

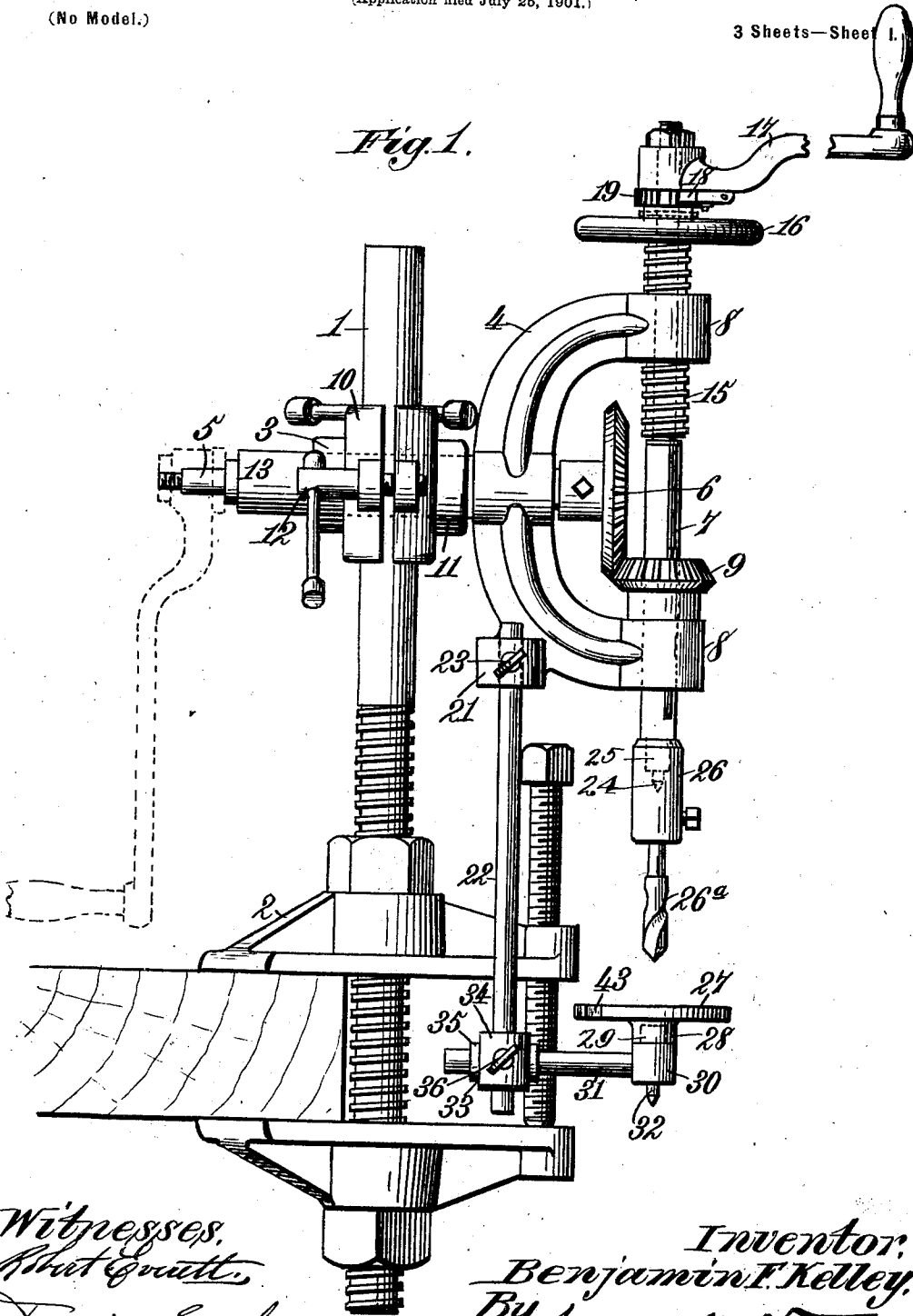
B. F. KELLEY.
DRILLING MACHINE.

(Application filed July 25, 1901.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



Witnesses,
Robert Grubb,
Dennis Sumbly.

Inventor,
Benjamin F. Kelley,
By James L. Norris
Atty.

No. 699,535.

Patented May 6, 1902.

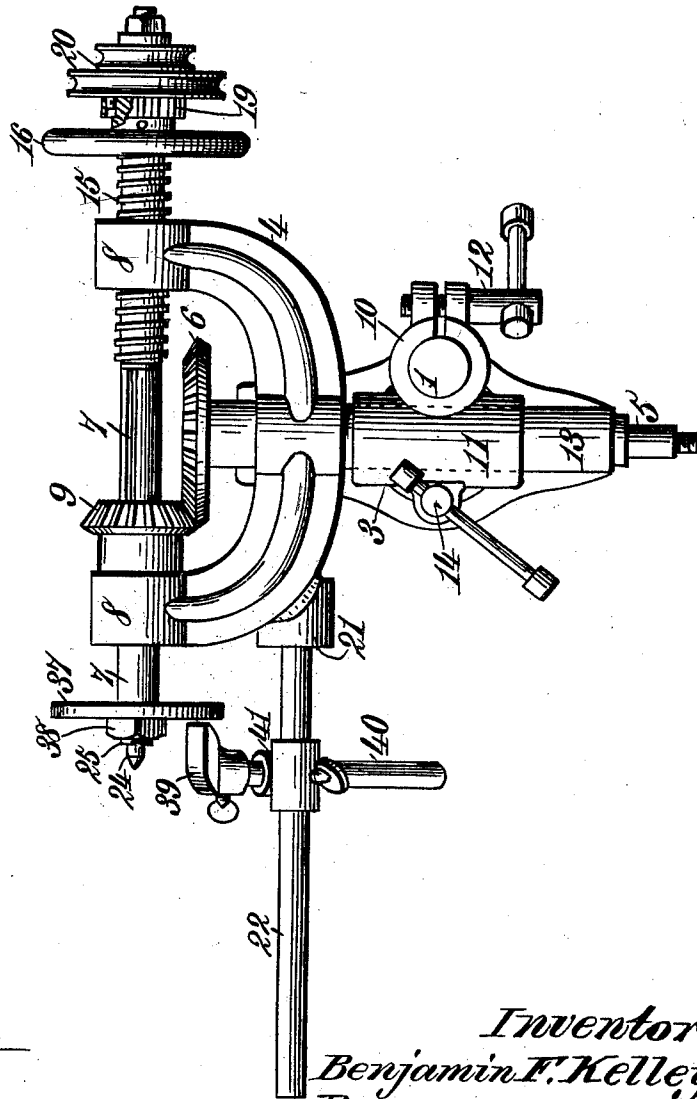
B. F. KELLEY.
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(No Model.)

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Fig. 2.



Witnesses:
Robert Quatt,
Dennis Sumbly,

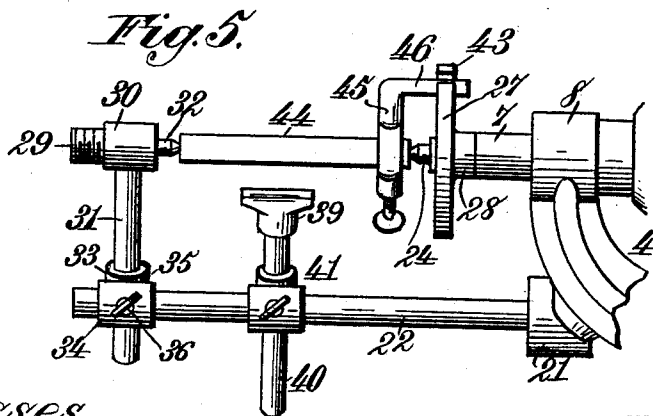
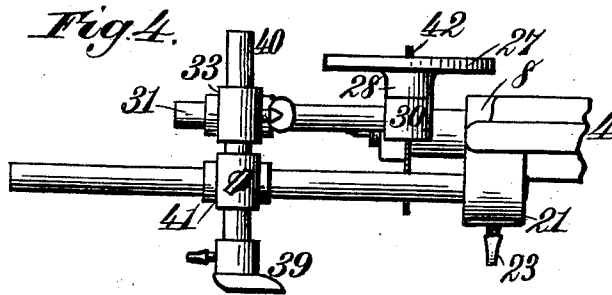
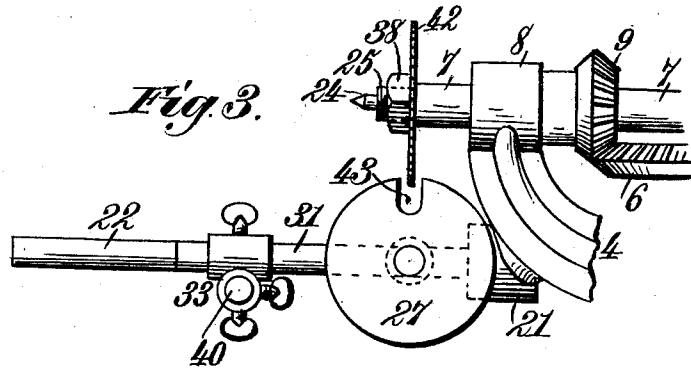
Inventor:
Benjamin F. Kelley,
By James L. Norris,
Atty.

B. F. KELLEY.
DRILLING MACHINE.

(Application filed July 25, 1901.)

(No Model.)

3 Sheets—Sheet 3.



Witnesses:
Abot Pratt.
Dennis Sumbly.

Inventor:
Benjamin F. Kelley.
 By *James L. Norris*
 Atty.

UNITED STATES PATENT OFFICE.

BENJAMIN F. KELLEY, OF FANWOOD, NEW JERSEY.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 699,535, dated May 6, 1902.

Application filed July 25, 1901. Serial No. 69,698. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. KELLEY, a citizen of the United States, residing at Fanwood, in the county of Union and State of New Jersey, have invented new and useful Improvements in Drilling-Machines, of which the following is a specification.

My invention relates to drilling-machines, the object of the same being to provide novel means whereby the drill may be removed therefrom and a number of different interchangeable tools and the cooperating parts therefor may be connected up therewith.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be set forth in the claims.

In the drawings forming part of this specification, Figure 1 is an elevation of the device shown in use with a detachable work-support for the drill. Fig. 2 is a plan view showing the device in use as a grinding-machine. Fig. 3 is a plan, and Fig. 4 is an elevation, showing the device in use as a saw. Fig. 5 is a plan view of the device in use as a lathe.

Like reference-numerals indicate like parts in the different views.

The drilling-machine consists of a standard 1, a clamp 2 for connecting the same with a table or other support, a coupling 3, vertically and horizontally adjustable upon said standard, a yoke or bracket 4, mounted in said coupling and capable of adjustment in a vertical plane thereon, a drive-shaft 5, extending through said bracket and having a gear-wheel 6 on one end, a drill-spindle 7, mounted to turn in bosses 8 on the ends of said yoke, and a pinion 9, meshing with the gear on said drive-shaft and having a spline-and-feather connection with said spindle. The clamp 2 may be of any suitable form and construction. The coupling 3 is made up of two split sleeves 10 and 11, the sleeve 10 being vertically disposed and embracing the standard 1, as clearly shown. The same may be thrown into locking engagement with said standard by means of the bolt 12, which extends through ears on said sleeve and is provided with an operating-lever, as shown. The horizontal sleeve 11 has upon the inside thereof a bearing-sleeve 13, to which it may be clamped by means of the clamping-bolt 14, extending

through ears or lugs on said sleeve 11. The bearing-sleeve 13 is secured to the central portion of the yoke or bracket 4, and the drive-shaft 5 is mounted to turn within said sleeve. The gear 6 on the end of the drive-shaft 5 is located between the branches of the yoke or bracket 4, whereas the pinion 9, which meshes with the gear 6, is provided with an axial opening, through which the spindle 7 projects. The said pinion 9 is so connected with the spindle 7 that the latter is turned by the former, but is capable of independent longitudinal movement therein. Loosely mounted upon the end of the spindle 7 opposite the pinion 9 thereon is a feeding-screw 15, the same extending through one of the bosses 8 on the yoke or bracket 4, having a screw-threaded connection therewith and engaging shoulders on said spindle, so that when the same is turned in one direction or the other it will move said spindle longitudinally. The said feeding-screw is provided with a turning-wheel 16, as clearly shown.

For rotating the spindle 7 I provide an operating crank-handle 17, having a clutch connection with the drive-shaft 5 and provided with a spring-pawl 18, adapted to cooperate with a ratchet-wheel 19 on the end of the spindle 7. By this construction it will be seen that power may be applied to the spindle 7 either through the medium of the crank-handle 17 on the end of the drive-shaft 5 or by means of said crank-handle 17, connected by means of the pawl 18 and ratchet-wheel 19, directly with the end of the spindle 7. Of course the crank-handle 17 is adapted for the operation of the spindle by hand only. If it be desired to drive the spindle 7 by other power, I may remove the handle 17 from the part to which it is connected and attach to the drive-shaft 5 or to the spindle 7 a belt-wheel 20, as shown in Fig. 2 of the drawings. The said wheel and the shaft 5 and spindle 7 are provided with cooperating clutch members for the ready attachment and detachment of said wheel.

All of the parts above described, with the exception of the belt-wheel 20 and the means of connecting the same to the drive-shaft 5 and spindle 7, are old and form no part of my present invention. My improvements consist in the means of connecting up with

the spindle 7 interchangeable tools or other analogous devices and with the bracket or yoke 4 cooperating means for said tools. To accomplish this result, I form integral with or otherwise secure to the yoke or bracket 4 a lug 21, having an opening therein in which fits a supporting-rod 22, secured in place by a set-screw 23 and extending outwardly from the yoke or bracket 4, parallel with the spindle 7. Instead of the lug 21, however, any other means of securing the rod 22 to the yoke or bracket 4 may be employed.

On the extreme end of the spindle 7 is formed a pointed projection 24, which, as will hereinafter appear, serves as the head-stock of a lathe. Also formed on the end of the spindle 7 are the screw-threads 25, provided for the attachment of the different devices to said spindle. When the apparatus is used for drilling, the drill-chuck 26, carrying a drill 26^a, is screwed upon the end of the spindle 7, the said chuck being provided with internal screw-threads to receive the screw-threads 25. In connection with these parts I may employ a disk 27, having a central internally-screw-threaded boss 28 thereon, designed to receive a screw-threaded projection 29 on a block 30, secured to and extending at right angles to a rod 31. The said block 30 is provided on the end thereof opposite the screw-threaded projection 29 with a pointed projection 32, constituting, as will hereinafter appear, the tail-stock of a lathe. On the rod 31 is a coupling-piece 33, comprising two sleeves 34 35, set at right angles to each other and provided with set-screw 36. The disk 27 is screwed upon the projection 29, the rod 31 is adjusted in the sleeve 34 on the coupling-piece 33, and the sleeve 35 on said coupling-piece is placed upon the supporting-rod 22, and said disk may then be adjusted in a plane at right angles to the spindle 7 at any proper point with respect to the end of the drill. When in this position, said disk serves as a work-support for the material operated upon by the drill.

When it is desired to use the device as a means for sharpening tools, the drill-chuck 26 is removed from the end of the spindle 7 and there is substituted therefor an emery-wheel or other grinding-disk 37, the same being provided with a central aperture, through which the threaded portion 25 of the spindle 7 projects, the said emery-wheel being locked in place upon said spindle by means of a nut 38, screwing upon the threads 25 and forcing the said emery wheel or disk into locking engagement with a shoulder on the spindle 7. When the emery-wheel 37 is thus secured to the spindle 7, I mount upon the supporting-rod 22 a tool-rest 39, the said tool-rest being adjustably secured upon one end of a rod 40, carrying a coupling-piece 41, similar in all respects to the coupling-piece 33, heretofore described. Said rod 40 is adjustable in one of the sleeves of the coupling-piece 41, and the other sleeve of said coupling-piece is ad-

justable upon the supporting-rod 22, so that the tool-rest 39 may be located in proper position with respect to the surface of the emery-wheel 37.

In lieu of the emery-wheel or grinding-disk 37 on the end of the spindle 7 I may connect with said spindle a circular saw 42, the same having a central opening therein, through which the end of said spindle projects, and being secured in place by means of the nut 38. When the saw is used, the disk 27, as a support for the work, is brought into play. The said disk 27 is provided with a slot 43 in its periphery, through which the edge of the saw 42 projects. The boss 28 on the disk 27 is screwed onto the block 30 on the end of the rod 31, and the coupling-piece 33 on said rod 31 is connected with the rod 40. The latter rod, by means of the coupling-piece 41 thereon, is secured upon the supporting-rod 22 and located in a substantially vertical position. The disk 27 when thus connected up with respect to the saw 42 is disposed in such position as to support the work on which the saw operates and to provide for the feeding movement thereof toward the saw.

To use the device as a lathe, the disk 27 is screwed up upon the end of the spindle 7, the screw-threads 25 on said spindle meshing with the internal screw-threads on the boss 28 on said disk. When in this position, the said disk serves as the lathe-head and the pointed projection 24 on the end of the spindle 7 serves as the head-stock. The rod 31, which carries the block 30, is connected up with the supporting-rod 22 by means of the coupling-piece 33, with the pointed projection 32 on said block lying in line with and extending toward the pointed projection 24. Said projection 32 is adjustable toward and from the head-stock 24 and serves as the tail-stock of the lathe. The bar 44 or other device to be turned is seated, as usual, between the head-stock 24 and the tail-stock 32 and is operatively connected with the disk 27, which constitutes the head, by means of the lathe-dog 45. The said dog may be of any usual or preferred form of construction, the lateral flange or arm 46 thereon fitting within the slot 43 in the disk 27. The tool-rest 39 is adjusted upon the supporting-rod 22 by means of the coupling-piece 41 in the manner shown.

From the foregoing description it will be understood that when the device is to be used as a drill, as a grinding-machine, as a saw, or as a lathe the spindle 7, which carries these different devices, may be rotated by the application of hand-power applied to the crank 17 upon either the drive-shaft 5 or the spindle 7, or said spindle may be rotated by means of power derived from any source and applied by means of the belt-wheel 20 on the end of the drive-shaft 5 or on the end of said spindle. The cooperating devices for the different tools are mounted upon the supporting-rod 22, and the machine as a whole may be

adjusted up or down on the standard 1, or
 may be turned on said standard in a horizon-
 tal plane, or may be adjusted by turning the
 yoke or bracket 4 in the horizontal sleeve 11,
 5 so that the operative devices will stand either
 vertically, horizontally, or at any angle be-
 tween these two positions.

Having now described my invention, what
 I claim as new, and desire to secure by Letters
 10 Patent, is—

1. The combination with the standard or
 support of a drilling-machine, a yoke or
 bracket adjustable thereon and a rotary spin-
 dle mounted in said bracket, of means for
 15 connecting up various interchangeable tools
 with said spindle, a support on said yoke or
 bracket for various interchangeable coöper-
 ating devices for said tools, and coupling de-
 vices for connecting said coöperating devices
 20 to said support.

2. The combination with the standard or
 support of a drilling-machine, a yoke or
 bracket adjustable thereon and a rotary spin-
 dle mounted in said bracket, of means for
 25 connecting up various interchangeable tools
 with said spindle, a supporting-rod secured
 to said yoke or bracket for sustaining various
 interchangeable coöperating devices for said
 tools, and coupling devices for connecting
 30 said coöperating devices to said rod.

3. The combination with the standard or
 support of a drilling-machine, a yoke or
 bracket adjustable thereon and provided with
 a lug, and a rotary spindle mounted in said
 bracket, of means for connecting up various
 35 interchangeable tools with said spindle, a sup-
 porting-rod removably secured in said lug,
 and means for connecting up various coöper-
 ating devices for said tools to said support-
 ing-rod.

4. The combination with the frame of a
 drilling-machine having a lug thereon, and a
 rotary spindle having screw-threads thereon
 for the attachment of a drill-chuck and a
 shoulder adjacent to said screw-threads, of a
 45 grinding-wheel having a central opening
 therein designed to receive the screw-thread-
 ed end of said spindle, a nut for holding said
 grinding-wheel into locking engagement with
 said shoulder, a supporting-rod secured in
 50 said lug, and a tool-rest adjustably secured
 to said supporting-rod.

In testimony whereof I have hereunto set
 my hand in presence of two subscribing wit-
 nesses.

BENJAMIN F. KELLEY.

Witnesses:

OLOF S. PEDERSEN,
 GEO. MCDOWELL.