

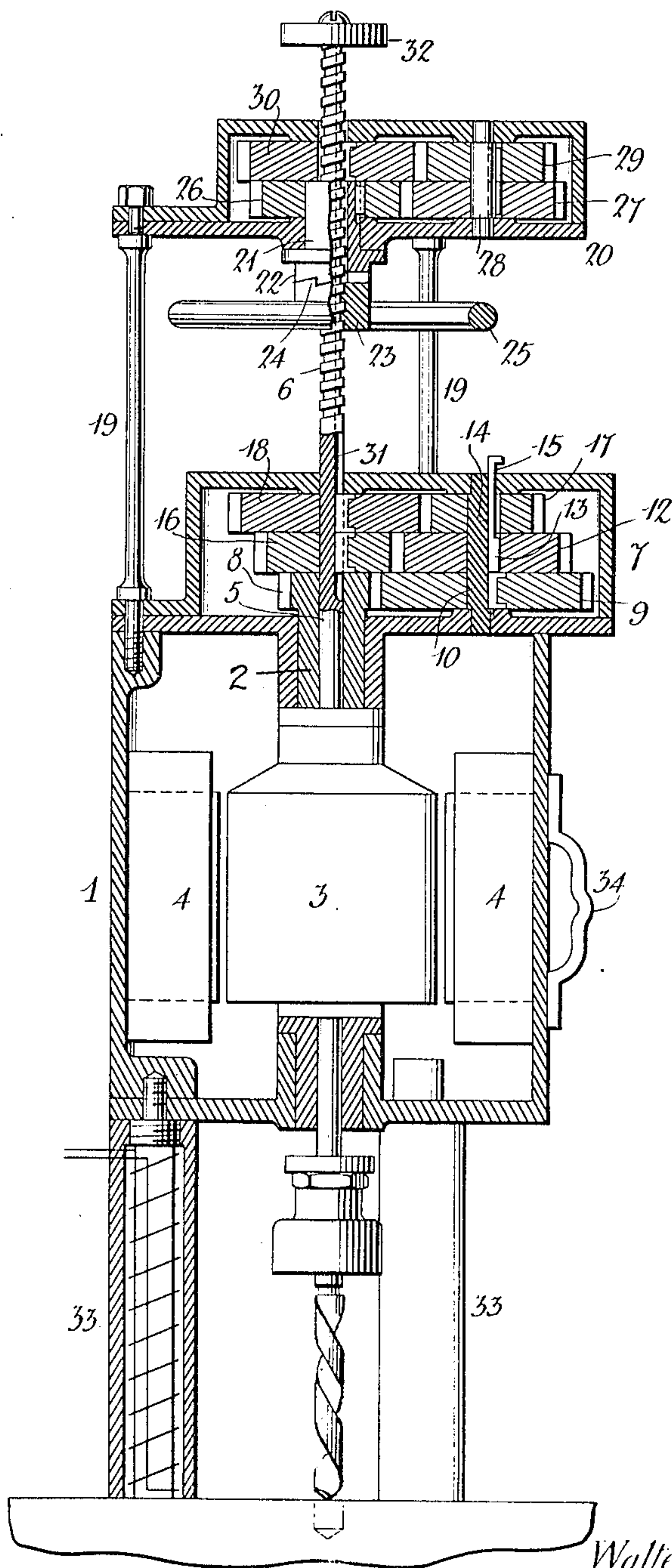
W. KLOUSE & C. H. BROCKETT.

MAGNETIC DRILL FRAME.

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UNITED STATES PATENT OFFICE.

WALTER KLOUSE AND CHESTER H. BROCKETT, OF COLUMBUS, OHIO.

MAGNETIC DRILL-FRAME.

No. 919,597.

Specification of Letters Patent.

Patented April 27, 1909.

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To all whom it may concern:

Be it known that we, WALTER KLOUSE and CHESTER H. BROCKETT, citizens of the United States, residing at Columbus, in the county of Franklin, and State of Ohio, have invented certain new and useful Improvements in Magnetic-Drill Frames; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in magnetic power drills.

The object of the invention is to provide a drill of this character having means by which the same may be securely held in engagement with the work being bored or drilled.

Another object is to provide a differential speed driving mechanism for the drill and means whereby the drill may be automatically fed to the work.

A further object is to provide a drill constructed and arranged in such manner as to permit the bit to be withdrawn from the work without stopping the operation of the same.

With the foregoing and other objects in view, which will appear as the nature of the invention is better understood, the invention consists of certain novel features of construction, combination and arrangement of parts, as will be hereinafter fully described and claimed.

In the accompanying drawings, is shown a vertical longitudinal sectional view of a drill constructed and arranged in accordance with the invention.

Referring more particularly to the drawings, 1 denotes the main frame or casing of the drill in the center of which is revolubly mounted a tubular shaft 2 on which is fixedly mounted the armature 3 of an electric motor by means of which said shaft is operated. The pole pieces 4 of the motor are secured to the inner sides of the frame or casing 1 in position to form the magnetic field of the motor. Loosely mounted in the tubular shaft 2 is a drill shank or stem 5 which projects upwardly and is provided on its upper end with a series of coarse screw-threads 6.

Secured on the upper side of the frame or casing 1 is a supplemental casing 7 in which is arranged a differential driving mechanism by means of which the drill or shank may be revolved at different rates of speed. The

driving mechanism comprises a spur gear 8 which is fixedly mounted on the upper end of the tubular armature shaft 2 and is adapted to engage a spur gear 9 which is fixedly mounted upon a counter-shaft 10 revolubly mounted in the casing 7, as shown. Loosely mounted on the shaft 10 immediately above the gear 9 is a similar but somewhat smaller gear 12, said gear being loosely mounted on the shaft 10 and adapted to be locked into engagement therewith by means of a key 13 which is slidably mounted in a key-way 14 formed in one side of the shaft 12. The key 13 is provided with an operating stem 15 which projects upwardly through the key-way 14 and extends above the casing 7 in position to be grasped by the operator to shift the key 13 into and out of engagement with the gear 12, thereby locking the gear 12 to the shaft or releasing the same therefrom. The gear 12 is adapted to engage a gear 16 which is keyed to the operating shank or stem of the drill whereby the latter is driven at a certain rate of speed.

Loosely mounted upon the counter-shaft 10 above the gear 12 is a smaller gear 17 which is adapted to be locked into engagement with said shaft 10 by the key 13 which is shifted in the key-way 14 by the stem 15, as hereinbefore described.

When the key 13 is engaged with the gear 17, to lock the same to the shaft 10, the gear 12 will be released from the shaft 10 as will be understood. The gear 17 is engaged with a much larger gear 18 which is keyed to the stem or shank of the drill to revolve the same at a different rate of speed than when operated by the gear 16, as hereinbefore described, thus providing a changeable speed mechanism by means of which the drill shank is operated.

Attached to the casing 1 by supporting rods 19 is a casing 20 in which is arranged a feed mechanism adapted to automatically feed the drill shank or stem forwardly to engage the drill with the work. The feed mechanism comprises a clutch sleeve 21 which is loosely mounted on the threaded upper end of the shank 6 and in the lower side of the casing 20. On the lower face of the sleeve 21 is formed a pair of ratchet or clutch teeth 22 which are adapted to be engaged by a feed nut 23 which has a screw-threaded engagement with the threaded upper end of the shank 6 and is provided on its upper face

with clutch teeth 24 to engage a corresponding pair of clutch teeth 22 of the sleeve 21 thereby locking said nut into operative engagement with the sleeve. The nut 23 is provided with a hand-wheel 25 by means of which the same is turned to engage or disengage the teeth 24 thereon with or from the teeth 22 of the sleeve.

On the sleeve 21 within the casing 20 is fixedly mounted a gear wheel 26 which is engaged with a gear wheel 27 keyed to a counter-shaft 28 journaled in the casing 20, as shown. On the shaft 28 above the gear 27 is fixedly mounted a gear 29 which is adapted to engage a gear 30 splined on to the threaded upper end of the shank 6 and adapted to be operated thereby. When the gear 30 is revolved by the shank 6, the motion is imparted through the gears 29 and 27 to the gear 26 on the clutch sleeve 21 and through said sleeve 21 to the feed-nut 23 when the latter is engaged therewith, revolving said nut 23 and causing the shank or stem 6 of the drill to be fed downwardly, thereby automatically projecting the drill into engagement with the work, the feeding of the drill being thus produced through a system of gears actuated by the movement of the drill shank or stem.

The drill stem or shank 6 is provided with an elongated key-way 31 which extends from the spur gear pinion 8 to the upper end of the shank and is engaged by the keys which lock the gears 16 and 18 and the gear 30 thereto. On the upper end of the stem or shank 6 is a swiveled head or knob 32 by means of which the stem or shank may be held and which enables the drill to be drawn outwardly through the tubular armature shank 2 to disengage the bit from the work without stopping the operation of the drill, the outward movement of the shank 6 being permitted by the elongated key-way 31 which provides for the movement of the shank through the gears 16, 18 and 30 which are keyed thereto, as hereinbefore described. It will be understood that before the shank may be drawn outwardly, it will be necessary to screw the feed nut 23 inwardly to disengage the same from the clutch sleeve 21.

On the outer end of the casing 1 is secured a series of electro-magnets 33 by means of which the drill frame is adapted to be held

into engagement with the work by magnetic attraction and without other fastening device.

If desired, the casing 1 may be provided with a suitable handle 34 by means of which the drill may be carried or by means of which the weight of the drill may be supported from a pulley or crane when the drill is applied horizontally to a surface to be operated upon.

By means of a drill constructed as herein shown and described, the same may be quickly and readily placed in position and secured upon the work to be drilled, the operation of the drill being readily controlled by the operator and determined by the relative diameters of the gear wheels by which the same is driven.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention, as defined by the appended claim.

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

In a drill of the character described, the combination with a support, a drill spindle mounted to rotate within said support, means to drive said spindle, means to feed the spindle longitudinally which comprises a sleeve loosely mounted upon the spindle, a gear connected to said sleeve, a gear splined on the spindle, a clutch one member of which has a threaded connection with the spindle, the other member being integral with said sleeve, a gear train connection between the sleeve gear and the gear which is splined on the spindle, and means whereby the threaded clutch member may be rotated on the spindle to disconnect it from the sleeve member.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

WALTER KLOUSE.
CHESTER H. BROCKETT.

Witnesses:

FRANK T. CLARKE,
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