No. 877,528. PATENTED JAN. 28, 1908.

C. A. TERRY.

CORE DRILLING APPARATUS.

APPLICATION FILED MAY 29, 1907.

2 SHEETS—SHEET 1.

Fig. 2.

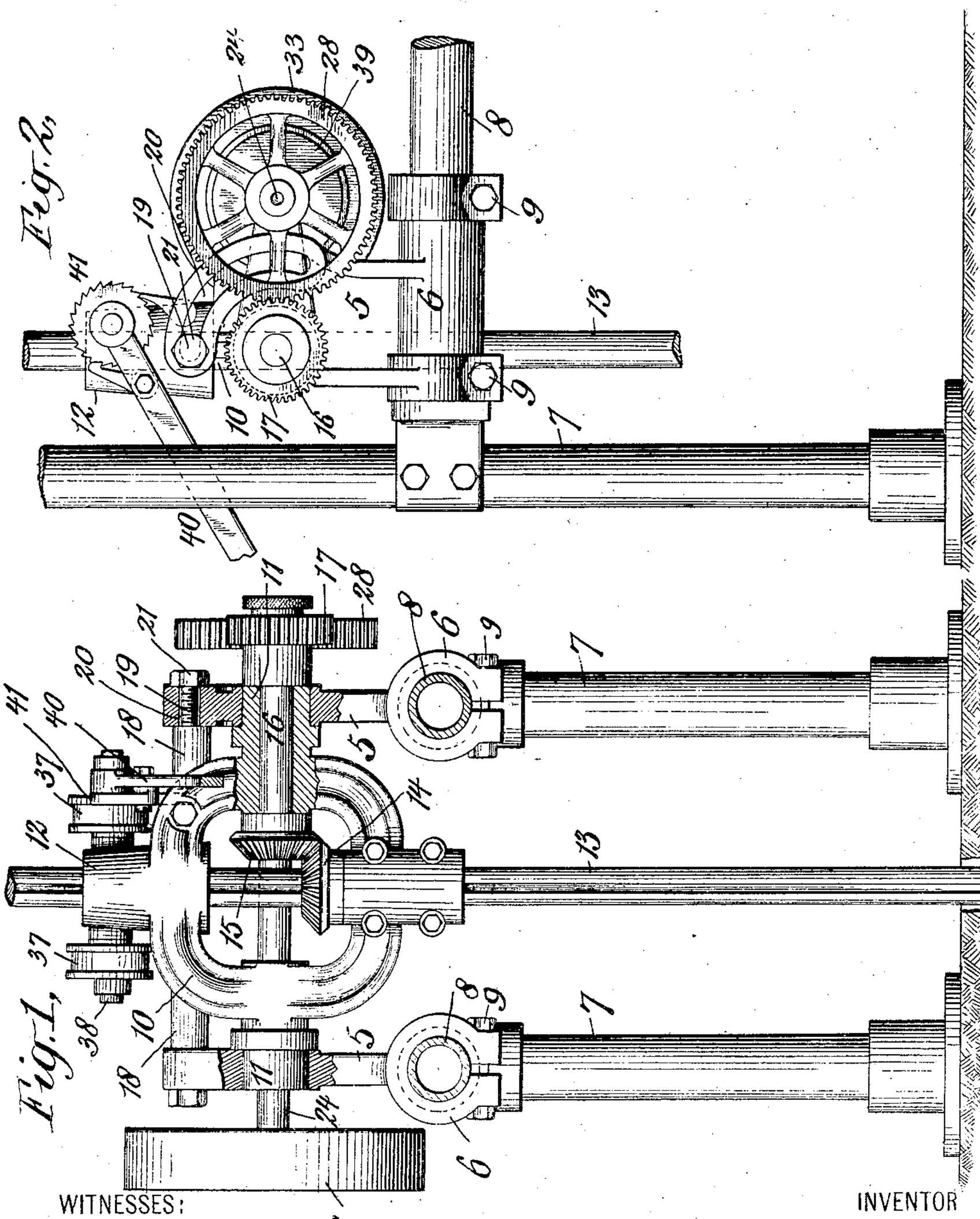

Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 3.

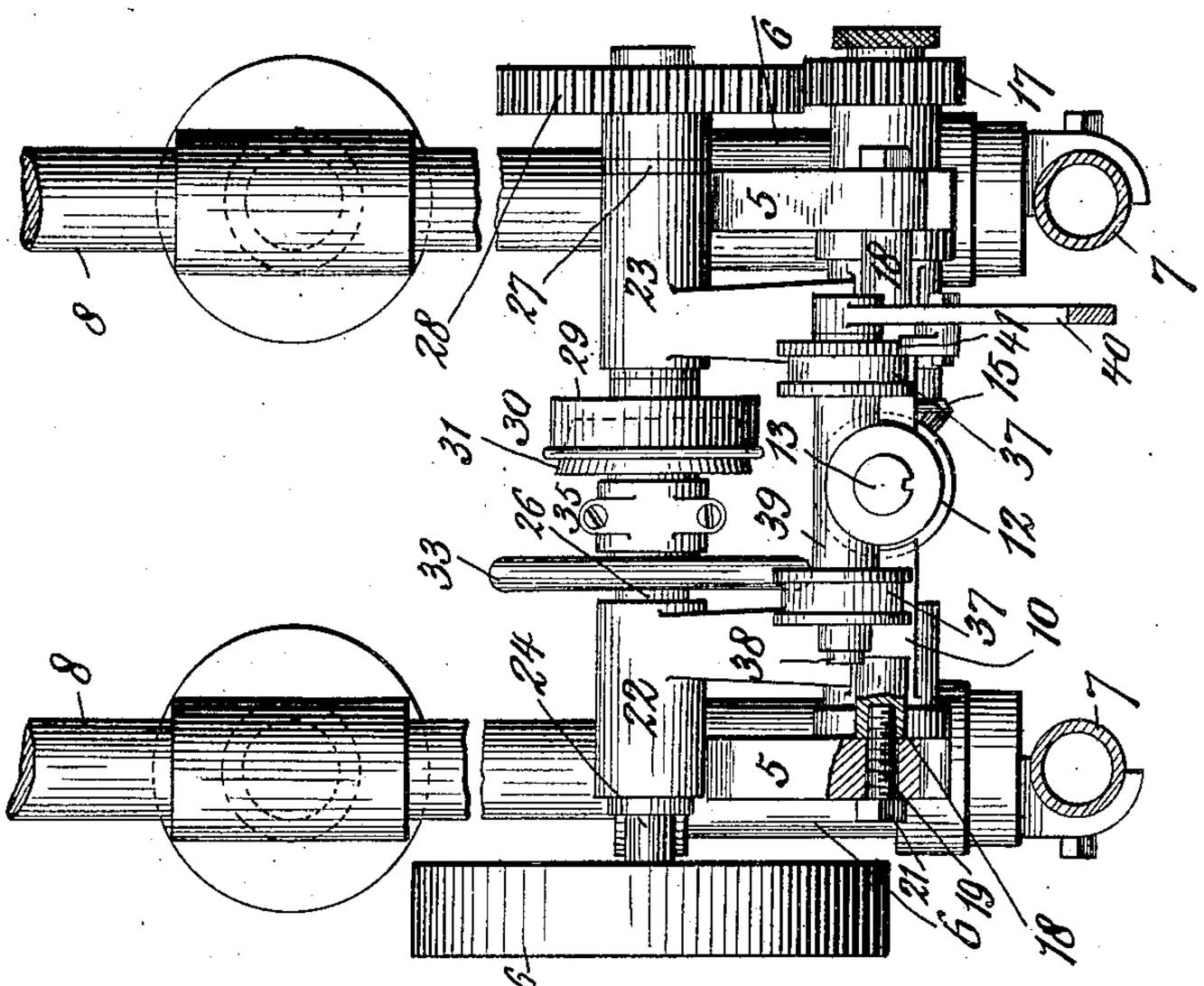
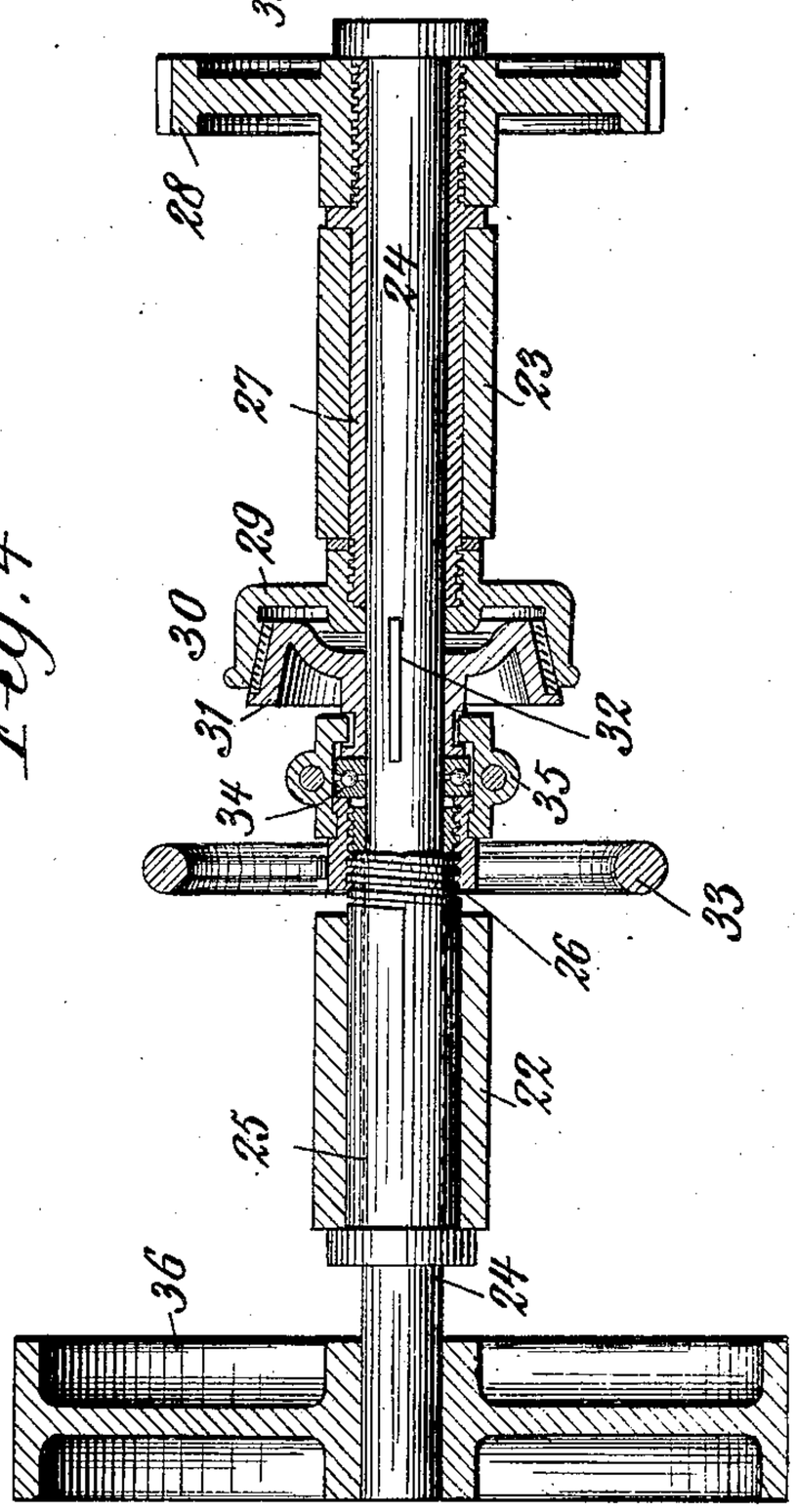


Fig. 4.



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CORE-DRILLING APPARATUS.

No. 877,528. Specification of Letters Patent. Patented Jan. 28, 1908.

Application filed May 29, 1907. Serial No. 376,299.

To all whom it may concern:

Be it known that I, COLEMAN A. TERRY, a citizen of the United States of America, and a resident of the city of New York, county and State of New York, have invented certain new and useful Improvements in Core-Drilling Apparatus, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to improvements in core drilling apparatus, and the main objects of my invention are to produce a simple drill, compact in form and light in weight so that it may be easily shipped from place to place; to provide for the ready adjustment of the drill so that it may be pointed in any direction, and to improve and simplify clutch mechanism therefor such as is employed for connecting and disconnecting the rotating mechanism with the source of power.

To these ends my invention consists in certain novel details of construction and combination of parts as will hereinafter be more fully set forth.

I will now proceed to describe an apparatus embodying my invention, having reference to the accompanying drawings illustrating same, and will then point out the novel features in claims.

In the drawings: Figure 1 is a view in front elevation of the drill, certain parts being broken away in section. Fig. 2 is an end view of the same. Fig. 3 is a top view of the same. Fig. 4 is a detail view in central longitudinal section through the drive shaft.

The frame work of the machine comprises two side frames 5, 5, said side frames including clamp members 6, 6, which are arranged to be supported upon, and secured to, cylindrical supports such as may suitably be composed of pipe sections. As herein illustrated, the supporting structure comprises two vertical members 7, 7, and two horizontal members 8, 8, rigidly secured together. The members 7 and 8 are preferably of piping to secure strength and lightness, while the clamps 6 are adapted to be mounted upon either vertical or the horizontal members as may be desired.

In the drawings the machine is shown as supported by the horizontal members 8, the said clamps being provided with bolts 9 by which the machine may be secured in position against accidental movement. Journaled in suitable bearings in the side frames 5 is a swinging yoke frame 10, said yoke frame having trunnions 11 which form the said pivotal support therefor, and vertically disposed hubs 12 which form bearings for the vertical drill spindle 13. A miter gear-wheel 14 is splined upon the said drill spindle 13, the said gear-wheel 14 being arranged in mesh with a corresponding miter gear-wheel 15, the latter mounted upon a short horizontal shaft 16 which is journaled in the swinging yoke frame 10 concentric with the horizontal axis thereof, the said shaft passing through one of the said trunnions 11. A pinion 17 is also secured to the said shaft 16 at the outer end thereof, as is shown. The said swinging yoke frame 10 is provided with laterally extending bosses 18 from which studs 19 project endwardly, the said studs passing through slots 20 arranged in the said side frames 5 concentric with the horizontal axis of the yoke frame and extending through an arc of ninety degrees.

Nuts 21, mounted upon the studs 19, clamp the bosses 18 to the side frames so as to secure the swinging yoke frame against movement upon its axis with respect to the side frames 5 after it had been adjusted, but which permit adjustment of the said swinging frame through an angle of ninety degrees when desired. This adjustment of the swinging yoke frame 10 will present the drill rods for drilling downwardly or any angle therefrom up to a horizontal position forwardly with respect to the supporting elements 7. By clamping the side frames to the vertical elements 7 instead of to the horizontal members 8, further adjustment may be had between the horizontal and a vertical position in the upward direction. Adjustment for the next ninety degrees around the circle may be obtained by again clamping the side frames 6 upon the horizontal member 8 but in an inverted position, while an adjustment through the final ninety degrees of the circle may be obtained by once more returning the side frames to the vertical members 7, but in a position inverted from which they were formerly placed.

The yoke frame 10 is provided at the rear with bearing hubs 22, 23, one upon each side thereof, said hubs arranged in line with each other and constructed to form a bearing support for a drive shaft 24. The hub 22 has secured thereto a sleeve or bushing 25, the interior of which forms the actual bearing for the said shaft 24, at that end thereof, the

said sleeve or bushing having a portion 26 extending beyond the said hub 22, said portion being exteriorly screw-threaded, as shown more particularly and in detail in Fig. 4 of the drawings. A sleeve 27 is rotatably mounted in the other said hub 23, and the said sleeve 27 carries at one end thereof a spur-gear 28 which is arranged in mesh with the aforesaid pinion 17, while at the other end thereof it carries the female member 29 of a friction clutch 30. The member 29 and gear-wheel 28 are rigidly secured to the sleeve 27 so as to partake of the movements thereof at all times, but the said sleeve 27, and hence the said clutch member and gear-wheel, are loosely mounted with respect to the shaft 24. The male member 31 of the clutch 30 is mounted upon the said shaft 24, being connected thereto by a spline 32, whereby a limited longitudinal movement thereof is permitted upon the said shaft 24, but the said member and shaft are compelled at all times to rotate together. An operating member 33, including a hand wheel, is mounted upon the portion 26 of the stationary sleeve or bushing 25, an anti-friction bearing 34 being arranged between the hub of the said member 33 and the hub of the clutch member 31. By rotating the member 33 in one direction, the said member 31 will be forced toward the member 29 to cause the said clutch members to so engage each other as to force the shaft 24 to positively transmit rotary movements to the gear-wheel 28. On the other hand, when the member 33 is adjusted in the other direction, pressure from the member 31 will be released and the said shaft 24 may at such times rotate freely without transmitting any movement to the said wheel 28 and hence to the drill. When the clutch members are engaged the sleeve 27 and shaft 24 rotate together, a bearing being formed between the sleeve 27 and the hub 23. When the clutch members are disengaged the sleeve 27 remains at rest in the hub 23, and the shaft then finds a bearing in the said sleeve 27, as will be well understood.

In order to enforce the disengagement of the clutch member 31 from the member 29, I have provided a collar 35 which engages the hubs of the operating member 33 and the clutch member 31 respectively, said collar being arranged to bridge over the anti-friction thrust bearing 32.

The foregoing clutch mechanism will be found peculiarly adapted to the present uses. The clutch and operating mechanism is itself exceedingly compact, giving room for long bearings in the hubs 22, 23. The novel arrangement of bearings between the shaft 24, the sleeve 27 and the hub 23 will be found to reduce wear considerably, while by reason of the fact that the entire said mechanism is arranged on a single shaft, which shaft is carried by the swinging frame 10 and connected through gears 28, 17 with the shaft 16 mounted axially with the said swinging frame, a proper drive relation is maintained in any position to which the parts may be adjusted. The said shaft 24 carries a drive pulley 36 by which power may be transmitted thereto, or the said shaft 24 may be turned by hand, if desired.

The relationship of the gearing, and hence the relationship of the speed between the shafts 24, 16, may be varied at will by changing the gears 28, 17 and substituting therefor gears of any desired diameter, the combined diameters of the wheels remaining, of course, at all times unchanged. The relative positions of the pinion 17 and spur-gear 28 may be reversed, if desired, so as to gear the drill down instead of up.

I have provided feed drums 37 upon which may be mounted ropes for the usual or any desired form of rope feed for the drill, said drums secured to a shaft 38, mounted to rotate in a hub 39 carried by the upper vertical sleeve bearing hub 12. A lever 40, with ratchet and pawl mechanism 41, constitutes a convenient means for rotating the said drums, as will be well understood by reference to the drawings.

What I claim is:

1. In core drilling apparatus the combination with two parallel side frames having clamps by which they may be secured to a support, of a swinging yoke frame having trunnions pivoted in said side frames and clamp bolts arranged at a distance from the axis of said trunnions, said side frames having concentric slots for receiving said clamp bolts, a drill rod mounted in and carried by said yoke frame, said drill rod arranged in the plane of, but at right angles to the axis of said yoke frame, a shaft mounted in one of the trunnions of said yoke frame concentric with the axis thereof, and gearing between said shaft and said drill rod.

2. In core drilling apparatus the combination with a support having vertical and horizontal members, of a framework comprising parallel side frames having clamps by which they may be secured either way up to either of said members, a swinging yoke frame having trunnions pivoted in said side frames whereby said yoke frame may swing through an arc of ninety degrees with respect to said side frames, means for clamping said yoke frame in its adjusted position with respect to said side frames, a drill rod mounted in and carried by said yoke frame, said drill arranged in the plane of, but at right angles to the axis of said yoke frame, a shaft mounted in one of the trunnions of said yoke frame concentric with the axis thereof, and gearing between said shaft and said drill rod.

3. In core drilling apparatus the combination with side frames, a swinging yoke frame

pivoted thereto, and a drill operating shaft mounted in said yoke frame, concentric with the pivotal axis thereof, the said frame provided with rearwardly arranged bearings parallel with said shaft, of a drive shaft located in said bearings, a sleeve rotatably mounted in one of said bearings, and freely surrounding the said drive shaft, a gear wheel carried by said sleeve on one side of said bearing, a clutch member carried by said sleeve at the other side of said bearing, a complementary clutch rotatably mounted upon said shaft, controlling means for operatively connecting and disconnecting the said clutch members, and a gear upon said drill operating shaft in mesh with the gear aforesaid.

4. In core drilling apparatus the combination with side frames, a swinging yoke frame pivoted thereto, and a drill operating shaft mounted in said yoke frame, concentric with the pivotal axis thereof, the said frame provided with rearwardly arranged bearings parallel with said shaft, of a drive shaft located in said bearings a sleeve, rotatably mounted in one of said bearings, and freely surrounding the said drive shaft, a gear wheel carried by said sleeve on one side of said bearing, a clutch member carried by said sleeve at the other side of said bearing, a complementary clutch rotatably mounted upon said shaft, a stationary externally threaded sleeve projecting from the other said bearing, an operating member mounted thereon, the said complementary clutch member located between said operating member and the first said clutch member, means for transmitting the longitudinal movements of said operating member to said first named clutch member, and a gear upon said drill operating shaft in mesh with the gear aforesaid.

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