Cylinder 30 is actuated to open jaw 26 to a position where it will enter the eye 33 of the coil 32. The extensible column 17 is then moved by moving the trolley to bring the jaw 26 within the coil eye 33. Cylinder 30 is then actuated to close jaw 26 against the coil and to bring it into frictional engagement between jaw 26 and jaw 22. The extensible column 17 is then moved in the vertical direction to raise or lower the coil as the case may be. Cylinder 25 may be actuated to carry the axis of the coil from a horizontal to a vertical plane or vice versa. The horizontal position of the coil eye may be rotated through 360° by rotation of the ring 15 on carrier 12. A platform 34 is mounted on the extensible column 17 adjacent the jaw 22. The platform 34 provides a convenient location for the operator and for the operating controls which are of conventional design.

It is evident from the foregoing description that the coil handling crane of this invention provides extreme flexibility for handling and positioning coils in any area. It may be used to pick up coils in any position and to store them in any position. It may also be used to store coils at any desired height beneath the traveling bridge. The great flexibility of the present invention eliminates all the problems which have heretofore characterized the coil handling art and provides the utmost in flexibility while providing a device which will not damage the coil edges or surfaces.

While a preferred embodiment of the present invention has been illustrated and described herein, it will be understood that this invention may be otherwise embodied within the scope of the following claim.

I claim:

A coil handling mechanism comprising a track supported above a coil handling area, movable bridge means movable on said track over said area, carrier means on said bridge means movable thereon transversely to the track, frame means depending from the carrier means and rotatable therein through 360°, vertically extensible means mounted in the frame means for vertical movement therein, drive means on one of the frame and carrier means rotating the frame means, a pair of jaws rotatable about a common shaft at the end of the extensible means, one of said jaws being adapted to enter a coil eye to be lifted, a hydraulic cylinder mounted in the

other of said jaws, a piston in said hydraulic cylinder, a bell crank arm on said one piston engageable with the piston to be actuated for movement toward the other jaw, a second hydraulic cylinder on the extensible means, a piston in said second hydraulic means operatively connected to the said other jaw whereby to move said jaw about its axis thereby carrying said one jaw and the coil selectively between a horizontal and a vertical position.

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References Cited in the file of this patent

UNITED STATES PATENTS

660,477	Wellman -----	Oct. 23, 1900
1,236,089	Kendall -----	Aug. 7, 1917
2,725,996	Britton -----	Dec. 6, 1955
2,732,083	Smith -----	Jan. 24, 1956
2,817,450	Ulinski -----	Dec. 24, 1957
2,821,318	Kendall -----	Jan. 28, 1958