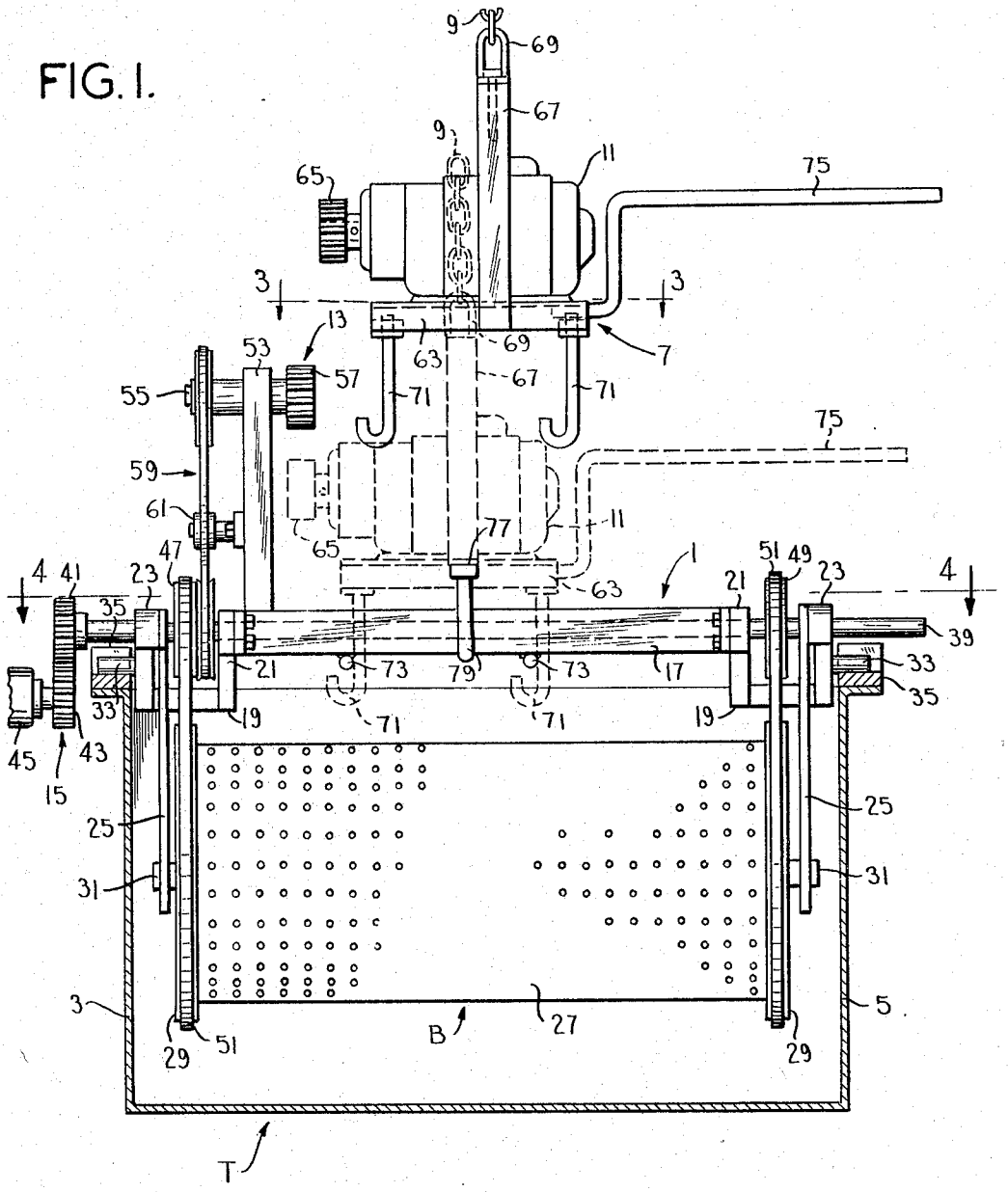
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PLATING BARREL SUSPENSION

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FIG. 1.



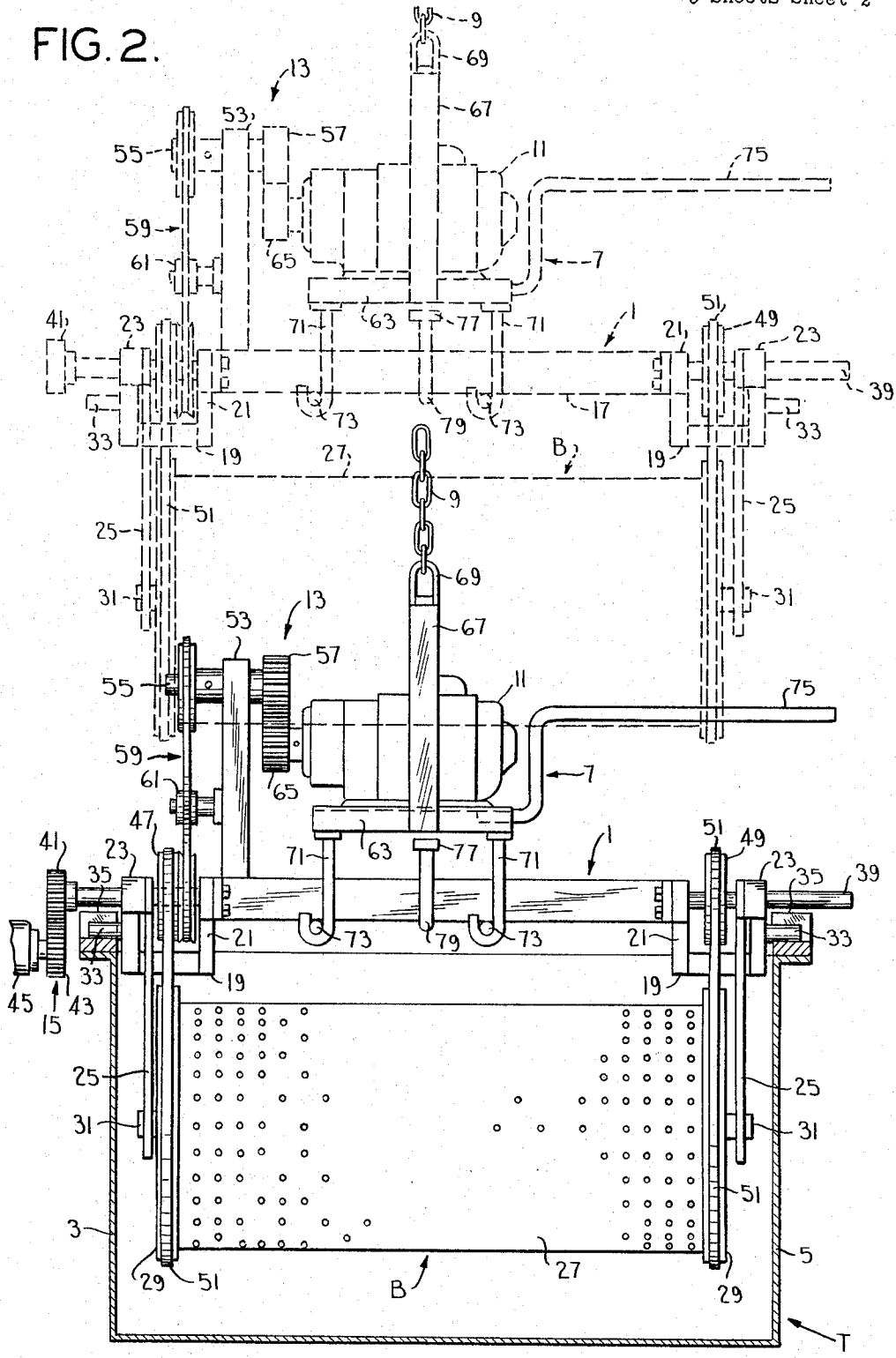
Leonard P. Kumpf,
Inventor.
Koenig, Senniger, Powers and Leavitt,
Attorneys.

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FIG. 2.



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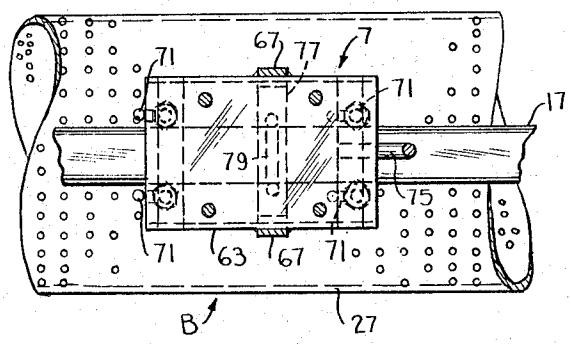


FIG.3.

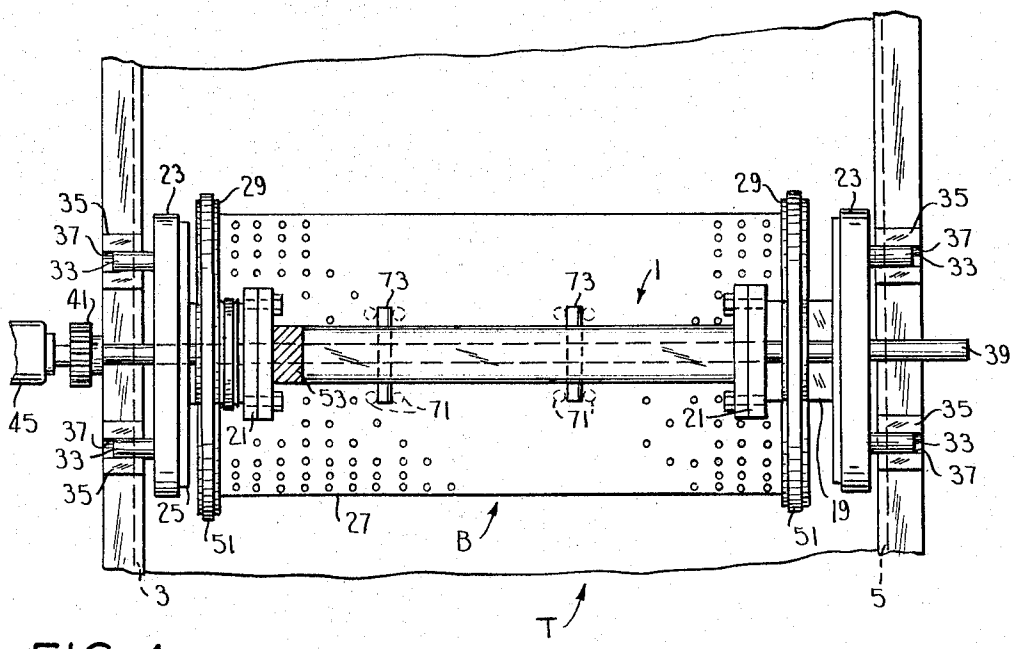


FIG.4.

United States Patent Office

3,286,718

Patented Nov. 22, 1966

3,286,718

PLATING BARREL SUSPENSION

Leonard P. Kumpf, Affton, Mo., assignor to Lasalco Incorporated, St. Louis, Mo., a corporation of Missouri

Filed Nov. 13, 1964, Ser. No. 411,061
13 Claims. (Cl. 134—140)

This invention relates to plating apparatus, and more particularly to a plating barrel suspension for transporting a plating barrel.

In certain plating operations, work to be plated is loaded into a work-tumbling barrel and the barrel with the work therein is successively lowered into each of a series of tanks for various treatments required for plating the work, e.g., cleaning, plating, rinsing. Lifting, lowering and transporting of the barrel is accomplished by a hoist, such as an overhead traversing hoist. It is desirable that the barrel be rotated for tumbling the work while in a tank, and also when it is lifted from a tank to insure drainage of substantially all liquid from the barrel back into the respective tank, thereby to avoid carrying liquid from one tank to another.

Accordingly, among the several objects of this invention may be noted the provision of a barrel suspension, adapted for being raised, lowered and traversed by a hoist, which includes means for rotating the barrel suspended therefrom, so that the barrel may be rotated when lifted out of a tank; the provision of a suspension such as described which comprises a carrier for the barrel and a sling adapted to be suspended from a hoist, the carrier being adapted to be detachably suspended from the sling, with means for driving the barrel when the carrier is suspended from the sling including a motor on the sling, the sling being detachable from the carrier and independently transportable by the hoist for association with other carriers, whereby the motor on the sling may serve for a plurality of carriers; and the provision of a suspension such as described enabling easy coupling of the sling and barrel drive to a carrier and easy uncoupling of the sling and barrel drive from a carrier. Other objects and features will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the constructions hereinafter described, the scope of the invention being 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 view showing a plating barrel suspension of this invention, illustrating in solid lines the sling thereof disengaged and raised from the carrier, and illustrating in dotted lines how the sling is engaged with the carrier;

FIG. 2 is a view similar to FIG. 1, showing in solid lines the sling engaged with the carrier for lifting the carrier out of a tank, and showing in dotted lines the lifted sling and carrier;

FIG. 3 is a section on line 3—3 of FIG. 1; and

FIG. 4 is a section on line 4—4 of FIG. 1.

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

Referring to the drawings, a barrel suspension of this invention is shown to comprise a barrel carrier generally designated 1 adapted to be lowered to a position such as shown in solid lines in FIGS. 1 and 2 spanning two

opposite walls 3 and 5 of a tank T, and adapted to be lifted from this position. The carrier has means for rotatably supporting a barrel B with the barrel in the tank when the carrier is lowered. At 7 is indicated a sling adapted to be suspended by a chain 9 of a hoist (not shown) such as an ovehead traversing hoist. The sling and carrier have coacting means thereon for disengageably and detachably suspending the carrier from the sling. Means is provided for driving the barrel when the carrier is suspended from the sling comprising a motor 11 on the sling with a disengageable and detachable driving connection at 13 in the drive between the motor and the barrel permitting disengagement and detachment of the sling from the carrier. Means indicated generally at 15 is also provided for driving the barrel independently of the motor 11 when the carrier is lowered to its solid-line position of FIGS. 1 and 2.

More particularly, the carrier 1 comprises an elongate hollow beam 17 having a U-shaped open frame member 19 at each end thereof. The inner leg of each U-shaped member is designated 21, and its outer leg is designated 23. The inner leg 21 of each U-shaped member is secured adjacent its upper end to the respective end of the beam. Extending down from the outer legs 23 of the U-shaped members (which are wider than the inner legs as appears in FIG. 4) are hangers 25. The barrel B comprises a perforated drum 27 having end heads 29 provided with trunnions 31 detachably journalled in the hangers 25 adjacent the lower ends of the hangers. Each end head 29 is formed as a pulley. Projecting outward from the outer side 23 of each U-shaped member is a pair of studs 33. The walls 3 and 5 of the tank have saddle blocks 35 at the top provided with notches 37 for cradling the studs to support the beam 17 in position spanning the walls of the tank, with members 25 extending down adjacent the inside of walls 3 and 5.

A shaft 39 extends through the hollow beam 17, being journalled in the legs of the U-shaped members 19. The ends of the shaft extend outward beyond the outer legs 23 of members 19 over the saddle blocks 35. Secured on one end of this shaft (its left-hand end as shown) is a spur gear 41 which constitutes an element in the drive 15 for the barrel. Drive 15 is established via meshing of gear 41 with a spur gear 43 driven from a suitable power source, such as the output shaft of an electric motor-speed reducer unit fragmentarily indicated at 45 in FIGS. 1, 2 and 4. Gear 43 is so located relative to notches 37 in the saddle blocks that gear 41 on shaft 39 comes into mesh with the gear 43 on entry of studs 33 in the notches. Drive 15 may be referred to as an outside drive. Shaft 39 has a pair of pulleys 47 and 49 secured thereon in the spaces provided therefor between the legs of the U-shaped members 19, and endless belts 51 are trained around these pulleys and the pulley-form barrel end heads 29 for effecting rotation of the barrel via drive 15 and shaft 39 when the carrier 1 is in its lowered position spanning tank walls 3 and 5.

Extending up from beam 17 adjacent its left end as shown in FIGS. 1 and 2 is a post 53. Journalled in the upper end of this post on a horizontal axis extending parallel to the beam is a stub shaft 55 carrying a spur gear 57 on its inner end adjacent the post. Gear 57 constitutes a driven member of connection 13. A belt and pulley drive indicated at 59 interconnects shafts 55 and 39. A belt-tensioning idler roll for drive 59 is indicated at 61. A slip clutch (not shown) may be interposed between shaft 55 and the pulley on shaft 55 for gear protection purposes.

Sling 7 comprises a base or pad 63 on which motor 11 is mounted. Motor 11 has a speed reducer associated therewith on the output shaft of which is a spur gear 65 adapted for meshing engagement with gear 57 as a driving member for the latter to constitute the aforementioned disengageable driving connection 13. Extending up from the base 63 on opposite sides of the motor are straps 67 having an eye 69 at their upper end for attachment of chain 9. Extending down from the base are two pairs of sling hooks 71 which are adapted to straddle the beam 17 and adapted for hooking engagement with two pins 73 welded to the bottom of the beam and extending transversely of the beam. A handle 75 is provided for the sling, extending up and then horizontally outward on the side of the base opposite pinion 65. Base 75 is engageable with a rest 77 carried by a U-shaped support 79 secured to the beam 17.

The spacing of the pairs of hooks 71 lengthwise of the beam 17 and the length of the hooks in relation to the height of gear 57 above the beam are such as to enable the sling 7 to be lowered from its solid-line position of FIG. 1 to a position wherein the base of the sling engages rest 77 with the sling somewhat to the right of its FIG. 1 dotted-line position and wherein the hooks straddle the beam with the lower ends of the hooks offset to the right of and below the pins. Then, by use of the handle 75, the sling may be pushed to the left to its dotted-line position of FIG. 1 wherein the lower ends of the hooks are below the pins, and wherein gear 65 is directly below gear 57. Then, by operation of the hoist, the sling may be raised to its solid-line position of FIG. 2, wherein the lower ends of the hooks are hooked to pin 73 and gear 65 meshes with gear 57. This couples the sling and carrier 1 together in two respects, for lifting of the carrier by the sling when the hoist is operated to raise them, and for driving of the barrel B from motor 11 on the sling via pinion 65, gear 57, shaft 55, belt and pulley drive 59, shaft 39 and belts 51. The drive for the barrel is maintained when the coupled sling and carrier are raised to lift the barrel out of the tank as shown in dotted lines in FIG. 2.

When a carrier 1 is in its lowered position spanning the walls 3 and 5 of the tank, the sling 7 may be uncoupled therefrom by lowering the sling from its FIG. 2 solid-line position to its FIG. 1 dotted-line position, then shifting the sling to the right to clear the hooks 71 from the pins 73 and to clear gear 65 from gear 57, and then raising the sling to a position such as shown in solid lines in FIG. 1. When the sling is uncoupled from the carrier, the barrel may be driven via the outside drive 15 to effect rotation thereof while in the tank independently of the sling. The sling may then be transported via the hoist, coupled to another carrier, and employed to lift the latter and effect rotation of the barrel carried thereby while it is lifted, and to transport it to another position.

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

As various 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.

What is claimed is:

1. A plating barrel suspension comprising a carrier adapted to be lowered to a position spanning two opposite walls of a tank and adapted to be lifted from said position, said carrier having means for rotatably supporting a barrel with the barrel in the tank when the carrier is lowered, a sling adapted to be suspended from a hoist, said sling and said carrier having coacting means thereon for detachably coupling the carrier and the sling, and means for driving the barrel when the carrier and sling are coupled comprising a motor carried by the sling and a disengageable and detachable driving connection between the motor and the barrel comprising a driving member on the sling driven by the motor and a driven member on the carrier connected to the barrel, said driving member coming into engagement with the driven member when the sling is coupled to the carrier and said driving member disengaging from the driven member when the sling is uncoupled from the carrier.

2. A plating barrel suspension as set forth in claim 1 having means associated with the carrier for driving the barrel independently of the motor on the sling.

3. A plating barrel suspension as set forth in claim 1 wherein said coacting means comprises disengageable hook and pin means on said sling and carrier.

4. A plating barrel suspension as set forth in claim 1 wherein said driving member comprises a gear driven by said motor and said driven member comprises a gear on the carrier disengageably in mesh when the carrier and sling are coupled.

5. A plating barrel suspension comprising a carrier adapted to be lowered to a position spanning two opposite walls of a tank and adapted to be lifted from said position, said carrier having means for rotatably supporting a barrel with the barrel in the tank when the carrier is lowered, a shaft carried by the carrier, means for driving the barrel from the shaft, a sling adapted to be suspended from a hoist and detachably coupled to the carrier, a motor carried by the sling, and means for driving the shaft from the motor to drive the barrel from the motor including a disengageable and detachable driving connection permitting uncoupling of the sling from the carrier, said disengageable driving connection comprising a driving member on the sling driven by the motor and a driven member on the carrier connected to the shaft, said driving member coming into engagement with the driven member when the sling is coupled to the carrier and said driving member disengaging from the driven member when the sling is uncoupled from the carrier.

6. A plating barrel suspension as set forth in claim 5 having means on the shaft for connection to an outside drive when the carrier is in said lowered position for driving the barrel independently of the motor.

7. A plating barrel suspension as set forth in claim 5 wherein the sling and carrier are detachably coupled by means of disengageable hooks and pins.

8. A plating barrel suspension as set forth in claim 7 wherein the hooks are on the sling and the pins are on the carrier.

9. A plating barrel suspension as set forth in claim 5 wherein said driving member comprises a gear driven by said motor and said driven member comprises a gear on the carrier with a drive from the latter gear to the shaft, said gears being disengageably in mesh for uncoupling of the sling from the carrier.

10. A plating barrel suspension comprising a hollow beam having open frame members at its ends, means extending from said end members of the beam for supporting the beam in a lowered position spanning two opposite walls of a tank, hangers depending from the end members for rotatably supporting a barrel, a first shaft extending through said beam and said end members, means for driving the barrel from said first shaft, said beam having pins extending transversely thereof, a sling adapted to be suspended from a hoist having hooks depending therefrom straddling the beam and disengageably hooked to said pins, a motor unit on the sling, a gear on the output shaft of the motor unit, a post extending upward from the beam, a second shaft journalled in the post, a gear on said second shaft disengageably in mesh with the gear on the output shaft of the motor unit, and a drive from said second shaft to the first shaft.

11. A plating barrel suspension as set forth in claim 10 wherein the means for driving the barrel from said first shaft comprises belt and pulley drives including pulleys secured on said first shaft within said open frame end members.

12. A plating barrel suspension as set forth in claim 11 wherein the drive from the second shaft to the first shaft is a belt and pulley drive including a pulley secured on

the first shaft within one of said open frame end members.

13. A plating barrel suspension as set forth in claim 10 wherein the first shaft has a gear on one end thereof for being driven from an outside drive when the beam is in said lowered position.

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CHARLES A. WILLMUTH, *Primary Examiner.*

ROBERT L. BLEUTGE, *Assistant Examiner.*