R. L. LAMBERTON.

INTERMITTENT GRIP DEVICE.

APPLICATION FILED MAY 21, 1910.

1,028,574.

Patented June 4, 1912.

2 SHEETS—SHEET 1.

Fig. 1

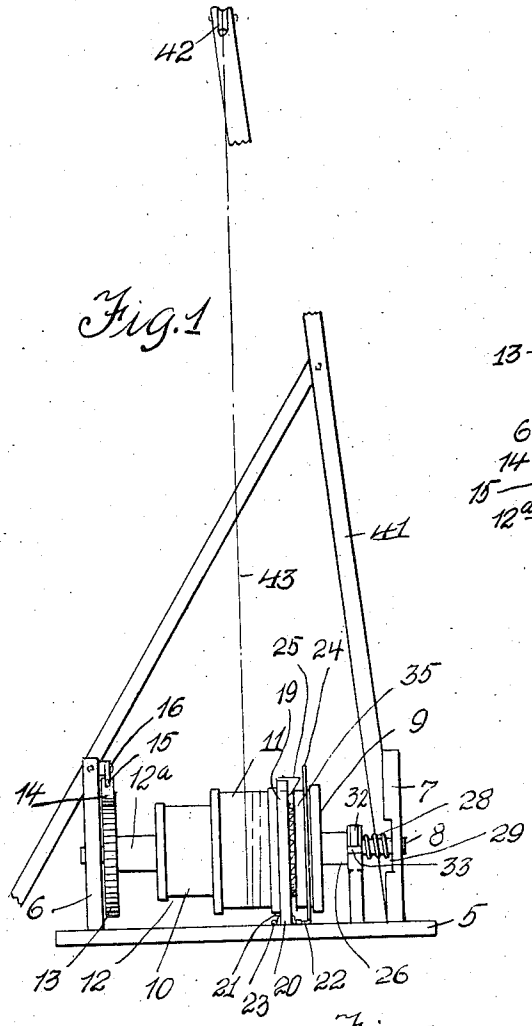


Fig. 2.

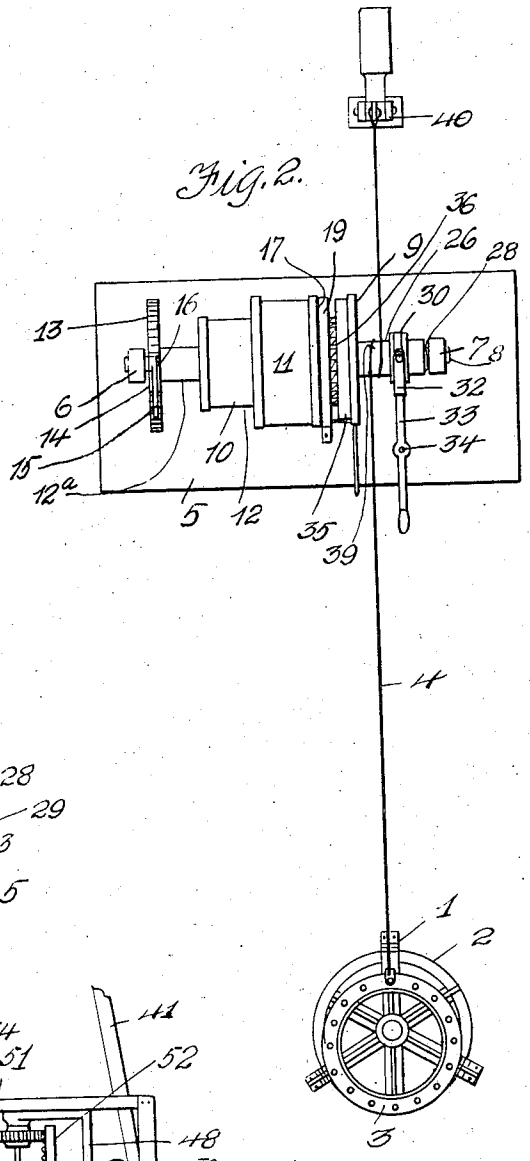
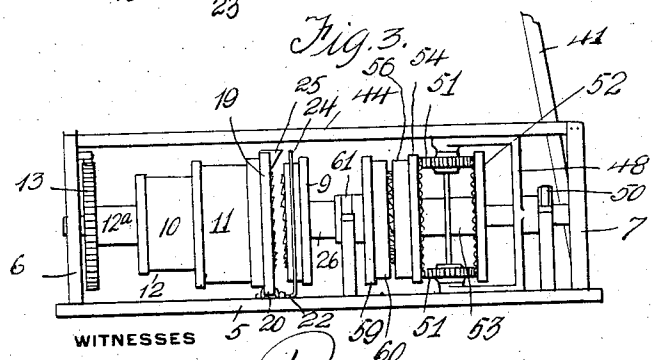


Fig. 3.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 4.

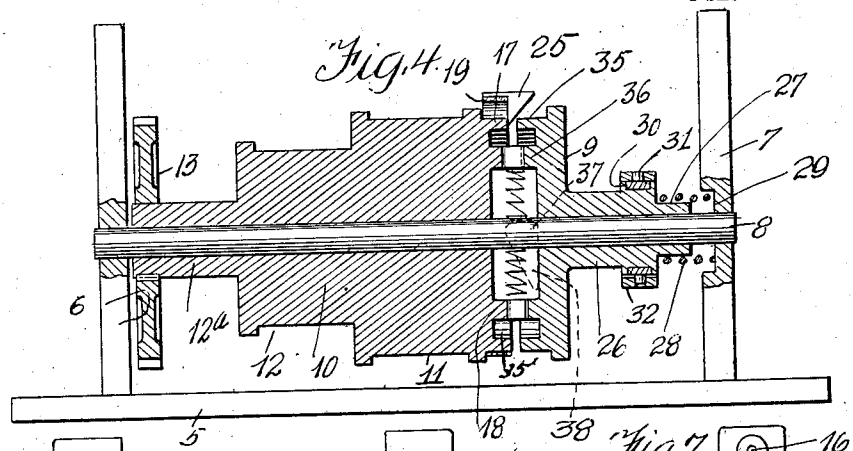


Fig. 5.

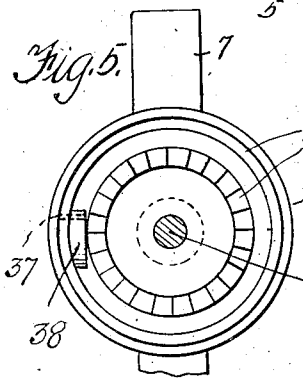


Fig. 6.

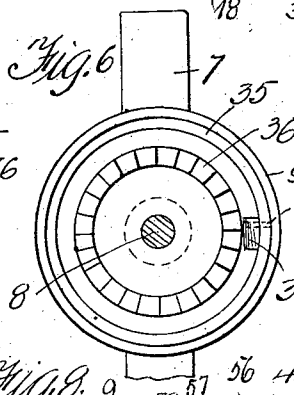


Fig. 7.

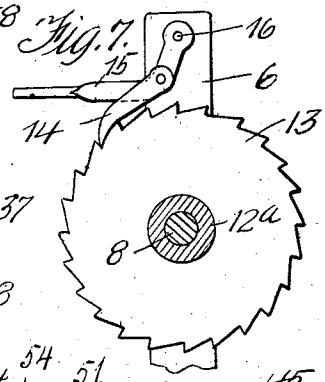


Fig. 8.

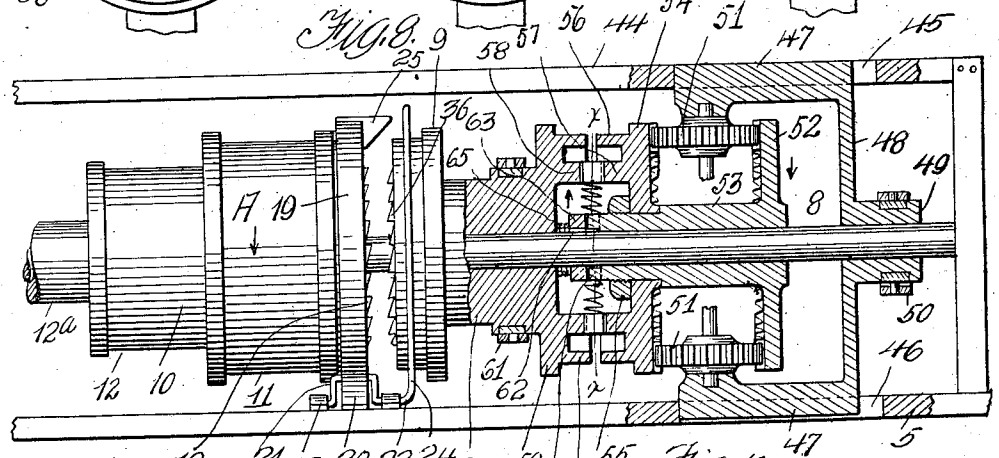


Fig. 9.

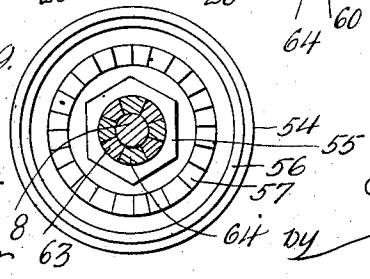
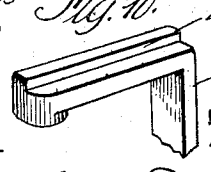


Fig. 10.



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UNITED STATES PATENT OFFICE.

ROBERT LESLIE LAMBERTON, OF SISTERSVILLE, WEST VIRGINIA.

INTERMITTENT-GRIP DEVICE.

1,028,574. Specification of Letters Patent. Patented June 4, 1912.

Application filed May 21, 1910. Serial No. 562,753.

To all whom it may concern:

Be it known that I, ROBERT LESLIE LAMBERTON, a citizen of the United States of America, residing at Sistersville, in the county of Tyler and State of West Virginia, have invented certain new and useful Improvements in Intermittent-Grip Devices, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to an intermittent grip device particularly designed for use in the oil fields, especially where pumping powers are employed in connection with a group of wells for operating pumps within the wells from a central source of power.

My invention aims to provide a novel mechanism than can be advantageously employed for removing pumping outfits, tubing and other matter from wells, the hoisting device being portable and easily installed. To this end, I have devised novel clutch mechanisms that will permit of two speeds being operated in connection with the hoisting device, furthermore, I have devised positive and reliable means for transmitting the reciprocatory movement of a power to the clutch mechanisms.

My invention will be hereinafter more fully described and then claimed, and reference will now be had to the drawings forming a part of this specification, wherein:—

Figure 1 is a front elevation of a hoisting device embodying a single clutch, Fig. 2 is a plan of the same, showing the hoisting device in connection with a pump, Fig. 3 is a front elevation of a hoisting device embodying a double clutch mechanism, Fig. 4 is an enlarged longitudinal sectional view of the single clutch mechanism, Fig. 5 is a front elevation of one of the clutch members, Fig. 6 is a similar view of the clutch member, showing the gravity member in another position, Fig. 7 is a similar view of a ratchet wheel forming part of the clutch mechanism, Fig. 8 is an enlarged front elevation of a device embodying a double clutch mechanism, one of the mechanisms being partly broken away and partly in section, Fig. 9 is a cross sectional view taken on the line X—X of Fig. 8, and Fig. 10 is a perspective view of a portion of a shiftable bearing forming part of the double clutch.

In the accompanying drawing the reference numeral 1 denotes a conventional form of pumping power embodying a driven wheel 2 and a horizontal eccentric 3 to which a plurality of cables can be attached, and in order that the operation of the hoisting device in connection with this power can be understood, I have shown one of the cables designated 4.

Located adjacent to an oil well and in the vicinity of the power 1 is a base plate or foundation 5 supporting standards 6 and 7. Journaled in said standards is a longitudinal shaft 8 and loosely mounted upon said shaft is a clutch member 9 and fixed upon said shaft is a clutch member 10. The member 10 is stepped to provide hoisting drums 11, 12 and 12^a, and upon the end of the drum 12^a adjacent to the standard 6 is mounted a large ratchet wheel 13. Engaging this ratchet wheel is a gravity pawl 14 carried by a lever 15 pivotally connected to the standard 6, as at 16. The drums 11, 12 and 12^a are adapted to receive hoisting cables and either drum can be used according to the speed the cable is to be wound. The ratchet wheel 13 and the pawl 14 prevent the drums from revolving in a direction that would cause the hoisting cables to become unwound.

The clutch member 10 has the large end thereof provided with an annular rim 17 and within said rim are circumferentially arranged ratchet teeth 18, these teeth facing the clutch member 9. The rim 17 serves functionally as a brake wheel and surrounding said rim is a brake band 19 having one end thereof anchored upon the base plate 5, as at 20 while the opposite end thereof is connected to the crank 21 of a shaft 22 located in bearings 23, carried by the base plate 5, said shaft having an operating rod or lever 24. By manipulating this lever the brake band 19 can be moved into engagement with the periphery of the rim 17 to control the operation of the clutch member 10. Mounted upon the top of the brake band 19 is a wedge member 25, the purpose of which will presently appear.

The clutch member 9 is provided with a hub 26 having a reduced end 27 and encircling said reduced end is a coiled compression spring 28 interposed between the end of the hub 26 and the standard 7, said standard being provided with a socket 29 to receive the outer convolution of the spring 28. The hub 26 of the clutch member 9 is provided with an annular groove 30 and extending into said groove are diametrically opposed

pins 31 carried by a yoke 32 having an operating lever 33 fulcrumed, as at 34 upon the base plate 5. The clutch member 9 has the face thereof confronting the clutch member 10 provided with an annular rim 35 and within said rim are circumferentially arranged ratchet teeth 36 adapted to engage the teeth 18 of the clutch member 10.

Pivotally connected to the inner side of the rim 35, as at 37 is a triangular shaped gravity member 38, the purpose of which will presently appear.

The cable 4 is adapted to pass around the hub 26 of the clutch member 9, said cable being connected to the hub, as at 39 and having the end thereof resiliently anchored, as at 40, adjacent to the base plate 5.

A suitable derrick or rigging 41 is erected contiguous to the base plate 5 and over the revoluble sheave 42 at the upper end of the derrick, the cable 43 of the hoisting device is adapted to pass, when raising or lowering matter from an oil well, the cable 43 being attached or wound upon one of the drums 11, 12 or 12^a of the clutch member 10.

Before describing the device embodying a double clutch, the operation of the single clutch device will be considered. Assuming that the power 1 is in operation, the cable 4 being alternately pulled by said power and the resilient member 40, the clutch member 9 will rotate first in one direction and then in another and this rocking movement of the clutch member 9 is adapted to intermittently impart a rotary movement to the clutch member 10. The coiled compression spring 28 normally holds the teeth 36 of the member 9 in engagement with the teeth 18 of the member 10 and when these teeth mesh the members 9 and 10 move in unison. As the clutch member 9 revolves from the position shown in Fig. 4 of the drawings, the gravity member 38 is carried for one-half of a revolution in the position shown by dotted lines in Fig. 4, and for the other half of the revolution the triangular shaped gravity member 38 is swung outwardly to a horizontal position. It will be noted that the member 38 is of sufficient weight to move the clutch member 9 outwardly by overcoming the compression spring 28 whenever the gravity member 38 is permitted to swing freely downwardly. It is this member 38, bearing within the annular groove 35′ of the clutch member 10, that forces the teeth 36 of the clutch member 9 out of engagement with the teeth 18 of the clutch member 10 during a rearward rotation or rocking movement of the clutch member 9, thereby preventing the clutch member 9 from rearwardly rotating the clutch member 10, the teeth of the two clutch members being arranged so as to engage with each other only upon the above named forward rotation of the clutch member 9 and to permit the teeth of said member 9 to ratchet back even if the teeth are in slight contact upon the said named rearward rotation. The triangular shaped gravity member 38 thus automatically moves the clutch member 9 out of engagement with the member 10, while the coiled spring 28 restores the clutch member 9 to its normal position in engagement with the member 10, when the gravity member 38 swings downwardly by its own weight to normal inoperative position. It is the shoulder or base of this member that retains the members with the altitude thereof at right angles to the member 9 when swung downwardly. The operating lever 33 permits of the clutch member 9 being manually shifted out of engagement with the member 10 when the cable 43 is being unwound, and this unwinding movement of the clutch member 10 can be controlled by the brake band 19. Even with the member 9 in operation, the brake band 19 can be adjusted to hold the member 10 and when the brake band 19 is carried into engagement with the rim 17, the wedge member 25 immediately forces the member 9 out of engagement with the member 10 and retains it out of engagement as long as the member 10 is frictionally held by the brake band 19.

Reference will now be had to Figs. 3, 8, 9 and 10 showing the double clutch device. With this type of device the upper ends of the standards 6 and 7 are connected by a longitudinal beam 44, said beam having a longitudinal slot 45 formed therein in vertical alinement with a similar slot 46 formed in the base plate 5. Slidably mounted in the slots 45 and 46 are the upper and lower ends 47 of a bearing 48, said bearing having a central hub 49 providing clearance for the shaft 8. The hub 48 loosely surrounds the shaft 8 and is shifted longitudinally thereon through the medium of a yoke 50 constructed and arranged similar to the yoke 32. The upper and lower ends 47 of the bearing 48 support revoluble horizontal gear wheels 51 meshing with a large vertical gear wheel 52 carried by the end of a sleeve 53 loosely mounted upon the shaft 8. Revolubly mounted upon the opposite end of the sleeve 53 is a vertical gear wheel 54 retained thereon by a jam nut or collar 55 screwed upon the end of the sleeve 53. The gear wheel 54 is provided with an annular rim 56 and circumferentially arranged teeth 57, the latter being adapted to mesh with similarly arranged teeth 58 carried by a wheel 59 formed integral with the hub 26 of the clutch member 9, these teeth being the reverse of the ratchet teeth 18 and 36. The wheel 59 is provided with a rim 60 and the hub 26 is shifted upon the shaft 8 through the medium of a yoke 61 constructed and arranged similar to the yokes 32 and 50.

Keyed or otherwise secured to the shaft 8, as at 62 is a collar 63 having one side thereof toothed to engage teeth 64 carried by the end of the sleeve 53. A coiled spring 65 encircles the shaft 8 between the collar 63 and the end of the hub 26, said spring serving the same function as the coiled spring 28.

The double clutch device operates in the following manner:—Assuming that the hub 26 is rocked or oscillated upon the shaft 8 by the cable 4, it will move the clutch member 10 in the direction of the arrow A when in engagement therewith, and when the clutch member 9 engages the member 10, the teeth 58 of the wheel 59 are out of engagement with the teeth 57 of the wheel 54, and as the clutch member 10 is mounted upon the shaft 8, the shaft 8 will be revolved with the clutch member 10 and through the medium of the collar 63 the sleeve 53 will be revolved and the wheels 51 and 54 will revolve without affecting the movement of the clutch member 9. As heretofore stated the clutch member 9 carries the clutch member 10 one-half of a revolution and then recedes from the member 10. As the member 9 recedes from the member 10, the teeth 58 of the wheel 59 immediately engage the teeth 57 of the wheel 54, consequently the opposite movement of the hub 26 from that previously described causes the wheel 59 to revolve in an opposite direction from that indicated by the arrow A and through the medium of the wheels 54, 51 and 52, the sleeve 53 which is in engagement with the collar 63 causes the shaft 8 to revolve in the same direction as the arrow A, and as the clutch member 10 is mounted upon the shaft 8, there will be a continuous rotary movement of the clutch member 10 even though the clutch member 9 is out of engagement with said member. In other words, the clutch member 9 revolves the clutch member 10 one-half of a revolution and the gearing including the elements 59, 54, 51 and 53 revolve the clutch member 10 the remaining one-half revolution, thus insuring a continuous rotation of the clutch member 10 so long as the teeth 57 of the wheel 54 meshes with the teeth 58 of the wheel 59. It is apparent that when the bearing 48 is shifted through the medium of the yoke 50 that the clutch members 9 and 10 can be used as a single clutch hoisting mechanism, and it is only when it is desired to rapidly wind the cable 43 upon one of the drums of the member 10 that the double clutch mechanism is used.

From the foregoing it will be observed that I have devised a novel clutch mechanism for intermittently moving drums and in conjunction with the clutch mechanism have employed an additional clutch mechanism or gearing that can coöperate with the first mentioned clutch mechanism for continuously operating said drums, the combination of these elements producing a hoisting device that is not only positive in its operation, but free from injury by ordinary use.

Having now described my invention what I claim as new, is:—

1. A device of the class described comprising a revoluble clutch member, an oscillatory clutch member normally held in engagement therewith, a gravity member carried by said oscillatory member and adapted to automatically separate said members, a brake mechanism in connection with said revoluble member, said means including a brake band surrounding said clutch member, and a wedge member carried by said brake band and adapted to move said oscillatory member out of engagement with said revoluble member.

2. A device of the type described, comprising a revoluble clutch member, an oscillatory clutch member normally held in engagement therewith, and means carried by said oscillatory clutch member for intermittently moving said oscillatory clutch member out of engagement with said revoluble clutch member, said means including a pivoted triangular shaped gravity member carried by said oscillatory member and adapted to engage said revoluble clutch member.

In testimony whereof I affix my signature in the presence of two witnesses.

ROBERT LESLIE LAMBERTON.

Witnesses:

P. P. MILLIKIN,

ALICE MILLIKIN.