Sept. 29, 1931. L. K. PARK 1,825,087

POWER UNIT

Filed Aug. 2, 1926 4 Sheets-Sheet 1

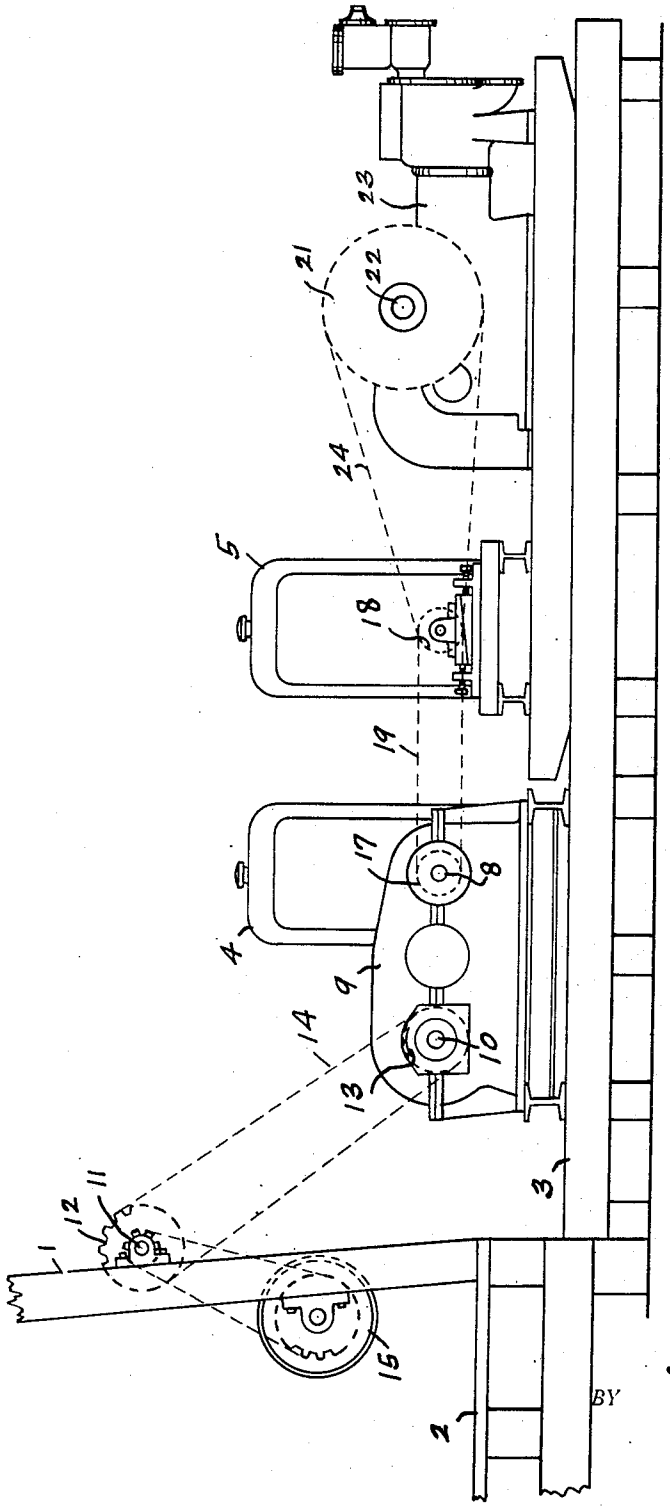


Fig. 1.

INVENTOR.
Leroy K Park
BY
Hardway & Cathey
ATTORNEYS

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POWER UNIT

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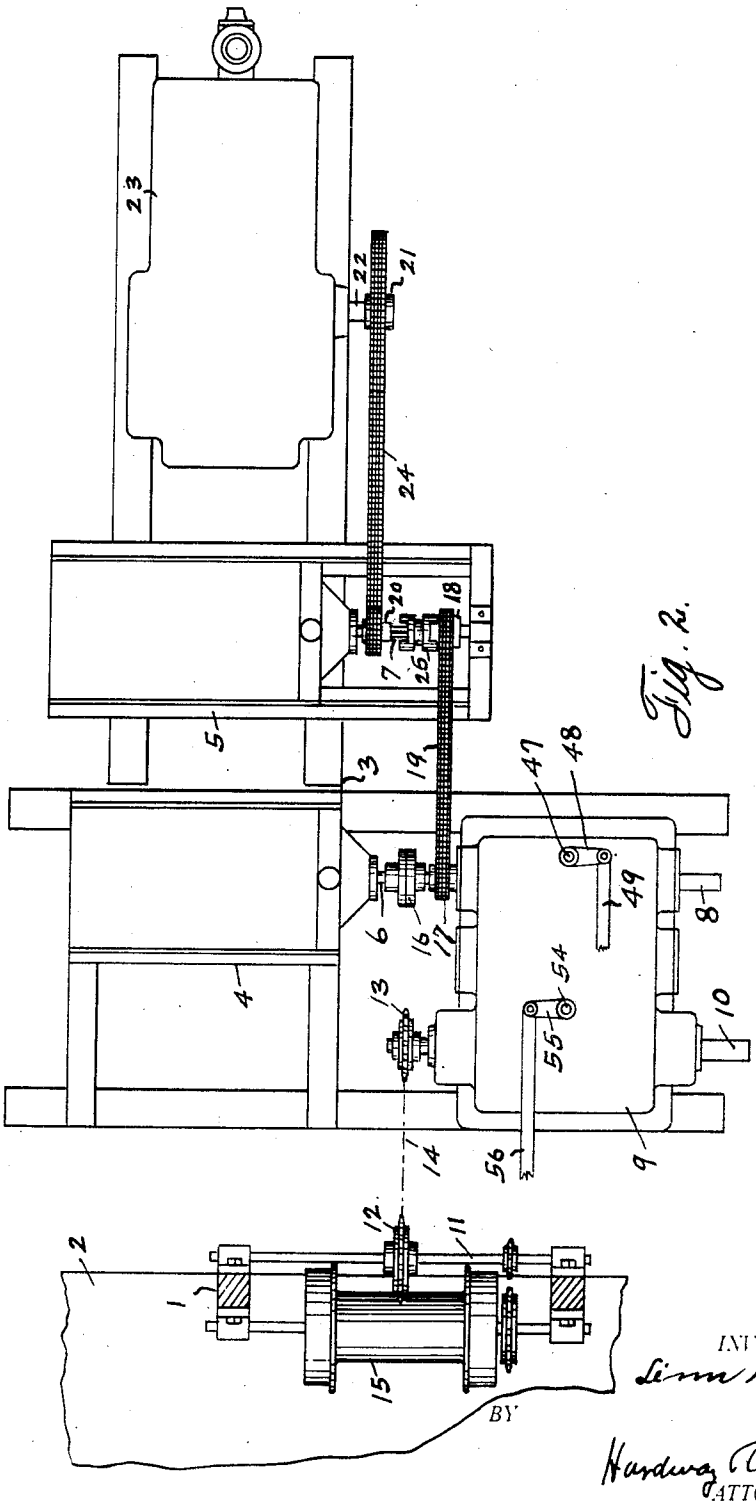


Fig. 2.

INVENTOR
Linn K. Park
BY
Hardway & Cathey
ATTORNEYS

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POWER UNIT

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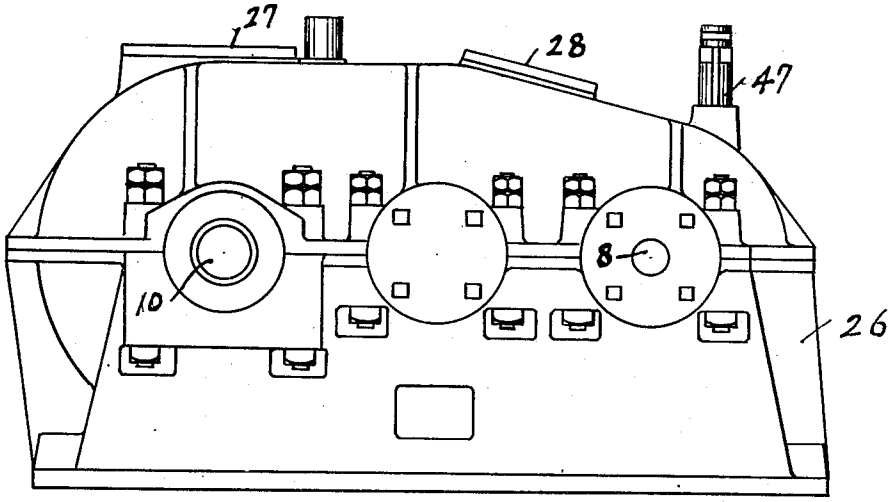


Fig. 3.

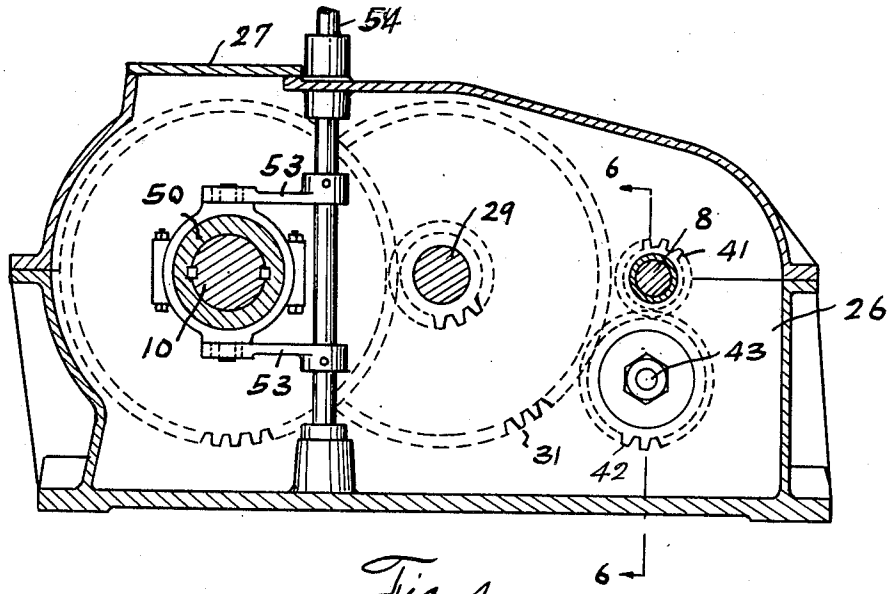


Fig. 4.

INVENTOR.
Linn K Park
BY
Hardway & Cathey.
ATTORNEY.

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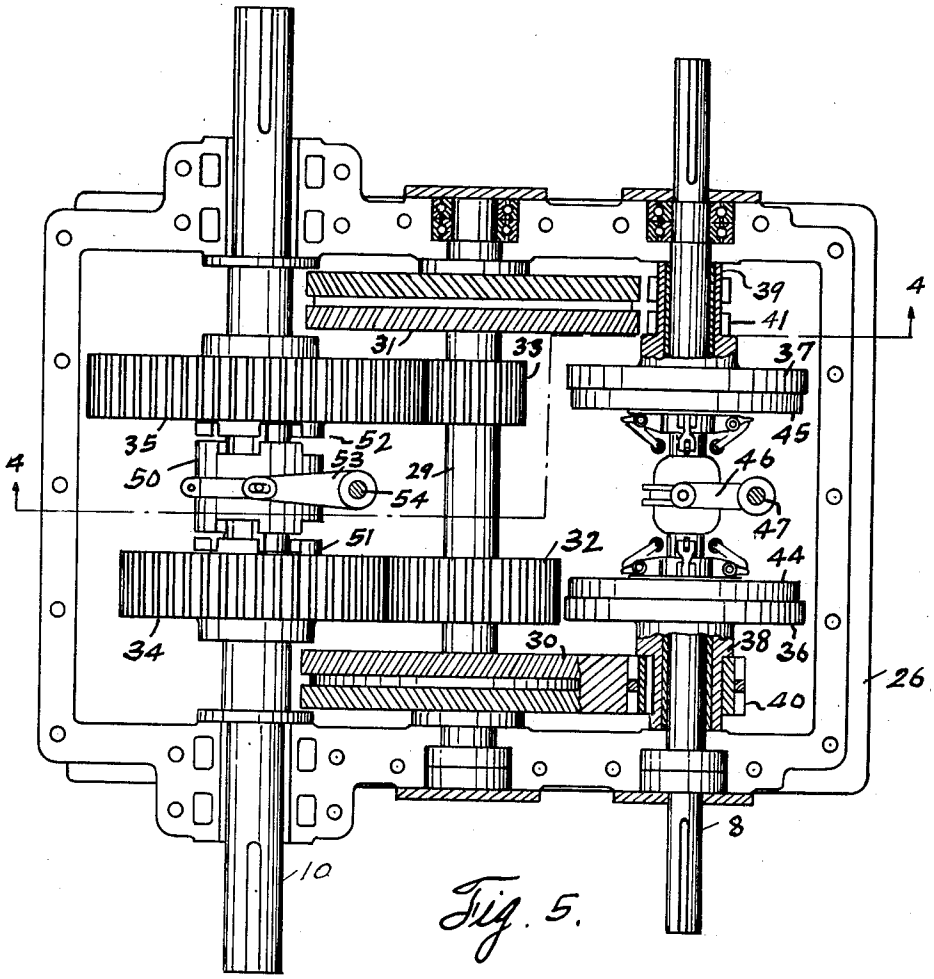


Fig. 5.

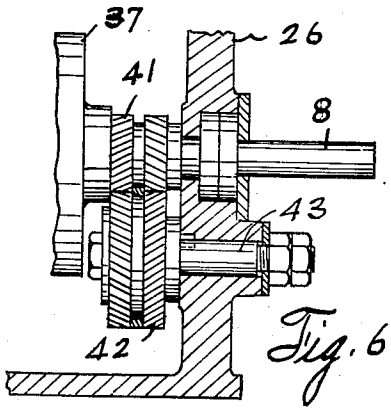


Fig. 6.

INVENTOR
Linn K. Park

BY

Hardway & Cathey
ATTORNEY.

Patented Sept. 29, 1931 1,825,087

UNITED STATES PATENT OFFICE

LINN K. PARK, OF HOUSTON, TEXAS

POWER UNIT

Application filed August 2, 1926. Serial No. 126,726.

This invention relates to new and useful improvements in a power unit.

One object of the invention is to provide an apparatus of the character described embodying a novel type of transmission whereby one or more internal combustion motors may be utilized to deliver power.

Another object of the invention is to provide an apparatus of the character described whereby a single internal combustion motor, or a plurality of such motors coupled together, may be utilized to deliver power in either direction without reversing the motor, or motors, and at variable speeds.

A further feature of the invention is to provide an apparatus of the character described specially adapted for use in carrying on well drilling and producing operations, and utilizing one or more internal combustion motors, as a source of power.

A still further feature of the invention resides in a novel type of transmission employed.

With the above and other objects in view this invention has particular relations to certain novel features of construction, operation and arrangement of parts, an example of which is given in this specification and illustrated in the accompanying drawings, wherein:—

Figure 1 shows a side elevation of the apparatus.

Figure 2 shows a plan view thereof.

Figure 3 shows a side elevation of the transmission case, enclosing the transmission employed.

Figure 4 shows a vertical sectional view thereof, taken on the line 4—4 of Figure 5.

Figure 5 shows a horizontal sectional view thereof, and

Figure 6 shows a fragmentary sectional view thereof, taken on the line 6—6 of Figure 4.

Referring now more particularly to the drawings, wherein like numerals of reference designate similar parts in each of the figures the numeral 1 designates a derrick, of conventional form, having the floor 2. Adjacent the derrick there is a suitable foundation 3, whereon the apparatus may be mounted.

The numerals 4 and 5 designate suitable internal combustion motors mounted on the foundation and having the power delivery shafts 6 and 7 which may be clutched with and released from said motor by means of the conventional clutches commonly incorporated into motors of this type.

The numeral 8 designates the driving shaft of the transmission, designated, as a whole by the numeral 9 and the numeral 10 designates the ultimate driven shaft of said transmission, which constitutes, also, the driving shaft for transmitting rotation to the draw works line shaft 11. This line shaft is rotatably mounted in the derrick 1 and has a sprocket wheel 12 fixed thereon and aligned with a corresponding sprocket wheel 13 which is fixed on the shaft 10. A sprocket chain 14 operates over said sprocket wheels and transmits rotation from the latter to the former. The line shaft 11 may be operatively connected with the draw works drum 15, in the usual manner, said drum being provided for handling the cable (not shown) through which loads are lifted, lowered and handled, in drilling operations, in the usual manner. The usual rotary drilling machine (not shown) may also be driven from said line shaft 11 in the usual way.

The shaft 6 is aligned with the shaft 8 and is connected therewith through a flexible coupling, as 16, and adjacent said coupling there is a sprocket wheel 17 fixed on the shaft 8 and aligned with a similar sprocket wheel 18, loosely mounted on the shaft 7. A sprocket chain 19 operates over the sprocket wheels 17 and 18.

Loosely mounted on the shaft 7 there is a sprocket wheel 20 which is aligned with a sprocket wheel 21 fixed on the drive shaft 22 of the pump 23. This pump is of conventional construction and is mounted on the foundation 3 and utilized for pumping water down into the well bore, while drilling, or for other purposes connected with drilling operations. A sprocket chain 24 operates over the sprocket wheels 20 and 21 and drives said pump.

Splined on the shaft 7 between the sprockets 18 and 20 there are two clutches 25 adapted to be engaged with said sprockets between which they are located. When one clutch is engaged with the sprocket 18 the motors 4 and 5 are thereby coupled together and both deliver power to the shaft 8, and if the other clutch 25 now be engaged with the sprocket 20 the pump will be driven from both motors 4 and 5. By suitably shifting the clutches, the power of either or both motors may be delivered in either direction.

The numeral 26 designates the gear box of the transmission, in which the shafts 8 and 10 are mounted. This box is formed of upper and lower sections whose abutting parts constitute outwardly turned flanges suitably bolted together and the top of the box has the removable cover plates 27 and 28 by the removal of which access may be gained into the interior of the box. The box is formed fluid tight so that a lubricant may be retained therein to lubricate the transmission gears and shaft bearings.

The shafts 8 and 10 are mounted to rotate in suitable bearings in said box and transversely disposed therein and spaced apart. Between them there is a transverse counter shaft 29 which is mounted to rotate in suitable end bearings, within said box, and fixed upon this shaft, inside of its bearing, are the direct and reverse transmission gears 30, 31 of the herringbone type. Also fixed on the shaft 29 are the high and low speed spur gears 32 and 33 which are in mesh with corresponding gears 34 and 35 loosely mounted on the driven shaft 10.

Loosely mounted on the shaft 8 are the disc clutch members 36 and 37 for direct and reverse drive, respectively, having the extended hubs 38 and 39 on which the driving gears 40 and 41 respectively are fixed, the former of which is in mesh with the direct drive gear 30 and the latter of which is in mesh with an intermediate gear 42, which is mounted on the stub shaft 43, anchored to the gear box 26, and is in mesh with the reverse gear 31. Disc clutches 44 and 45 are splined on the shaft 8 between the clutch members 36 and 37 and are operable through the clutch operating arm 46 which is fixed to the lower end of the shaft 47. The upper end of this shaft has the arm 48 fixed thereto to the free end of which one end of the clutch shifting rod 49 is pivotally connected. Through the manipulation of this rod the clutches 44, 45, may be simultaneously shifted to alternatively clutch either clutch member 36, or 37, with the shaft 8 and to simultaneously release the other clutch member from said shaft, so that said shaft 8 may be driven in either direction, at the will of the operator.

Splined on the shaft 10, between the gear 34 and 35, is the jaw clutch 50 which is shiftable into engagement with either of the clutch members 51 or 52 into which the adjacent ends of the hubs of the gears 34, 35, are formed. The clutch 50 may be shifted through the arms 53, 53, which are fixed to the lower end of the clutch shifting shaft 54 and whose free ends are pivoted to said clutch 50. The upper end of the shaft 54 has an arm 55 fixed thereto whose free end is pivotally connected to one end of the clutch shifting rod 56 and through this rod the clutch 50 may be shifted by the operator to vary the speed of the shaft 10. In lifting light loads about the derrick, or in driving the rotary drilling machine a high speed is desirable but in lifting heavy loads, as in withdrawing the drill stem from, or letting it down into, the bore a low speed is preferable.

In ordinary drilling operations only one motor, as 4 is connected with the draw works, while the other motor, as 5, is connected to and drives the pump 23 to supply fluid for flushing out the bore. In case more power be required for driving the draw works, or for other work being accomplished, the clutch 25 may be shifted into engagement with the sprocket wheel 18 and both motors 4 and 5 coupled together for the work required.

The outer ends of the shafts 8 and 10 are extended beyond the gear box and thus adapted to be connected to any other work desired, as for example well pumping or other similar work. Through the apparatus described internal combustion motors may be employed in well drilling or pumping operations, to take the place of steam engines now commonly employed and through the transmission, embodied in said apparatus, the required flexibility is obtained for applying the power delivered from an internal combustion motor to the work to be accomplished.

What I claim is:—

1. An apparatus of the character described including a pair of motors each having a driving shaft, a pair of sprocket wheels loosely mounted on one of said shafts, means for alternately clutching said sprocket wheels with said shaft, a sprocket chain in driving relation with each sprocket wheel, a sprocket wheel fixed on the shaft of the other motor over which one of said sprocket chains operate, a driven mechanism operatively connected with said last mentioned shaft and a driven mechanism including a sprocket wheel over which the other sprocket chain operates.

2. An apparatus of the character described including a pair of motors, each having a driving shaft, a pair of driving elements loosely mounted on one of said shafts, means for alternately clutching said

driving elements with said shaft, a power transmitting element in driving relation with each of said driving elements, a driving element fixed on the shaft of the other motor with which one of said power transmitting elements is operatively connected, a driven mechanism operatively connected with said last mentioned shaft and a driven mechanism including a driving element with which the other power transmitting element is operatively connected.

3. Apparatus for driving well drilling mechanism including motors, each having a driving shaft, a pair of driving elements operatively connected with one of said shafts, means for alternatively clutching said driving elements with their corresponding shaft, a power transmitting element in driving relation with each of said driving elements, a driving element connected to the shaft of another motor with which one of said transmitting elements may be connected, a driven mechanism operatively connected with the driving element of said other motor and connected to, and adapted to drive the draw works of said well drilling mechanism.

4. An apparatus of the character described including a pair of motors, each having a driving shaft, a pair of driving elements operatively connected with one of said shafts, means for alternately clutching said driving elements with said shaft, a power transmitting element in driving relation with each of said driving elements, a driving element connected to the shaft of the other motor with which one of said power transmitting elements may be operatively connected, a driven mechanism operatively connected with said last mentioned shaft and another driven mechanism including a driving element with which one of said power transmitting elements is operatively connected.

5. Apparatus for driving a well drilling mechanism including a motor, a pair of driving elements operatively connected therewith, a driving means for the draw works, one of said elements of said pair being operatively connected to said driving means, a slush pump, the other of said driving elements of said pair being operatively connected with said slush pump, and means for connecting either or both of the driving elements to the motor.

In testimony whereof I have signed my name to this specification.

LINN K. PARK.

CERTIFICATE OF CORRECTION.

Patent No. 1,825,087. Granted September 29, 1931, to

LINN K. PARK.

It is hereby certified that error appears in the above numbered patent requiring correction as follows: In the drawings, Figure 2, should appear as shown below instead of as shown in the drawings;

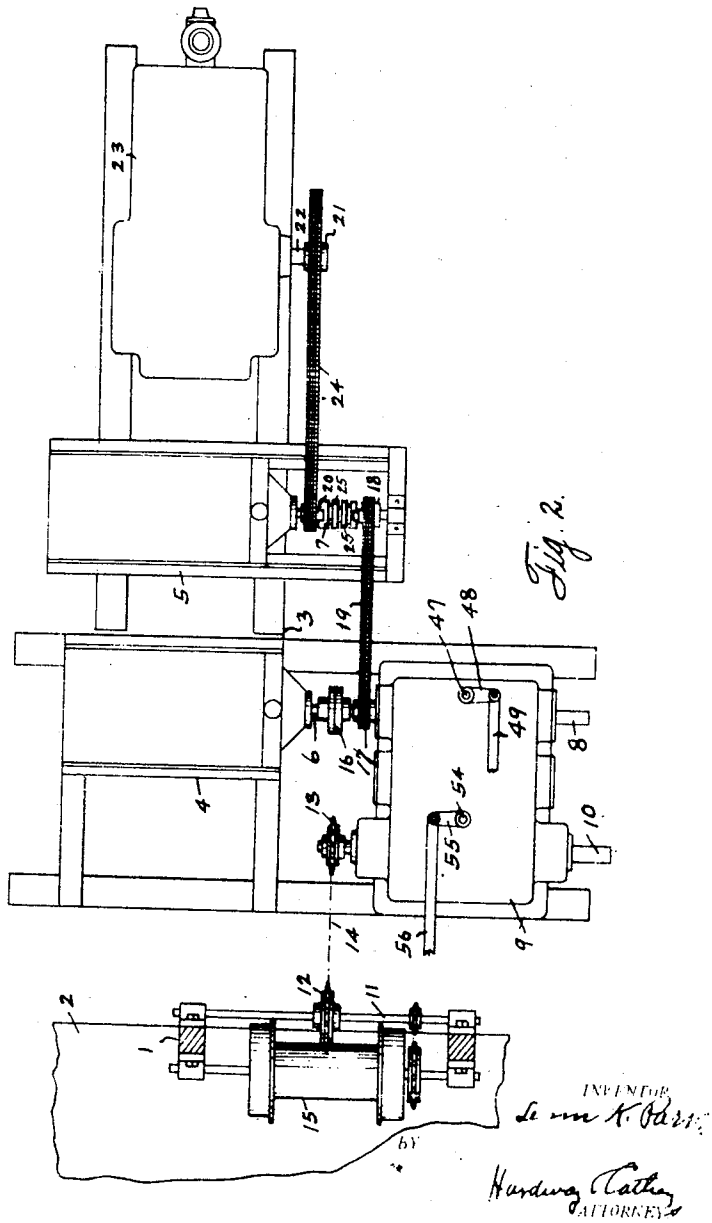


Fig. 2.

and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 15th day of December, A. D. 1931.

(Seal)

M. J. Moore,

Acting Commissioner of Patents.