A. GODLEWSKI.

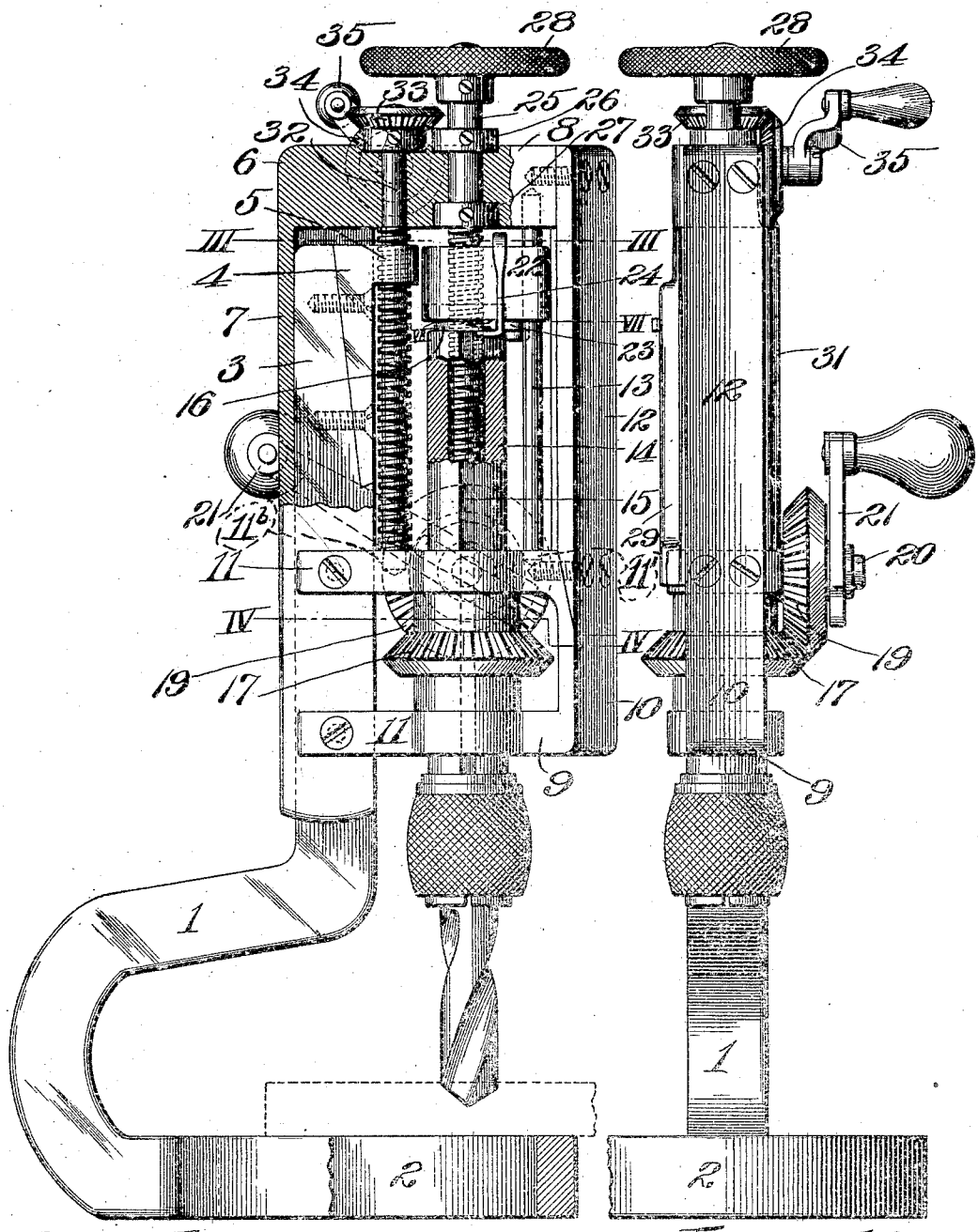
DRILL.

APPLICATION FILED JUNE 21, 1909.

959,055. Patented May 24, 1910.

2 SHEETS—SHEET 1.

Fig. I. Fig. II.



Attest:
Wm. A. Scott.
E. B. Lincoln

Inventor:
Anthony Godlewski,
by E. J. Knight
Atty

A. GODLEWSKI.

DRILL.

APPLICATION FILED JUNE 21, 1909.

959,055. Patented May 24, 1910.

2 SHEETS—SHEET 2.

Fig. III.

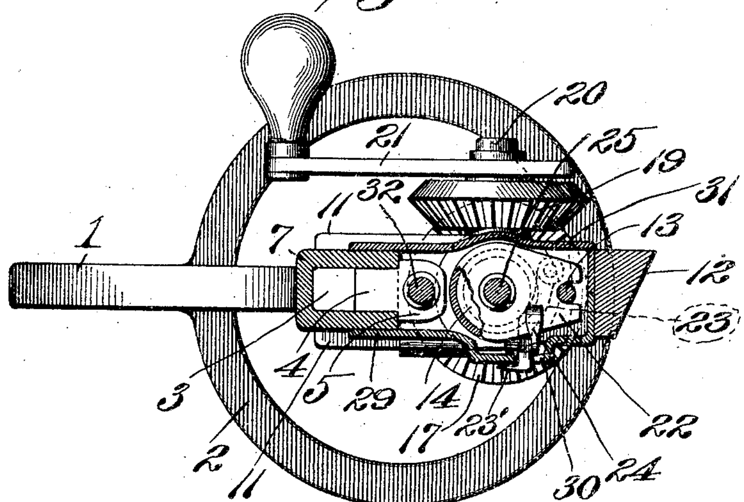


Fig. IV.

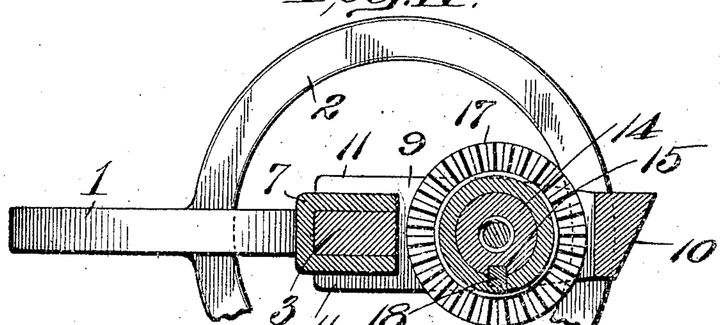


Fig. VI.

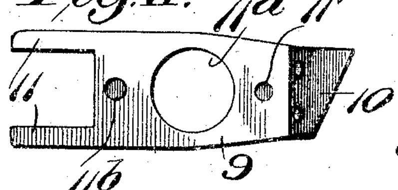


Fig. V.

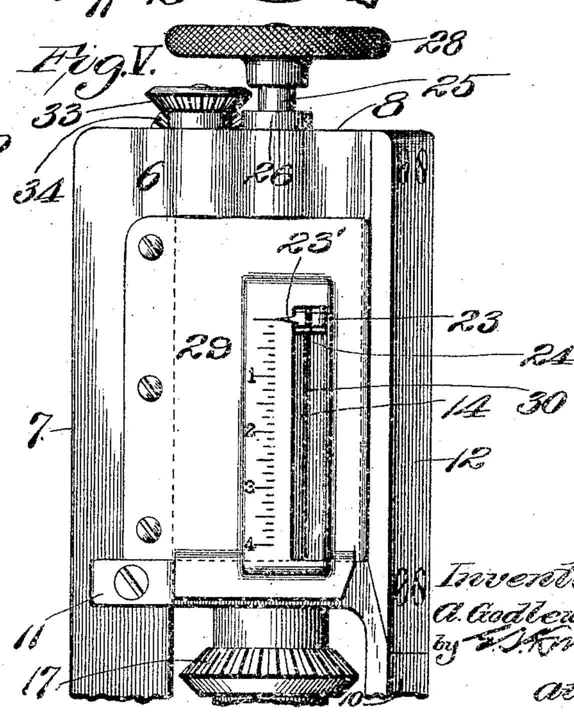
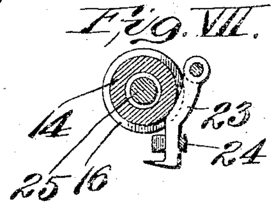


Fig. VII.



Attest:
Wm. H. Scott.
E. B. Lium

Inventor:
A. Godlewski
by E. S. Knight
Atty.

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ANTHONY GODLEWSKI, OF ST. LOUIS, MISSOURI.

DRILL.

959,055. Specification of Letters Patent. Patented May 24, 1910.

Application filed June 21, 1909. Serial No. 503,329.

To all whom it may concern:

Be it known that I, ANTHONY GODLEWSKI, a subject of the Czar of Russia, residing at the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Drills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a drill adapted to be manually operated and which is intended to be used in lieu of breast drills of similar type, but in which provision is made for the feeding of the drill bit by mechanical means, as distinguished from manual pressure for the feeding action.

Figure I is a view partly in side elevation and partly in vertical section of my drill. Fig. II is a front elevation of the drill. Fig. III is a cross section taken on line III—III Fig. I, looking toward the base. Fig. IV is a cross section taken on line IV—IV Fig. I, looking toward the base. Fig. V is a side elevation of the upper portion of the drill. Fig. VI is a plan view of the guide frame through which the spindle of the drill operates. Fig. VII is a cross section taken on line VII—VII Fig. I, looking toward the base.

In the accompanying drawings: 1 designates the stand of my drill which comprises a base 2, preferably of circular shape, and a standard 3 disposed vertically above said base. The standard has removably attached to it, by a scarf joint, at its upper end a bracket 4 that is provided with an internally screw threaded upper arm 5 that is offset from the standard 3.

6 designates a supporting frame having a leg 7 that is slidably fitted to the standard 3, the leg being provided with a channel, as seen in Figs. I, III, and IV, so that it receives and embraces the standard at its two sides and its rear edge. The supporting frame also comprises an upper arm 8 extending at right angles to the leg 7 and the standard 3 which it surmounts.

9 is a guide frame secured to the leg 7 of the supporting frame and comprising a front member 10 having its face inclined relative to the front face of the standard 3 and intermediate and lower arms 11 separated from each other and which are attached to the leg of the supporting frame.

12 is a front plate secured, by a scarf joint, to the front member 10 of the guide frame 9 and the upper arm 8 of the supporting frame 6 in alinement with the front member 10 of said guide frame. This front plate is inclined in a degree corresponding to the degree of inclination of the front member 10 for a purpose to be hereinafter explained.

13 is a guide rod stepped into the under side of the upper arm 8 of the supporting frame 6 and into a recess 11′ provided therefor in the intermediate arm of the guide frame 9.

14 designates a hollow spindle that is operable within and through apertures 11ª in the arms 11 of the guide frame 9 so that it may be rotated therein and move longitudinally therethrough. This spindle is provided with a longitudinal splineway 15 and at its upper end is an annular groove 16.

17 is a bevel gear wheel located between the arms of the guide frame 9 and surrounding the spindle 14. This gear wheel is provided internally with a spline 18, (see Fig. IV), that enters into the splineway in the spindle, thereby providing for the gear wheel acting to rotate the spindle when it is operated and for longitudinal movement of the spindle through said gear wheel. The gear wheel 17 is operated through the medium of a bevel gear wheel 19 that is arranged in mesh therewith, and is loosely mounted upon a stub shaft 20, (see Fig. II), fixed to the intermediate arm of the guide frame 9.

21 is a crank arm attached to the gear wheel 19 and by which it is operated for the purpose of imparting rotation to the bevel gear wheel 17 and consequently to the spindle 14.

22 designates a feed block slidably fitted to the guide rod 13, which acts to hold said feed block from rotation. This feed block is recessed at its under side in order that the upper end of the spindle 14 may enter thereinto and the feed block has pivoted to it at its bottom a locking arm 23, (see full lines Figs. I, V, and VII, and dotted lines Fig. III). The locking arm 23 enters into the annular groove 16 at the upper end of the spindle 14 to connect said spindle to the feed block 22 and support it therefrom in a manner to permit rotation of the spindle, notwithstanding its detachable connection to the feed block, and the locking arm is held in position in said annular groove by a spring arm 24 attached to the feed block and

bearing against the locking arm, (as seen most clearly in Fig. I).

25 designates a feed screw having an unthreaded upper portion that is loosely fitted in the upper arm 8 of the supporting frame 6 and to which is secured collars 26 and 27 that serve to hold the screw from endwise movement. The feed screw has fitted to its upper end a hand wheel 28 by which it may be operated. The threaded portion of the feed screw extends through the feed block 22 with which it engages and also extends into the hollow spindle 14 in which the bore is unthreaded so that the feed screw has no direct action upon said spindle, but the spindle is permitted to turn freely around said feed screw.

In the practical use of my drill, rotation is imparted to the spindle 14 by turning the crank arm 21 which operates the bevel gear wheel 19 and from which power is transmited to the bevel gear wheel 17 that imparts rotation to the spindle in order that a boring bit fitted to the spindle, as illustrated in Fig. I, may operate for drilling action. To cause the boring bit to be fed into the piece of work being drilled, the operator turns the hand wheel 28, whereby the feed screw 25 is rotated and, as this feed screw turns, it acts by operation in the feed block 22 to move said feed block downwardly or forwardly, whereby the feed block in turn acts to exert pressure against the spindle 14, moving it in a corresponding direction; or, in other words, toward the piece of work to which the boring bit is presented, and this feeding action is continued as rapidly as desired, while the spindle is being rotated, or as rapidly as is permissible, due to the nature of the piece of material in which the boring bit is being operated. The work to be drilled or bored may either be laid upon the base 2 and secured thereto by suitable means, or the base may be placed beneath the piece of work, or the side opposite that to which the boring bit is presented, in order that it will serve as a resistance member opposing the boring bit while it is being operated in a piece of work. The drill may also be laid in a flat or horizontal position upon a bench or table when it is to be operated, and it is in view of the drill being so employed that I provide the frame of the drill with the inclined front plate 12 and the guide frame 9 with the inclined front member 10, which are adapted to rest upon the support for the drill in a manner to provide for the drill being so positioned that the crank 21 may be readily operated while the drill is lying down and with the movable parts of the drill sustained out of contact with the support.

To provide for the indication of the depth to which a hole is bored by a boring bit in the use of my drill, I furnish in the drill an indicator that includes a pointer 23′ that extends outwardly from the free end of the locking arm 23 that connects the spindle 14 to the feed block 22. I further provide in this connection a scale plate 29, (see Fig. V), having a longitudinal slot 30 in which the pointer is operable and upon which there is a scale that is traversed by said pointer. By extending the pointer through the slot in the scale plate in such a manner that it may be moved laterally, there is opportunity afforded for the actuation of the locking arm through the medium of the pointer to permit of the feed block being separated from and engaged with the spindle without the necessity of direct access to the parts back of the scale plate. The scale plate also serves as housing member for the upper portion of the drill within the supporting frame and a plate 31, (see Fig. III), is provided at the opposite side of the supporting frame to complete the housing at the point named.

The supporting frame 6 is slidably fitted to the standard of the stand 1 in order that the lower end of said frame may be separated to a considerable degree from the base of the standard before commencing a boring operation and the supporting frame may be thereafter shifted toward said base with the object in view of providing for the drilling of a hole to a greater depth than would be possible if the supporting frame were fixed to the standard. To provide for the shifting of said supporting frame, I employ a shift screw 32 that is loosely fitted in the upper arm 8 of the supporting frame and has a threaded portion operable in the member 5 of the bracket 4, the lower end of the screw being stepped into a recess 11^b in the guide frame 9 shown in Fig. VI. The shift screw has secured to it at its upper end a bevel gear wheel 33, and this gear wheel has arranged in mesh with it a bevel gear wheel 34 journaled to a stud carried by the supporting frame arm 8 and which is equipped with a crank arm 35. It will be readily understood that when the shift screw 32 is rotated through the medium of the crank arm and the bevel gear wheels 34 and 33, it will, by operating in the member 5 of the bracket 4 and turning loosely in the supporting frame arm 8, act to shift said supporting frame downwardly on the standard, as desired.

By providing means whereby the feed block 22 is detachably connected to the spindle 14, I make it possible to allow the drill bit to remain in a hole which has been partially bored thereby, pending the lowering of the supporting frame 6, as described. It will be evident that after the feed block has been detached from the spindle, it may be elevated through the medium of the feed screw 25 to any desirable degree, while the spindle remains in the position to which it has been previously moved and that when

the supporting frame is lowered so that its lower end approaches the base of the drill and the drill chuck, the feed block may be again attached to the spindle and be ready for continued actuation thereof in the further drilling operation.

I claim:—

1. A drill comprising a stand having a standard, a bracket having an internally screw-threaded offset arm and secured to the standard, a supporting frame having an arm and a leg slidably fitted to the standard, a guide frame having an arm and secured to the leg, a shift screw stepped into the arm of the guide frame, operable in the offset arm and loosely fitted in the arm of the supporting frame and means for operating the shift screw.

2. A drill comprising a stand having a standard, a supporting frame having an upper arm and fitted to the standard, a guide frame having intermediate and lower arms secured to the supporting frame, a guide rod stepped into the intermediate arm and into the upper arm, a hollow spindle having an annular groove at its upper end and operable in the intermediate and lower arms, a feed block slidably fitted to the guide rod and into which the upper end of the hollow spindle is stepped, a feed screw extending through the feed block and into the hollow spindle and loosely fitted in the arm of the supporting frame, and a locking arm pivoted to the underside of the feed block and adapted to engage in the annular groove of the hollow spindle and support the latter from the feed block.

3. A drill comprising a stand having a standard, a supporting frame having an upper arm and fitted to the standard, a guide frame having intermediate and lower arms secured to the supporting frame, a guide rod stepped into the intermediate arm and into the upper arm, a hollow spindle having an annular groove at its upper end and operable in the intermediate and lower arms, a feed block slidably fitted to the guide rod and into which the upper end of the hollow spindle is stepped, a feed screw extending through the feed block and into the hollow spindle and loosely fitted in the arm of the supporting frame, a locking arm pivoted to the underside of the feed block and adapted to engage in the annular groove of the hollow spindle and support the latter from the feed block, and a spring secured to the feed block and bearing against the locking arm for seating the latter.

4. A drill comprising a stand having a standard, a supporting frame having an upper arm and fitted to the standard, a guide frame having intermediate and lower arms secured to the supporting frame, a guide rod stepped into the intermediate arm and into the upper arm, a hollow spindle having an annular groove at its upper end and operable in the intermediate and lower arms, a feed block slidably fitted to the guide rod and into which the upper end of the hollow spindle is stepped, a feed screw extending through the feed block and into the hollow spindle and loosely fitted in the arm of the supporting frame, a plate having a longitudinal slot, and a locking arm pivoted to the underside of the feed block and adapted to engage in the annular groove of the hollow spindle and support the latter from the feed block and having a pointer extending through the slot of the plate and providing means for shifting the locking arm.

ANTHONY GODLEWSKI.

In presence of—
WM. H. SCOTT,
E. B. LINN.