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CORE DRILL.

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1,006,418.

Patented Oct. 17, 1911.

Fig. 1

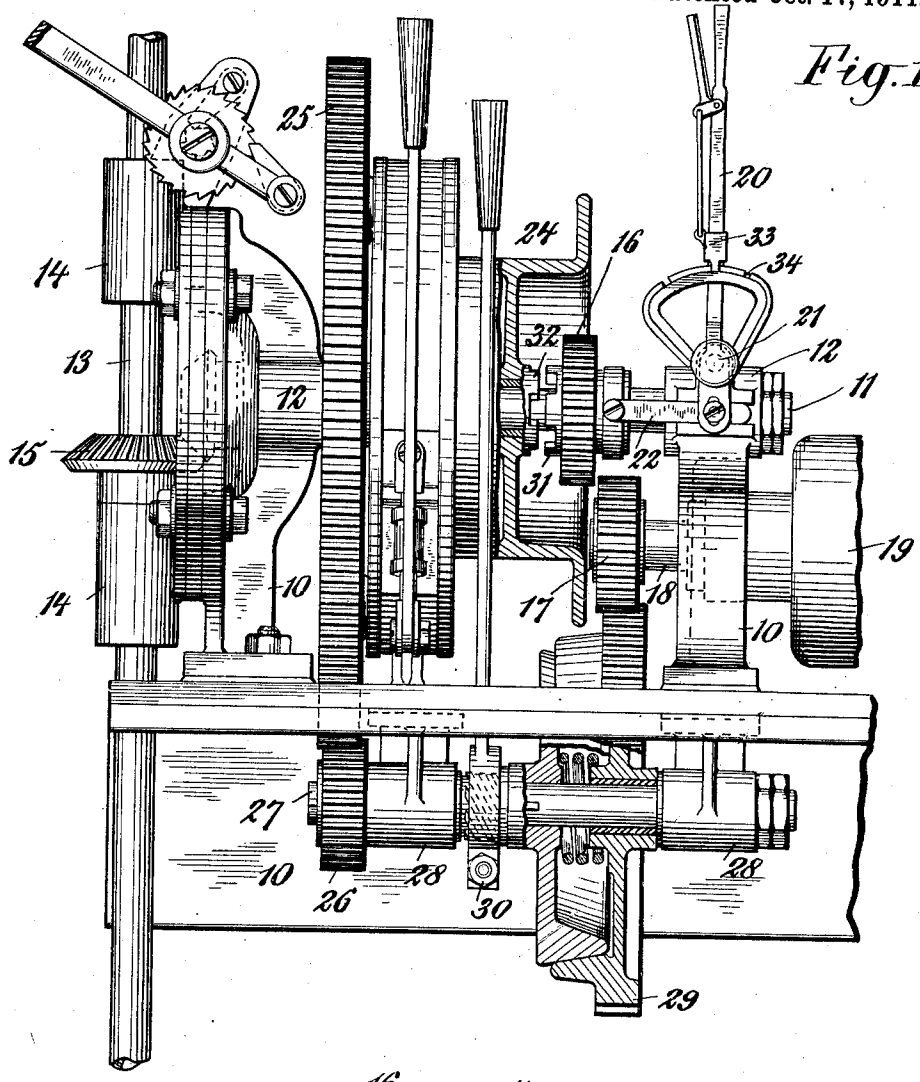
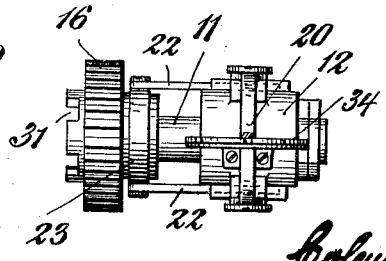


Fig. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

COLEMAN ARTHUR TERRY, DECEASED, LATE OF NEW YORK, N. Y.; EMMA J. TERRY, ADMINISTRATRIX, ASSIGNOR TO TERRY CORE DRILL COMPANY, A CORPORATION OF NEW YORK.

CORE-DRILL.

1,006,418. Specification of Letters Patent. Patented Oct. 17, 1911.

Application filed October 23, 1909. Serial No. 524,205.

To all whom it may concern:

Be it known that COLEMAN ARTHUR TERRY, deceased, formerly a citizen of the United States, and a resident of the city of New York, borough of Manhattan, county and State of New York, did prior to his decease invent certain new and useful Improvements in Core-Drills, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The invention relates to core drills for deep earth boring, and particularly to an improved means for operatively connecting the drill with its driving means at different rates of speed.

Various kinds of drilling bits are commonly employed in drills of this description, and the drill is required to be run at widely different speeds in accordance with the class of bit employed,—where a chipping cutter is employed the drill is rotated about five to eight times a minute, while when a shot bit is employed the same drill would be rotated about two hundred times a minute; and it is the object of the present invention to provide a simple and inexpensive means whereby the changes in speed of drive may be readily and quickly effected.

The following is a detail description of a drill embodying the invention, reference being had to the accompanying drawings illustrating the same, the novel features being thereafter pointed out in claims.

In the drawings: Figure 1 is a view in side elevation of the drill, portions thereof being broken away in central longitudinal section. Fig. 2 is a detail top view of certain portions of the gearing and the operating means therefor.

The drill comprises, in general, a framework 10, a horizontal shaft 11 suitably journaled in bearings 12 in the said frame, a vertical drill spindle 13 suitably journaled in bearings 14 in the said frame, and bevel gearing 15 connecting the said drill spindle 13 and the said horizontal shaft 11 in driving relation.

Splined to the horizontal shaft 11 so that it is compelled to rotate therewith but is permitted a movement longitudinally along the same, is a pinion 16, and the pitch line of the said pinion is arranged tangentially in line with the pitch line of a pinion 17 mounted fast upon the main drive shaft 18 of a motor 19. In the position shown in the drawings, the pinion 16 is out of mesh with the pinion 17, but it may be moved into mesh therewith by means of an operating lever 20 pivoted at 21 to the framework of the drill, the said lever being connected by means of a link 22 with the pinion 16, through the medium of a collar 23 rotatably mounted upon the hub of the said pinion. A movement of the operating lever 20 to the left (as viewed in Fig. 1), will throw the pinion 16 over to the right and a direct driving connection will then be established between the drive shaft 18 and the horizontal shaft 11.

The drill is provided, as is common, with a hoisting drum 24, and means are provided for driving the said drum at a low rate of speed. The drum is mounted to rotate loosely upon the shaft 11, and is provided with a spur gear 25 secured fast thereto; the teeth of the spur gear 25 are arranged in mesh with the teeth of a pinion 26 which is mounted fast upon an intermediate shaft 27. The intermediate shaft is journaled in suitable bearings 28 in the frame, being disposed in parallel relation with the shafts 11 and 18. A spur gear 29 is mounted loosely upon the said shaft and the teeth thereof are disposed in mesh with the teeth of the pinion 17 upon the drive shaft 18. A clutch 30 is provided for operatively connecting the loosely mounted spur gear 29 with the intermediate shaft 18, at will. When the clutch is operated to so connect the spur gear 29 the hoisting drum 24 is driven at a slow rate of speed from the drive shaft 18, through the pinion 17, spur gear 29, pinion 26, and spur gear 25; the rate of speed will, it will be seen, be largely reduced because of the compound gearing employed. By so arranging that the relative rate of speed between the direct drive above described and the low speed drive for the hoist, is proportioned to the proportionate speed of drive required for the two different styles of drilling above mentioned, it is possible, then, by disconnecting the direct drive and connecting the horizontal shaft with the hoist drum drive just described, to drive the drill at the low speed, and that with practically no added mechanism. To effect such connection I have provided the pinion 16 with one member 31 of a jaw clutch, the other member 32 of which is provided upon the hub of

the drum 24. By throwing the lever 20 to the right the jaw clutch members may be connected so as to connect the pinion 16 in driving relation with the drum 24, and hence because the pinion 16 is splined upon the shaft 11, to connect the said shaft in driving relation therewith. The lever 20 is provided with a locking dog 33 arranged for engagement with notches in a quadrant 34 by which the lever may be maintained in its adjusted position.

The various adjustments then are as follows: With the lever 20 in its central position the pinion 16 is out of mesh and hence no driving movements will be imparted to the drill, but by manipulation of the clutch 30 rotative movement at a low speed may be imparted to the hoisting drum 24. By throwing the lever 20 over to the left the pinion 16 will be thrown into mesh with the pinion 17 and direct high-speed movement will be imparted to the drill, while at the same time low-speed movement may be imparted to the hoist drum 24, through the manipulation of the clutch 30, or, by releasing the gearing through the reverse operation of the clutch 30, the drum may be allowed to remain idle. Again, by throwing the lever 20 over to the right and by operating the clutch 30, low speed driving movement may be imparted simultaneously to the hoisting drum 24 and to the drill spindle.

From the foregoing it will be seen that the change from one speed of drive to another may be effected by the manipulation of the lever 20, whereby a minimum of time and effort will be expended by the operator in making such change, yet, it will also be seen that the changes and additions to the mechanism for the purpose of accomplishing the result are very slight and inexpensive.

It may be noted that in the particular arrangement of gearing shown the effect of changing from high speed to low speed driving of the drill rod reverses the direction of drive, so that where it is desired to continue the rotation of the drill rod in the same direction it will be necessary to reverse the direction of drive of the motor 19. If this be not desirable such changes in the gear train as will readily suggest themselves to those skilled in this art may be made as will produce the same relative direction of rotation for either speed.

The following is claimed:

1. In a core drill, the combination with a vertical drill shaft, a horizontal shaft, and gearing between them, of a drive shaft, a sliding gear splined upon the horizontal shaft, another gear loosely mounted upon the said shaft, constantly meshed low speed gearing for connecting the drive shaft with the gear loosely mounted upon the horizontal shaft, and means for sliding the first said gear upon the horizontal shaft into, and out of, high-speed driving engagement with the drive shaft, and for alternatively connecting the second said gear in driving relation with the said horizontal shaft.

2. In a core drill, the combination with a vertical drill shaft, a horizontal shaft, and gearing between them, of a pinion slidingly mounted upon the said horizontal shaft but connected to rotate therewith, a spur gear loosely mounted upon the horizontal shaft, a drive shaft mounted parallel to, but out of line with, the said horizontal shaft, a pinion thereon, an intermediate shaft, compound low speed gearing between the pinion upon the drive shaft and the loose spur gear upon the horizontal shaft, means connecting the said pinion upon the intermediate shaft with the spur gear to connect them rotatively together when the pinion is in one position, and means for sliding the pinion to another position to cause the same to be released from the spur gear and to cause the same to intermesh with the pinion of the drive shaft, the said operating means being adapted to also hold the said pinion in an intermediate position wherein it is free from engagement with both the drive shaft pinion and the spur gear.

3. In a core drill, the combination with a vertical drill shaft, a horizontal shaft, and gearing between them, of a sliding pinion mounted upon the horizontal shaft to rotate therewith, a spur gear loosely mounted upon the said horizontal shaft, jaw clutch elements connected to rotate with the said pinion and spur gear respectively, a drive shaft mounted parallel to, but out of line with, the said horizontal shaft, a pinion thereon, an intermediate shaft, compound low speed gearing between the said pinion and the said spur gear, an operating clutch therefor, and means for moving the sliding pinion to alternatively cause the intermeshing of the two said pinions and the coengagement of the two said jaw clutch members.

4. In a core drill, the combination with a vertical drill shaft, a horizontal shaft, and gearing between them, of a spur gear and winding drum secured to rotate together loosely upon the said horizontal shaft, a sliding pinion mounted upon the horizontal shaft to rotate therewith, means for connecting the sliding pinion with the said spur gear and winding drum, a drive shaft mounted parallel to, but out of line with, the said horizontal shaft, a pinion thereon, an operating element for moving the first said pinion into, and out of, engagement with the last said pinion, low speed gearing for connecting the drive shaft pinion with the said spur gear, and a clutch for controlling the operation of the said low speed gearing.

5. In a core drill, the combination with a vertical drill shaft, a horizontal shaft, gearing between them, and a hoisting drum

loosely mounted upon the horizontal shaft, of a drive shaft, a low speed train of gearing between the drive shaft and the hoisting drum, a clutch in said low speed gearing train, a sliding element upon the horizontal shaft, and manual operating means for moving the sliding element in one direction into operative connection with the hoisting drum, in the opposite direction into operative connection with the drive shaft, or into a neutral position out of either of such operative connections.

Witness my hand this 30 day of Sept., 1909.

EMMA J. TERRY,
Administratrix of the estate of Coleman Arthur Terry, deceased.

Witnesses:
C. M. WAMBAUGH,
H. C. PARK.