

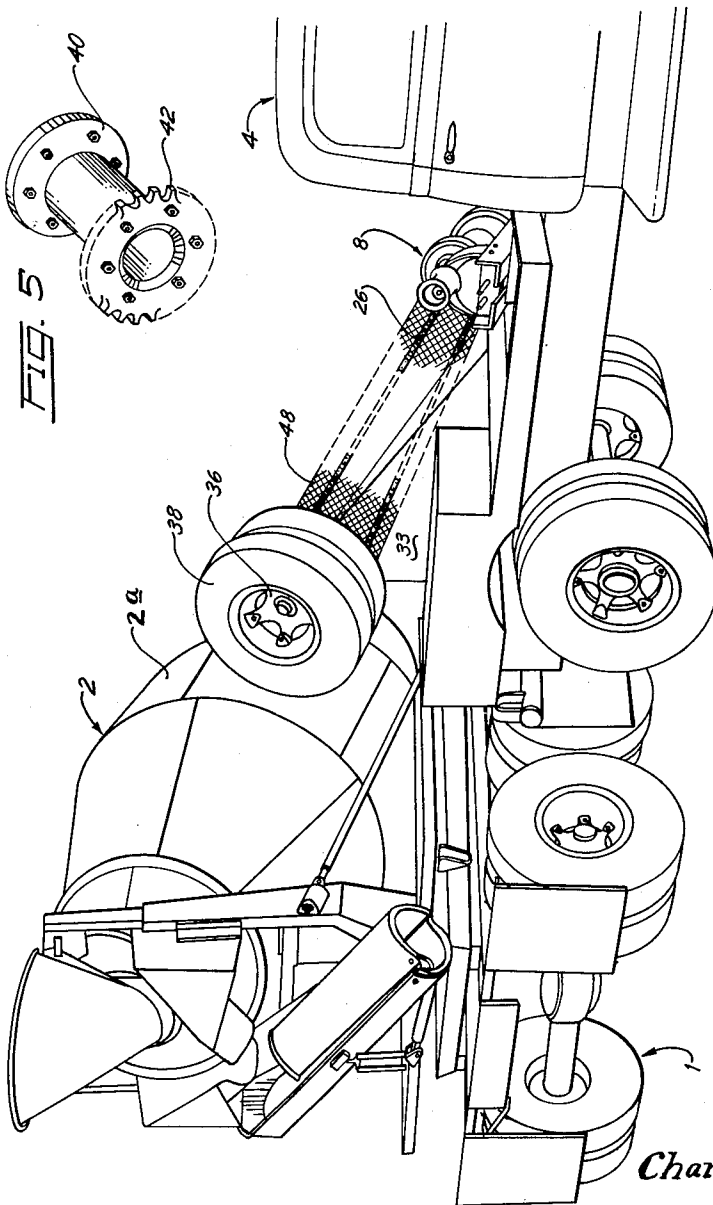
June 9, 1964

C. C. PITTS
EMERGENCY, AUXILIARY FRICTION DRIVE
FOR TRUCK MOUNTED CONCRETE MIXER

3,136,165

Filed March 5, 1962

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

FIG. 2

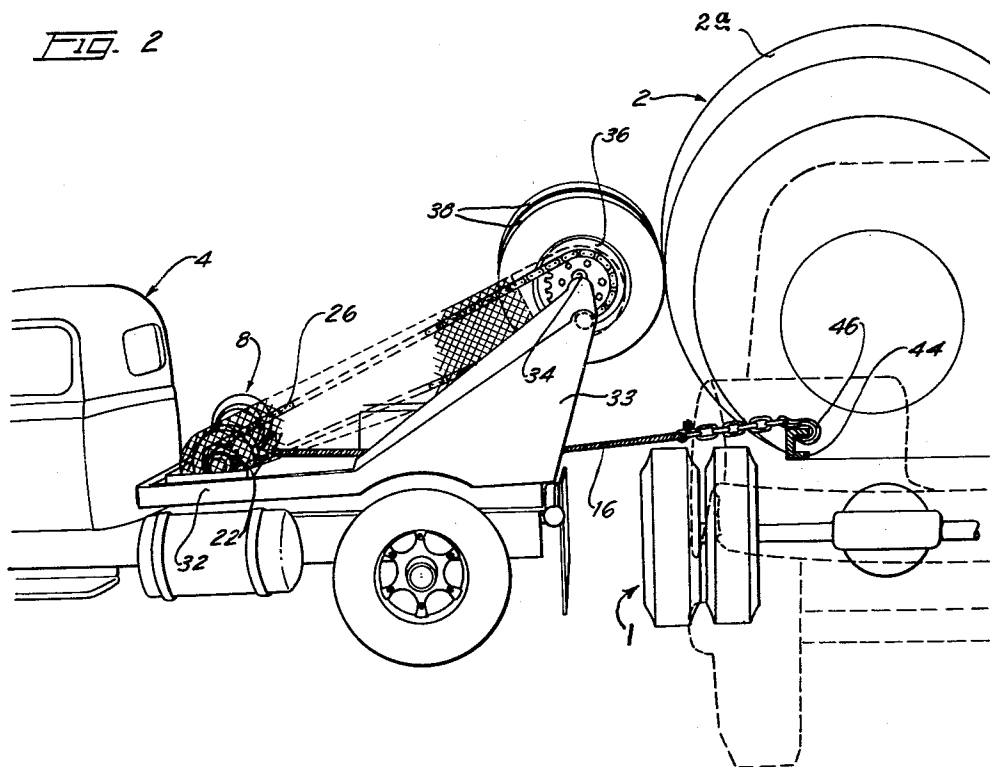
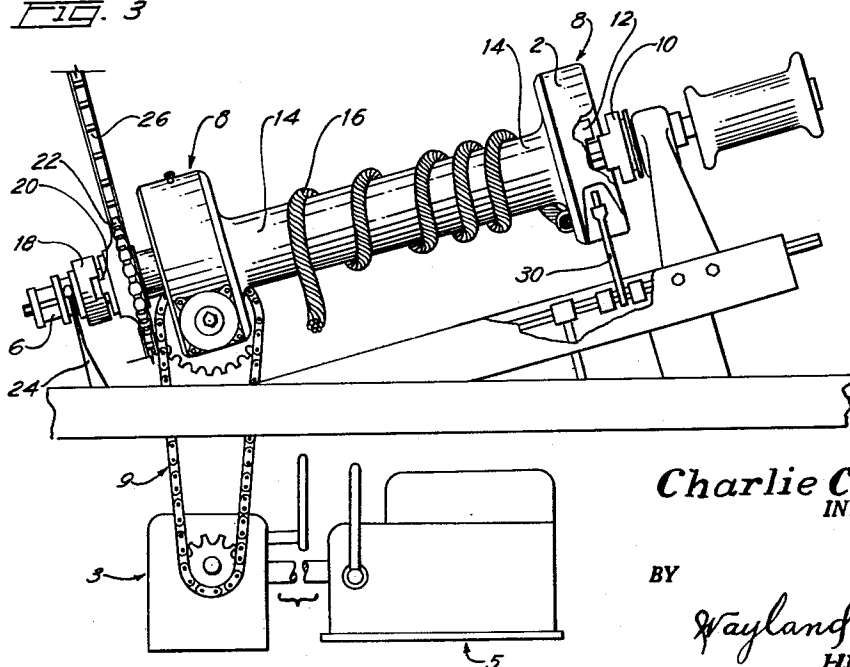


FIG. 3



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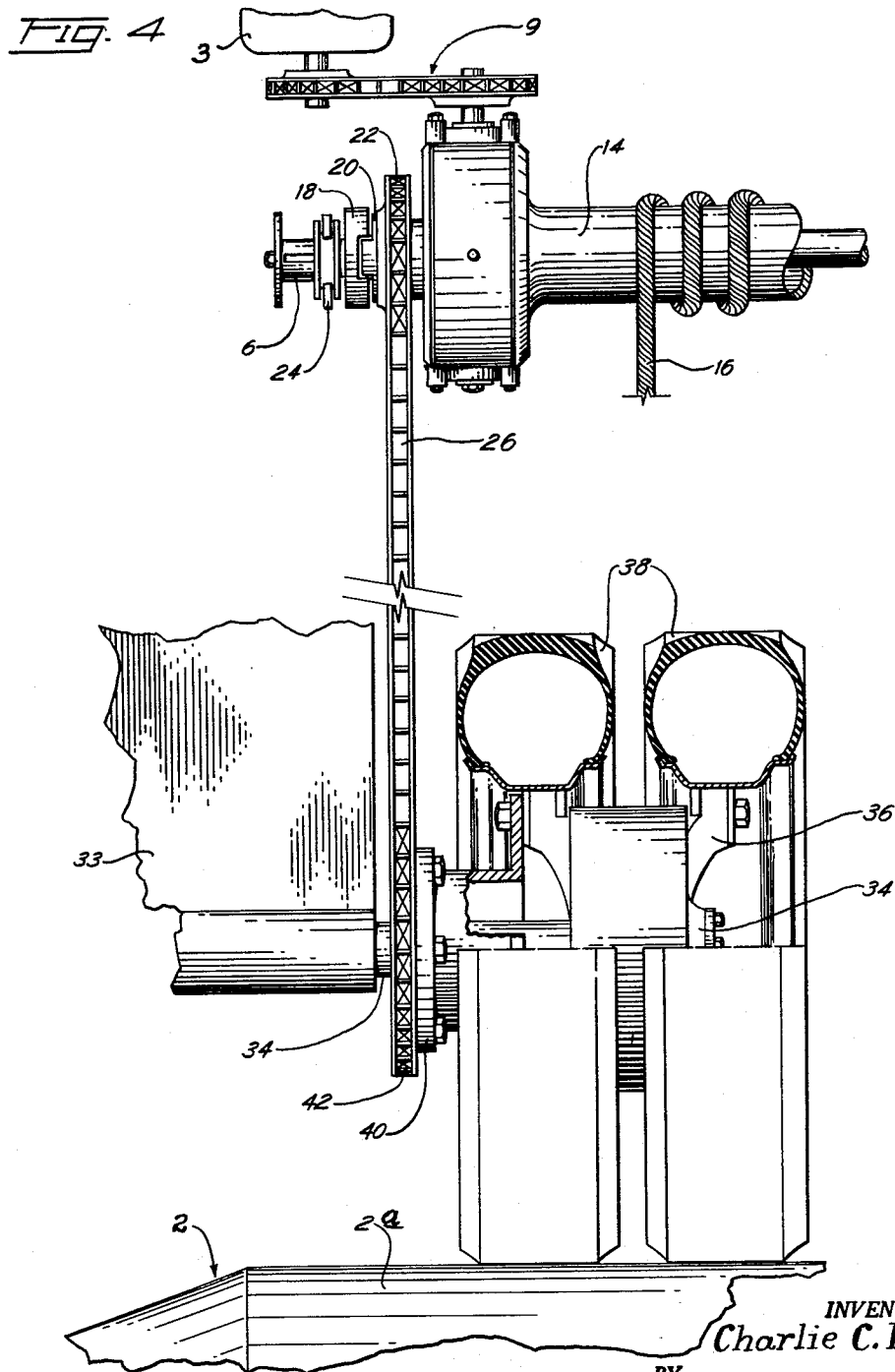
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1

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8 Claims. (Cl. 74-11)

This invention relates to drives for concrete mixers and more particularly to a mobile auxiliary drive unit which utilizes pneumatically tired wheels mounted on an independent mobile prime mover, such as a motor driven truck, which truck with the auxiliary drive thereon may be quickly moved from place to place and connected in friction driving relation with a drum of a concrete mixer which has been incapacitated, as by stripping of gears or by the power unit thereof becoming inoperative, or other malfunctions.

Heretofore when a truck mounted concrete mixer became incapacitated for a period of time with a load of plastic concrete therein, the concrete often became hardened and usually required air hammers to remove the concrete from within the drum of the concrete mixer, which operation was a very expensive procedure and kept the unit out of service for a considerable length of time, furthermore damage was often caused to the drum of the concrete mixer by the tools used to remove the hardened concrete therefrom.

The present device enables the mixing drum of a truck mounted concrete mixer to be rotated in either direction so as to enable the unloading of concrete while it is still in the plastic state. Many truck mounted concrete mixers have engines to drive the concrete mixer independently of the engine which drives the truck, so when the engine of the truck mounted concrete mixer becomes inoperative, or the transmission system between the engine and the concrete mixing drum becomes inoperative, the present mobile auxiliary drive unit, which has pneumatically tired wheels mounted thereon a spaced distance above the ground, may be positioned so that the pneumatically tired wheels thereof are in contact relation with the peripheral surface of the mixer drum and with the axis of the pneumatically tired wheels of the auxiliary drive unit being substantially parallel with the axis of rotation of the concrete mixer drum, the pneumatically tired wheels of the auxiliary drive unit may be brought into engagement with the mixer drum and held thereagainst by a winch line and the wheels of the auxiliary unit rotated by power, so as to rotate the drum of the concrete mixer at the desired speed and in either direction. In this manner the concrete may usually be unloaded at the desired location without the loss of the concrete or without the concrete becoming hardened within the mixer drum and the set concrete having to be removed therefrom by air hammers and the like.

An object of this invention is to provide an auxiliary drive unit for a concrete mixer drum which auxiliary drive unit is mounted on a mobile unit, such as a motorized truck, which may be moved from place to place to roll or rotate the cylindrical drums of concrete mixers mounted on trucks, trailers, or the like wherein the mechanism for rotating the drums has become inoperative, thereby enabling the concrete to be unloaded from the drum.

Another object of the invention is to provide an auxiliary drive unit for a concrete mixer drum on a companion unit, such as a truck, which is simple in construction, easy and effective to use, and which is low in the cost of manufacture.

Another object of the invention is to provide an auxiliary drive unit for a concrete mixer drum which auxiliary drive has power driven pneumatically tired wheels thereon the tires of which wheels are held in frictional engage-

2

ment with the drum of the concrete mixer by a cable connected to a winch mechanism.

With these objects in mind, and others which will become manifest as the description proceeds, reference is to be had to the accompanying drawings in which like reference characters designate like parts in the several views thereof, in which:

FIG. 1 is a perspective fragmentary view of a portion of a truck showing a concrete mixer mounted thereon, and showing a fragmentary portion of a truck having a mobile auxiliary drive thereon, with the mobile auxiliary drive unit being positioned in driving relation to the mixer drum of the truck mounted concrete mixer;

FIG. 2 is a perspective view of the mobile auxiliary drive unit for driving a concrete mixer, showing the opposite side of the auxiliary drive unit, which auxiliary drive unit is connected in driving relation with a mixer drum of the concrete mixer mounted on a truck;

FIG. 3 is an enlarged detailed, elevational view of the winch and drive mechanism shown apart from the truck, with portions broken away to show the details of construction, and showing diagrammatically a power take-off and an engine drive unit connected thereto;

FIG. 4 is an enlarged fragmentary plan view of a portion of the winch drive unit and the pneumatically tired wheels, with parts broken away and shortened and parts shown in section to bring out the details of construction of the device; and

FIG. 5 is an enlarged perspective view of the driven sprocket, shown apart from the auxiliary unit, which sprocket is adapted to be mounted on the pneumatic drive wheels of the auxiliary drive unit.

With more detailed reference to the drawings which shows the construction of the device, the numeral 1 designates generally a truck on which a concrete mixer 2 is mounted, which concrete mixer has a drum 3 rotatably mounted thereon. The drum of the concrete mixer is so constructed that, when turned in one direction, a mixing of the cement, sand, aggregate, and a liquid is accomplished, however, upon rotating the drum in the opposite direction, the plastic mixture of concrete is discharged from the rear end of the mixer into a chute to be directed to the place of use.

When any portion of the drive mechanism which drives the concrete mixer becomes incapacitated, while the mixer is loaded with plastic concrete, after a certain time interval, the concrete will set or harden within the drum of the concrete mixer and has to be removed by means such as air hammers or the like.

The mobile auxiliary drive unit, as particularly shown in FIGS. 1 and 2, is mounted on a truck designated generally by 4, which truck has a conventional power take-off mechanism 3 connected to the engine 5 of the truck 4. The power take-off mechanism 3 is connected in geared relation to drive the shaft 6 of a winch and gear mechanism generally designated by the numeral 8. The power take-off mechanism 3 drives the winch and gear mechanism 8 in either direction. A sprocket and chain drive is designated generally at 9 and connects the power take-off mechanism and the shaft 6 of the winch and gear mechanism in driving relation. A clutch 10 is mounted on a shaft 6 and is slidable thereon to complementally engage companion clutch member 12 to drive the winch drum 14. The winch and gear mechanism 8 is of a character that may be driven in either direction, as is well known in the art of truck winches.

A cable 16 is wound around winch drum 14, for general use and for a purpose which will be more fully brought out hereinafter. A movable clutch member 18 is slidably mounted on drive shaft 6 of the winch and gear mechanism on the end of the winch 14 opposite clutch 10 and is of the jaw type to complementally engage a

3

companion clutch member 20 on which a sprocket 22 is mounted, which companion clutch member is mounted on shaft 6. The sprocket 22 is journaled on shaft 6 for relative turning movement with respect thereto. The clutch member 18 is rotatable with shaft 6 but is slidable with respect thereto by a clutch yoke 24. The clutch member 18 is remotely operated from the cab of truck 4, in a manner well understood in the operation of clutches and the like.

Since the shaft 6 is rotatable through a power take-off mechanism 3 by the engine 5 of the truck 4, upon engagement of clutch member 18 with clutch member 20, a transmission drive chain 26 is rotated. A brake 28 is provided on one end of winch drum 14 and is operable by brake mechanism 30 in the conventional manner.

The truck 4 has a frame 32 thereon which mounts the winch and gear mechanism, designated generally by the numeral 8, on one end thereof and has an upwardly and outwardly extending shaft mounting portion 33 on which a shaft 34 is mounted with the axis thereof parallel to the axis of shaft 6. The shaft 34 is preferably secured to shaft mounting portion 33 as by welding or the like. Wheels 36 are journaled on shaft 34 and have pneumatic tires 38 thereon, which wheels are coaxial with shaft 34 for rotation about the axis of said shaft. A sprocket mounting member 40 is secured to the wheels 36 and is coaxial with shaft 34. The shaft 34 is positioned transversely of the truck 4 and extends outward and has a sprocket 42 mounted therearound, which sprocket 42 is seen in FIGS. 2, 4, and 5. The axis of shaft 34 is parallel to the axis of shaft 6 of winch and gear mechanism 8, so that the sprocket 42 is in aligned driving relation with sprocket 22 on the shaft 6 of winch and gear mechanism 8. The sprockets 22 and 42 have the endless drive chain 26 positioned therearound in driving relation, as will best be seen in FIGS. 2 and 4.

The axis of shaft 6 of winch and gear mechanism 8, the axis of shaft 34 on which wheels 36 are journaled, and the axis of the drum of mixer 2 are preferably parallel, however, the present device is so constructed that it will rotate the drum of a concrete mixer even if the axis thereof is not substantially parallel with the axis of shaft 34, as a slippage will occur with the tread surface of pneumatic tires 38 and the cylindrical portion of the drum of concrete mixer 2, however, a driving action to the drum will be accorded.

The concrete mixer truck 1 has a frame or structural member 44 thereon to which a hook 46 on the distal end of cable 16 connects, so as to enable the mobile auxiliary drive unit to be drawn into friction driving relation with the drum of concrete mixer 2 by winch and gear mechanism 8 by engaging clutch 10 with clutch 12 to rotate the winch drum 14.

The sprocket 22, the drive chain 26, and sprocket 42 are surrounded by a chain guard 48, as indicated in FIG. 1 partially in full outline and partially in dashed outline.

Operation

To operate the present device to "roll" or turn a drum of a truck mounted concrete mixer, the truck 4 is backed into position substantially at a right angle to truck 1 so that the tread faces of pneumatic tires 38, are in contact relation with the peripheral face of the drum of the truck mounted concrete mixer 2, so that the axis of shaft 34 will be approximately parallel with the rotational axis of the drum of the concrete mixer 2 which is to be turned. With trucks 1 and 4 so positioned, and with a cable connected in winding relation to the drum 14 of winch 8, and with a hook 46, positioned on the distal end of cable 16, connected to a frame or structural member of truck 1, a power take-off 3 on truck 4 is connected in driving relation with shaft 6 of winch and gear mechanism 8 and with jaw clutch 10 in complementary engagement with companion clutch member 12, the winch drum 14 is rotated in the desired direction to put a tension on cable 16 to tightly draw the tread face of pneumatic tires 38 into

4

binding engagement with the cylindrical portion of the drum of concrete mixer 2. When the winching function has been performed to engage the tread face of the pneumatic tires 38 with the cylindrical portion of the drum of the concrete mixer 2, the brake 28 is set to hold the winch drum 14 against rotation, whereupon the clutch 10 is disengaged from companion clutch member 12 and slidable clutch member 18 is engaged with companion clutch member 20, whereupon the power take-off 3 is shifted into gear to drive through sprocket and chain drive 9 to rotate shaft 6 in the desired direction, as is well known in conventional power take-off for truck winches. The shaft 6 will, in turn, drive sprocket 22 and endless chain 26 to rotate the sprocket 42 and wheels 36 on which pneumatic tires 38 are mounted. With the pneumatic tires 38 being driven by the engine 5 of the truck 4 and being in engagement with the cylindrical portion of the drum of the concrete mixer, the drum will be rotated in the desired direction. If it is desired to further mix the concrete, before it is discharged from the drum of the mixer, this may be accomplished by rotating the pneumatic tires in one direction, however, when it is desired to rotate the drum of the concrete mixer 2 in the opposite direction, this may be done by shifting the power take-off 3 into a gear to perform a reverse operation, whereupon the concrete will be discharged from the discharge end of the drum of the concrete mixer 2 and through the conventional chute to the desired place of use.

The mobile auxiliary drive unit, being thus frictionally engaged with the drum for rotation thereof will prevent the concrete from setting or hardening within the drum of mixer 2, which would necessitate the removal thereof by air hammers or other manual methods.

To disconnect the mobile auxiliary concrete mixer drum drive unit from the truck 1 on which the concrete mixer 2 is mounted, the brake 28 is released and the cable 16 is loosened to permit hook 46 to be disconnected from frame or structural member 44 on truck 1, whereupon the cable 16 may be wound onto drum 14 of winch 8 and the mobile auxiliary drive unit may be driven away until the use thereof is again required.

Having thus clearly shown and described this invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A mobile, auxiliary drive for rotating the cylindrical drum of a concrete mixer mounted on a companion unit or the like comprising: a wheeled vehicle adapted to move over the terrain, a power driven unit mounted on said wheeled vehicle and adapted to be selectively rotated, a transmission wheel mounted on said power driven unit, a transverse shaft mounted on said wheeled vehicle near the rear end thereof, a pneumatically tired wheel mounted on said shaft and rotatable about the axes thereof, a power transmission wheel mounted on said shaft adjacent said pneumatically tired wheel and being connected in driving relation with said pneumatically tired wheel, endless transmission drive means surrounding said transmission wheels to connect said pneumatically tired wheel in driving relation with said power driven unit mounted on said wheeled vehicle, and means connecting said wheeled vehicle and the companion unit mounting the cylindrical drum to draw and hold said pneumatically tired wheel in frictionally engaged relation with the cylindrical mixer drum on the concrete mixer to be rotated.

2. A mobile, auxiliary drive unit for rotating the cylindrical drum of a concrete mixer mounted on a companion unit or the like comprising: a wheeled, motor powered vehicle adapted to be driven over the terrain, a gear unit mounted on said vehicle, means selectively connecting the motor of said vehicle with said gear unit, a shaft mounted in and extending outwardly from said gear unit, a sprocket mounted on said shaft for rotation about the axis thereof, a second shaft, which second shaft is mounted on said vehicle a spaced distance from said outwardly extending shaft on said gear unit and being substantially parallel thereto, a pneumatically tired wheel mounted on said

5

second shaft and being rotatable about the axis thereof, a sprocket surrounding said second shaft and being connected in driving relation with said pneumatically tired wheel, an endless transmission chain surrounding said sprockets to connect said pneumatically tired wheel in driving relation with said gear unit on said vehicle, and means connected to said vehicle and the companion unit mounting the cylindrical drum to draw and hold said pneumatically tired wheel in frictional engagement with the surface of the concrete mixer drum to be rotated.

3. A truck mounted mobile, auxiliary drive unit for rotating the cylindrical drum of a concrete mixer or the like comprising: a motor powered truck, a power take-off mounted on said truck and connected in driving relation with the motor thereof, a winch and gear unit mounted on said truck, transmission drive means interconnecting said power take-off unit and said winch and gear unit in driving relation, a winch shaft on said winch and gear unit, clutches on said winch shaft, one of said clutches on said winch shaft adapted to selectively engage said winch shaft in driving relation with said power take-off, a cable mounted on and secured to said winch for winding relation therewith, an anchor means positioned on the distal end of said cable, a second shaft mounted on said truck, the axis of which shaft is a spaced distance above the axis of the wheels which move the truck over the terrain, a wheel mounted on said second shaft for rotation about the axis thereof, a material having friction surface thereon mounted on the periphery of said wheel, a sprocket mounted on said winch shaft which shaft extends outwardly from said winch and gear unit, a further clutch mounted on said outwardly extending winch shaft and adapted to selectively engage said sprocket in driving relation with said winch shaft, a further sprocket mounted said second shaft and being connected in driving relation with said wheel which has friction surface thereon and an endless transmission chain surrounding said sprockets to connect said winch shaft in driving relation with said wheel having a friction surface material thereon, said cable on said winch of the auxiliary drive unit being adapted to be connected to said concrete mixer to draw and hold said frictional surface on the periphery of said wheel on said auxiliary drive unit into binding engagement with the cylindrical drum on said concrete mixer to be rotated.

6

4. A truck mounted mobile, auxiliary drive unit for rotating the drum of a concrete mixer or the like as defined in claim 3, wherein the axes of said winch shaft and of said second shaft are substantially parallel and are mounted at an acute angle with respect to the horizon.

5. A truck mounted mobile, auxiliary drive unit for rotating the drum of a concrete mixer or the like as defined in claim 4, wherein said second shaft is mounted near the rear end of the body of the truck and has the wheel thereof rearwardly of the body of the truck.

6. A truck mounted mobile, auxiliary drive unit for rotating the drum of a concrete mixer or the like as defined in claim 4, wherein a plurality of wheels are mounted on said second shaft, each of said wheels having pneumatic tires thereon to form the material for the friction surface thereof.

7. A truck mounted mobile, auxiliary drive unit for rotating the drum of a concrete mixer or the like as defined in claim 3, wherein a base extends upwardly and outwardly from said truck at the rear end thereof, said second shaft being secured to the upper portion of said base, said wheel mounted on said shaft being journaled thereon and said further sprocket being secured to said wheel.

8. A mobile, auxiliary drive unit for rotating a cylindrical member on a companion unit, which auxiliary drive unit comprises; a prime mover adapted to be moved over the terrain, a shaft mounted on said prime mover transversely thereof, a wheel having a frictional surface thereon, mounted on said shaft to rotate about the axis thereof, transmission means connecting said prime mover and said shaft for selective rotation thereof, clutch means within said transmission drive means to selectively connect said wheel, having a frictional surface thereon, in driving relation with said prime mover, means connecting said prime mover and the cylindrical member on the companion unit together to draw and hold said wheel, having a frictional driving engagement with the cylindrical member on the companion unit.

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