

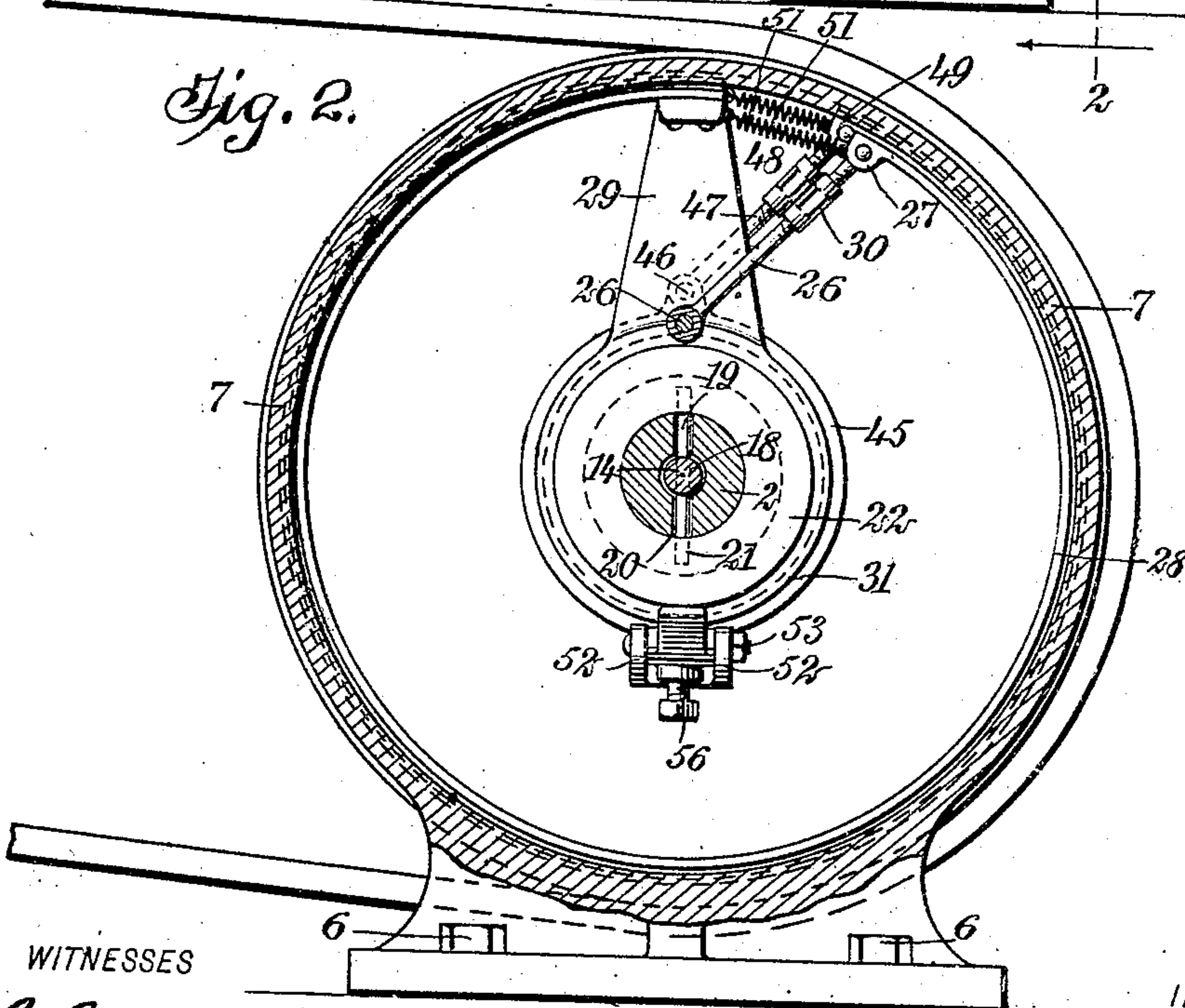
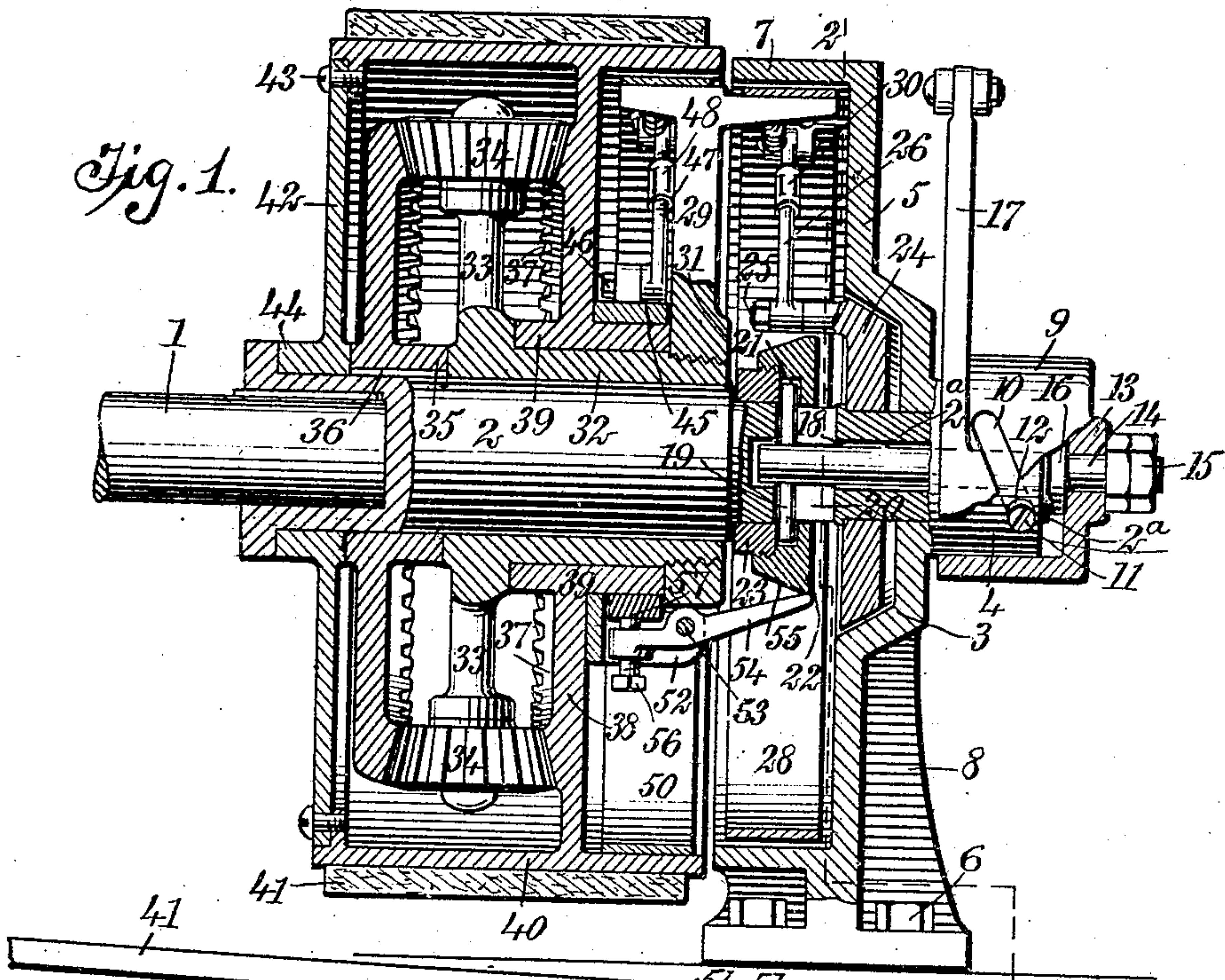
No. 870,444.

PATENTED NOV. 5, 1907.

J. W. LEONARD & H. E. BROWN.

GEARING.

APPLICATION FILED JUNE 29, 1907.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN WALTER LEONARD AND HARRY EDGAR BROWN, OF WASHINGTON, PENNSYLVANIA.

GEARING.

No. 870,444.

Specification of Letters Patent.

Patented Nov. 5, 1907.

Application filed June 29, 1907. Serial No. 381,481.

To all whom it may concern:

Be it known that we, JOHN WALTER LEONARD and HARRY EDGAR BROWN, both citizens of the United States, and residents of Washington, in the county of Washington and State of Pennsylvania, have invented a new and Improved Gearing, of which the following is a full, clear, and exact description.

This invention is designed to provide a gearing, strong in construction, effective in operation and durable in use, especially adapted to be employed in connection with convertible gas and steam engines for operating oil wells.

The special objects of the invention will be fully understood from the following description and accompanying drawings, in which drawings like characters of reference indicate like parts throughout the views, and in which

Figure 1 is a vertical transverse section, partly in side elevation, of a device embodying our invention; and Fig. 2 is a transverse section taken on the line 2—2 of Fig. 1.

As illustrated in the drawings, 1 represents the drive shaft of an engine keyed or otherwise secured to a stub section 2 having a reduced outer end 2^a which is journaled in the off-set portion 3 and hub 4 of a head 5. This head is adapted to be firmly secured to a base or sill by means of bolts 6, and is preferably provided with a laterally extending annular rim 7 and a vertical strengthening rib 8. A sleeve 9 is mounted upon the hub 4 of said head and provided with a cam slot 10 which engages a stud 11 attached to the hub 4, and preferably provided with an anti-friction roller 12 adapted to bear against the edges of the sleeve 9 forming the slot 10. The sleeve 9 is also provided with an outer head 13 having an aperture adapted to receive a pin 14 provided with a threaded outer end engaging lock nuts 15. A collar 16 is fixedly secured to the pin 14 and bears against the inner wall of the head 13 of said sleeve. An operating lever 17 is attached to said sleeve, by means of which the head 9 may be partially rotated on the hub 4 and moved bodily longitudinally of said hub. The pin 14 engages a longitudinal aperture 18 formed in the reduced end 2^a of the driving shaft, and the inner end of said pin is provided with a pin 19 extending transversely of the pin 14 and engaging a transverse slot 20 formed in the end of the driving shaft. The transverse pin 19 engages apertures 21 formed in an annular head 22 having an inner ring 23 connected therewith, preferably by means of a threaded engagement, for the purpose of enabling the transverse pin 19 to be arranged and held within the apertures 21 of the head 22.

An annular head 24 is rotatably mounted upon the reduced end 2^a of the driving shaft, and provided with a laterally extending stud 25 to which is pivotally attached the inner end of a connecting rod 26, the outer

end of which rod is pivotally attached to the free end 27 of a band 28, the opposite end of said band being fixedly secured to an arm 29. The connecting rod 26 is preferably provided with a turn-buckle 30 by means of which the free end of the band 28 may be adjusted relatively to the stud 25 of the head 24. The arm 29 extends laterally from a hub 31 having a threaded connection with a sleeve 32 freely journaled upon the stub shaft 2. Stems 33 extend outward from the inner end of the sleeve 32 and support beveled gears 34 mounted to rotate on the outer ends of said stems. The teeth of said gears mesh with a laterally toothed gear 35 which is fixedly secured to the driving shaft by means of a key 36, or otherwise, and said gears also mesh with a laterally toothed ring or gear 37 formed on an annular web 38 of a driving wheel having an inner sleeve 39 mounted to rotate freely on the sleeve 32, and an outer rim 40 adapted to operate a driving belt 41. The driving wheel is also preferably provided with an inner head 42, detachably secured by means of studs 43 to the driving wheel, and provided with a central hub 44 adapted to rotate freely on the driving shaft.

A collar 45 is mounted to turn freely upon the flange 39 of the driving wheel, and is provided with a stud 46 to which is pivotally attached the inner end of a connecting rod 47 provided with a turn-buckle 48, the outer end of said rod being connected with the free end 49 of an inner band 50 adapted to bear against the inner periphery of the driving wheel. Springs 51 are connected with the free ends of the gripping bands 28 and 50, and also with the arm 29, to withdraw the free ends of said bands from contact with the driving wheel and stationary stud respectively, when they are not held against said wheel or head by the connecting rods 26 or 47. The ring 45 is provided with ears 52 having a pin 53 upon which is mounted a lever 54, the outer end of which bears against the inclined periphery 55 of the head 22. The inner end of said lever is provided with an adjusting screw 56, the inner end of which bears against a wearing block 57 which bears against the sleeve 39 of the driving wheel.

When the device is in use and the operating lever 17 is in the position indicated in Fig. 1, the stud 11 is at the lower and outer portion of the slot 10 formed in the sleeve 9, and the pin 14 is projected to its greatest extent within the longitudinal aperture 18 of the end of the sleeve, bringing the collar 16 of said pin in contact with the outer end 2^a of the shaft. When the inner end of the pin 14 is so projected to its full extent into the hollow end of the shaft 2, the head 22 is carried inward by means of the transverse pin 19 so that the inclined periphery 55 of said head bears against the outer or free end of the lever 54. The inner end of said lever bears against the wearing block 57 and binds the ring

45 upon which said lever is mounted, to the sleeve 39 of the driving pulley, and the connecting rod 47 pivotally attached to said ring forces the free end of the gripping band 50 against the inner periphery of the outer portion of the driving wheel thereby locking together said driving wheel, the gripping band 50, arm 29 and sleeve 32, upon which said arm is mounted. When the sleeve 32 is locked to the driving wheel the beveled gears 34 are inoperative, for the reason that the sleeve 32 moves with the gear 36, and all of the said parts rotate with the drive shaft 1. At such time the outer gripping band 28 is free from contact with the rim 7 of the head 5, and rotates with the arm 29 and the head 24, which also rotate with the arm 29, sleeve 32 and the driving pulley, in a forward direction. To reverse the movement of the driving wheel, so as to rotate backward while the shaft is rotating forward, the operating lever 17 is depressed so that the stud 11 operating in the cam slot 10 will cause the sleeve 9 to move bodily outward on the hub 4 of the stationary head 5. Such movement of the sleeve 9 carries the pin 14 outward, thereby causing the head 22 to move outward on the reduced end 2^a of the driving shaft, bringing the outer face of said head against the inner face of the head 24, and binding said head against the inner wall of the off-set portion of the stationary head 5. The inner head forms an auxiliary clutch with the main stationary head, and holds the head 24 against rotation on the driving shaft 1. The outer movement of the head 22 releases the outward pressure on the free end of the lever 54 and consequently releases the pressure exerted by the other end of said lever on the ring 45, and frees the inner gripping band 50 from contact with the inner periphery of the driving wheel, thereby leaving said driving wheel free to rotate independently of said ring, and arm 29. When the head 24 is clutched to the stationary head 5, the connecting rod 26 attached to the stud 25 of said head forces the outer gripping band 28 against the ring 7 of the main head, and holds the stems 33 and the sleeve 32 with which said stems are connected, against rotary movement on the driving shaft. As the sleeve 32 and stems 33 connected therewith are held against rotary movement, the drive shaft in rotating and the laterally toothed gear fixedly attached thereto, rotate the beveled gears 34 in one direction, which in turn rotate the driving wheel in an opposite direction by means of the laterally toothed gear 37 formed on the web 38 of said wheel, thereby causing the driving wheel to rotate in an opposite direction to that in which the driving gear 36 and driving shaft are rotated. To rotate the driving wheel in the same direction as the shaft, the operating lever 17 is raised so as to bring the parts in the position indicated in Fig. 1 in the manner hereinbefore described.

Engines used in connection with oil wells are commonly constructed so as to be driven either by gas or steam by removing the steam cylinder and using a gas cylinder in its place, or the reverse. The driving shaft of gas engines is generally made short, and not of sufficient length to be used with a clutch pulley. To avoid removing the shaft and inserting a longer shaft when the engine is changed from a gas to a steam engine, we provide the clutch pulley with a stub shaft 2 of its own, having a recessed end, or otherwise adapted to be secured to the main section of the drive shaft. One of

the special features of the construction herein shown consists in placing the auxiliary clutches upon the hub of the wheel instead of on the shaft, by means of which the thrust of the auxiliary clutch is taken off the shaft and placed upon the wheel itself. By means of such construction, moreover, driving pulleys of any dimensions may be readily and quickly reversed by the operator and caused to rotate in the same direction as the shaft or in a direction opposite thereto, while the arrangement of the gripping bands near the outside of the pulley and away from the engine enables the friction grips to be readily adjusted. Engines are commonly employed in connection with oil wells in which both steam and gas cylinders are used.

In the construction shown and described herein, we have embodied our invention in its preferred form. We do not desire to be limited to such construction, however, as other means having similar capabilities may be used without departing from our invention.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. The combination with a stationary head, of a drive shaft, a gear fixedly secured to said shaft, a driving wheel mounted to rotate freely on said shaft and provided with a laterally toothed ring, a sleeve mounted on said shaft and provided with an operating arm, gears carried by said sleeve engaging the gears of said shaft and wheel, gripping bands connected together by means of said operating arm and adapted to bear against said wheel and head respectively, and means for binding one of said bands to its adjacent locking member independently of the other band.
2. The combination with a stationary head, of a driving shaft, a gear fixedly secured to said shaft, a sleeve mounted to rotate freely on said shaft and provided with an operating arm, gears carried by said sleeve engaging the gear of said shaft, a driving wheel mounted to rotate freely on said sleeve and provided with a laterally toothed ring engaging the gears of said sleeve, gripping bands connected with said arm and adapted to bear against said wheel and head respectively, and mechanism for binding one of said bands against its adjacent locking member independently of the other bands.
3. The combination with a stationary head, of a drive shaft, a gear fixedly secured to said shaft, a sleeve mounted to rotate on said shaft and provided with an operating arm, gears carried by said sleeve meshing with the gear of said shaft, a wheel adapted to rotate on said sleeve and provided with a laterally toothed gear engaging the gears of said sleeve, gripping bands attached to said operating arm and adapted to bear against said wheel and head respectively, a ring mounted on the hub of said wheel, and means connected with said ring adapted to operate the gripping band of said wheel independently of the gripping band of said head.
4. The combination with a stationary head, of a drive shaft, a gear fixedly secured to said shaft, a sleeve adapted to rotate freely on said shaft and provided with an operating arm, gears carried by said sleeve engaging the gear of said shaft, a driving wheel mounted to rotate freely on said sleeve and provided with a gear engaging the gears of said sleeve, gripping bands connected with said operating arm, auxiliary clutches connected with said gripping bands, and means for operating one of said auxiliary clutches independently of the other.
5. The combination with a stationary head, of a drive shaft, a gear fixedly secured to said shaft, a sleeve mounted to rotate on said shaft provided with an operating arm, gears carried by said sleeve engaging the gear of said shaft, a wheel adapted to rotate on said sleeve and provided with a laterally toothed gear engaging the gears of said sleeve, gripping bands connected with said operating arm, an auxiliary clutch mounted on the hub of said wheel, an auxiliary clutch mounted on said head, connecting mechanism between said clutches and bands respectively, and means for operating said clutches so as to bring one

of the gripping bands in contact with its respective locking member.

6. The combination with a stationary head, of a drive shaft, a gear fixedly secured to said shaft, a sleeve mounted to rotate on said shaft provided with an operating arm, gears carried by said sleeve engaging the gear of said shaft, a wheel provided with a hub adapted to rotate on said sleeve, gripping bands secured to said operating arm and adapted to bear against said head and wheel respectively, an auxiliary clutch head mounted on the outer end of said shaft having a sliding engagement therewith, and adapted to rotate freely thereon, means connecting said head with one of said gripping bands, and mechanism adapted to hold said last named head in frictional contact with said stationary head.

7. The combination with a stationary head, of a driving shaft, a gear fixedly attached thereto, a sleeve adapted to rotate freely on said shaft and provided with an operating arm, gears carried by said sleeve engaging the gear of said shaft, a driving wheel adapted to rotate on said sleeve and provided with a gear engaging the gears of the sleeve, a ring freely mounted on the hub of said wheel, a gripping band connected with said wheel and operating arm, a head rotatably mounted on said shaft and having a sliding movement longitudinally thereof, a gripping band connected with said head and operating arm, an operating head adapted to move longitudinally of said shaft and hold said sliding head in engagement with the stationary head, and means connected with said operating head adapted to control the operation of the gripping band of said wheel.

8. The combination with a stationary head, of a drive shaft having a hollow end, a gear fixedly secured to said shaft, a sleeve mounted to rotate on said shaft and provided with an operating arm, gearing carried by said sleeve engaging the gear of the drive shaft, gripping bands connected with said arm and with said wheel and stationary head respectively, an auxiliary clutch head mounted to rotate on the outer end of said shaft and move longitudinally thereof, an operating head having a sliding movement longitudinally of said shaft adapted to hold the auxiliary clutch head in engagement with the stationary head, a pin movable in the hollow end of said shaft, a sleeve provided with a cam slot, and an operating lever adapted to move said pin and operating head longitudinally of said sleeve.

9. The combination with a stationary head, of a drive shaft, a gear fixedly secured to said shaft, a sleeve mounted to rotate on said shaft provided with an operating arm, gears carried by said sleeve engaging the gear of the drive shaft, a wheel freely journaled on said sleeve and provided with a gear engaging the gears of said sleeve, gripping bands secured at one end to said arm and adapted to bear against said wheel and stationary head respectively, an auxiliary clutch ring mounted on the hub of said wheel and connected with the gripping band of said wheel, an auxiliary clutch head mounted on said shaft and connected to the gripping band of the stationary head, and mechanism for binding said auxiliary head in engagement with the stationary head and for clamping said ring to the hub of the driving wheel.

10. The combination with a stationary head, of a drive shaft journaled in said head, a gear fixedly attached to said shaft, a sleeve mounted to rotate freely on said shaft and provided with an operating arm, gears carried by said sleeve engaging the shaft gear, a drive wheel mounted to rotate freely on said sleeve, a ring freely mounted on the hub of said wheel, a gripping band connected with said operating arm and ring, and means for clamping said ring and wheel together.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN WALTER LEONARD.
HARRY EDGAR BROWN.

Witnesses:

JOHN H. DONNAN,
MINNIE A. LEONARD.