

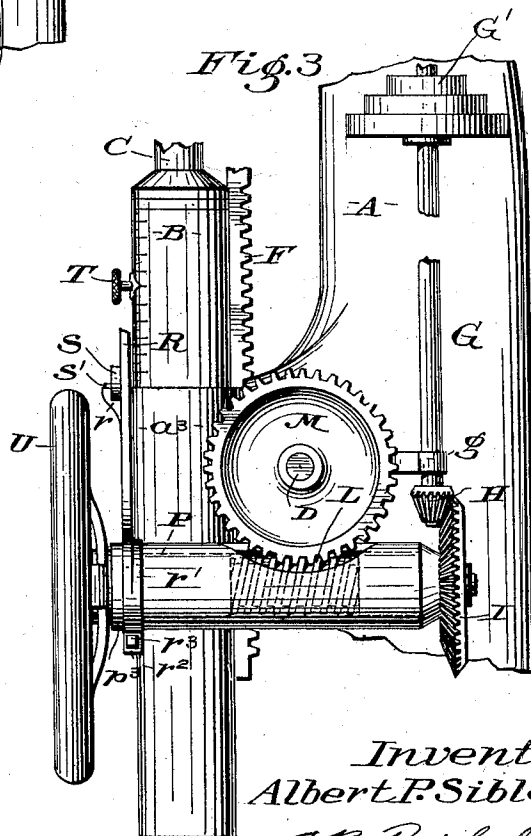
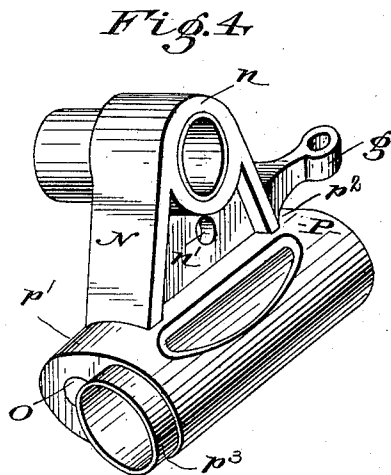
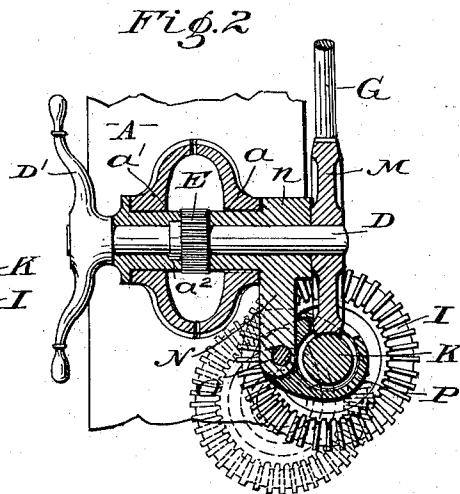
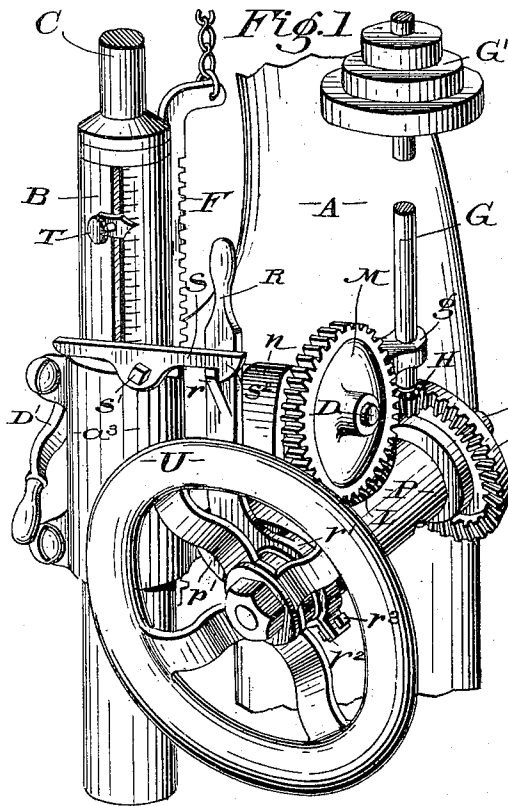
(No Model.)

A. P. SIBLEY.

AUTOMATIC STOP FOR SELF FEED DRILLING MACHINES.

No. 600,598.

Patented Mar. 15, 1898.



Witnesses:-

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Inventor-
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 By his Atty. *A. C. Reichelt*

UNITED STATES PATENT OFFICE.

ALBERT P. SIBLEY, OF SOUTH BEND, INDIANA.

AUTOMATIC STOP FOR SELF-FEED DRILLING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 600,598, dated March 15, 1898.

Application filed April 21, 1897. Serial No. 633,118. (No model.)

To all whom it may concern:

Be it known that I, ALBERT P. SIBLEY, a citizen of the United States, and a resident of South Bend, in the county of St. Joseph and State of Indiana, have invented certain new and useful Improvements in Automatic Stops for Self-Feed Drilling-Machines, of which the following is a specification.

My invention is especially designed for use upon the usual standard upright drill, having a vertical spindle adapted to be raised and lowered by a rack-sleeve provided with an adjustable stop thereon and sliding in a head carrying a combined hand and automatic feed-gear normally held in working position by a latch-lever supported on said head and adapted to be tripped by the adjustable stop on the sleeve of the drill-spindle to disengage the automatic feed-gear when the holes have been drilled to the required depth.

The object of my invention is to provide a feed-gear-supporting head and automatic stop-feed-gear mechanism which will be strong, simple, easily fitted to operate with certainty and quickly at the exact moment, which will not subject the gearing to excessive wear or breakage when thrown into or out of gear, and to construct and arrange said parts in such manner that the attendant may quickly operate the stop mechanism by hand either to throw it into or out of gear without interfering in any way with the independent feed and quick return used upon drills of this class.

My invention consists in certain constructions, combinations, and arrangements of parts hereinafter particularly described and claimed with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of so much of a drill-press as is necessary to show my automatic stop-gear; Fig. 2, a vertical sectional elevation thereof in the line of the transverse feed-gear shaft, showing the stop mechanism in gear by full lines and said mechanism out of gear by dotted lines; Fig. 3, a similar side elevation thereof; and Fig. 4, a perspective view, detached, of the shaft-supporting hinge-block for connecting the transverse feed-gear shaft with the worm-shaft of the automatic gear.

The framework and operating parts of the

machine other than in the particulars hereinafter described are of the usual or any suitable construction.

The frame-head A supports the sleeve B to slide vertically therein with the drill-spindle C, and also provides bearings for a transverse horizontal gear-shaft D, carrying a pinion E, inclosed within the frame-head to engage with a rack-bar F, secured to the sleeve, and thus raise and lower the drill-spindle in a well-known manner.

The driving-gear, as herein shown, consists of a vertical gear-spindle G, supported in brackets g upon the frame and provided at its upper end with a cone-pulley G', driven from a similar pulley on the drill-spindle or in any well-known manner, and the lower end of said spindle carries a bevel-pinion H, which engages with a bevel gear-wheel I, secured to the rear end of a horizontal worm-shaft K, supported in a novel manner upon the frame-head and carrying a worm L, which engages with a worm-wheel M, secured to the outer end of the transverse gear-shaft D, the said gear and worm shafts being arranged at right angles to each other and also at right angles to the vertically-moving drill-spindle.

A hanger-bracket N has a sleeve n, which fits in a bearing in the frame-head A and extends inwardly to the adjacent face of the pinion E to provide a bearing for the transverse gear-shaft D, which is preferably made integral with the pinion E and is inserted together therewith through the enlarged sleeve-opening a in the said frame-head or through a similarly-enlarged opening a' upon the opposite side of said head, the latter being fitted with a bushing a² to fit and form a bearing for the reduced portion of said shaft, the outer of which is fitted with a double handle-bar D', by means of which the drill-spindle may be raised and lowered with a quick motion directly by hand in a well-known manner. The hanger-bracket N, being thus supported upon the frame and connected to the transverse gear-shaft, is secured fixedly from turning with or upon said shaft by a set-bolt n', which passes through it and is screwed into the frame-head. The body of the bracket N is of triangular shape and its base is bored horizontally to receive a pivot-bolt O, the ends of which project from said bracket and

pass through lugs $p'p'$, formed upon the inner side of a sleeve P, which is truly bored parallel with the center line of said lugs to carry the horizontal worm-shaft K in a plane at right angles to that of the horizontal transverse gear-shaft D to hold the worm closely up and in gear with the toothed periphery of the worm-wheel M when the automatic gear is to be used to drive the drill-spindle. The axis of the sleeve P is held in the said position horizontally by means of a hand-lever R, secured to a turned hub p^3 upon the end thereof, and the free end of said lever is held in an upright position by a latch-lever S, pivoted at s' to the drill-spindle bearing a^3 of the frame-head, a hook s^2 of the latch-lever engaging with a lug r of the hand-lever.

The latch-lever S is held horizontally and the free end thereof is opposite the hook s^2 and is pressed down by a trip-pin T, adjustably secured in any well-known manner upon the drill-spindle C to register with graduations thereon, which latter indicate the depth of the holes to be drilled. The trip-lever T when thus pressed down releasing the hand-lever R, the latter, together with the sleeve P, will swing upon the pivot-bolt O and drop the worm L upon shaft K out of gear with the worm-wheel M, as shown by dotted lines in Fig. 2, thus instantly checking the feed of the drill-spindle. The shaft D is, when thus released from the automatic feed-worm, free to be operated by the double handle-bar D' when a quick-return movement is to be imparted to the drill-spindle.

The fixed end of the hand-lever R has a strap r' with split lugs r^2 , held adjustably together by a set-bolt r^3 to clamp the hub p^3 of the sleeve P, and thus provide means for securing the lever R at any desired position upon said hub to provide for lost motion and to adapt the said lever to hold the worm L in close engagement with the worm-wheel M when the hand-lever R is in its raised position. The hand-lever R is thus held in position to be easily reached when it is desired either to throw the automatic feed into or out of gear with the transverse feed-shaft and drill-spindle.

A hand-wheel U is secured to the forward end of worm-shaft K, by means of which the drill-spindle may be slowly and regularly fed by hand, the shaft G being first disconnected either from the driving or the driven shaft in any well-known manner—as, for instance, by lifting the bevel-pinion H from engagement with the bevel-gear I upon the inner end of the worm-shaft.

The sleeve is pivoted to the frame at one side of the center of the worm-shaft, and the distance therefrom may be such that the said sleeve may be oscillated upon a horizontal axis, located at any suitable or convenient point, which will allow the said shaft to be lifted or depressed directly away from the periphery of the worm-wheel, and thus quickly clear the worm from the teeth or engage it

therewith without clash or undue friction. As the shaft G is continuously rotating the pinion H and gear I will start the shaft K and worm L to moving before the latter is completely engaged with the worm-wheel M, thus insuring a quick connection.

The arrangement of the drill-spindle, the gear-shaft for operating the same, and the driving-gear shaft and the means for supporting the latter to allow it to automatically drop away from the gear upon the spindle-operating gear-shaft provides a very simple, strong, and inexpensive construction of parts, which may be fitted up in a workmanlike manner without the employment of devices or instrumentalities which are liable to break and get out of order. The gearing will freely engage and disengage one with the other, which would not be the case were the driving-gear shaft supported upon a pivot-bolt placed parallel to the spindle-operating gear-shaft.

I claim as my invention and desire to secure by Letters Patent—

1. An automatic stop for feed-gearing, comprising a worm gear and shaft, supported in fixed bearings and a worm and worm-shaft supported in a hinged bearing pivoted to oscillate upon an axis arranged at right angles to the axis of the worm-gear, substantially as described.

2. The combination with the frame-head of the drill-spindle and the gear-shaft for operating the same supported in fixed bearings therein, a driving-gear shaft supported to oscillate upon an axis at right angles to said spindle-operating gear-shaft, gearing to connect said shafts and means for automatically breaking said connection to allow the gear upon the driving-shaft to drop away from the gear upon the spindle-operating shaft, substantially as described.

3. The combination with the frame-head of the drill-spindle and gear-shaft for operating the same supported in fixed bearings therein, a worm-wheel fixed to said shaft, a sleeve pivoted to the frame-head upon an axis at right angles to said gear-shaft, a worm and shaft supported in said sleeve, driving mechanism for the worm-shaft, and a latch for connecting the frame and pinion-sleeve, substantially as described.

4. The combination with the frame-head of the drill-spindle and gear-shaft for operating the same supported in fixed bearings therein, a worm-wheel fixed to said shaft, a sleeve pivoted to the frame-head upon an axis at right angles to said gear-shaft, a worm and shaft supported in said sleeve, driving mechanism for operating the worm-shaft, a hand-lever secured to said shaft and a latch supported upon the frame-head and automatically operated to release the lever and drop the worm-shaft out of gear, substantially as described.

5. The combination with the frame-head, the drill-spindle and a gear-shaft for operating the same, a worm-wheel secured thereto,

a sleeve-bearing pivoted to the frame-head provided with an end hub, a worm-shaft supported in said sleeve having a latch upon the frame-head, an operating-lever having a
5 clamping-strap to fit the sleeve-hub, and a set-bolt for securing it adjustably thereon, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in the presence of two subscribing witnesses.

ALBERT P. SIBLEY.

Witnesses:

B. KRUEPER,
WM. H. ROWE.