

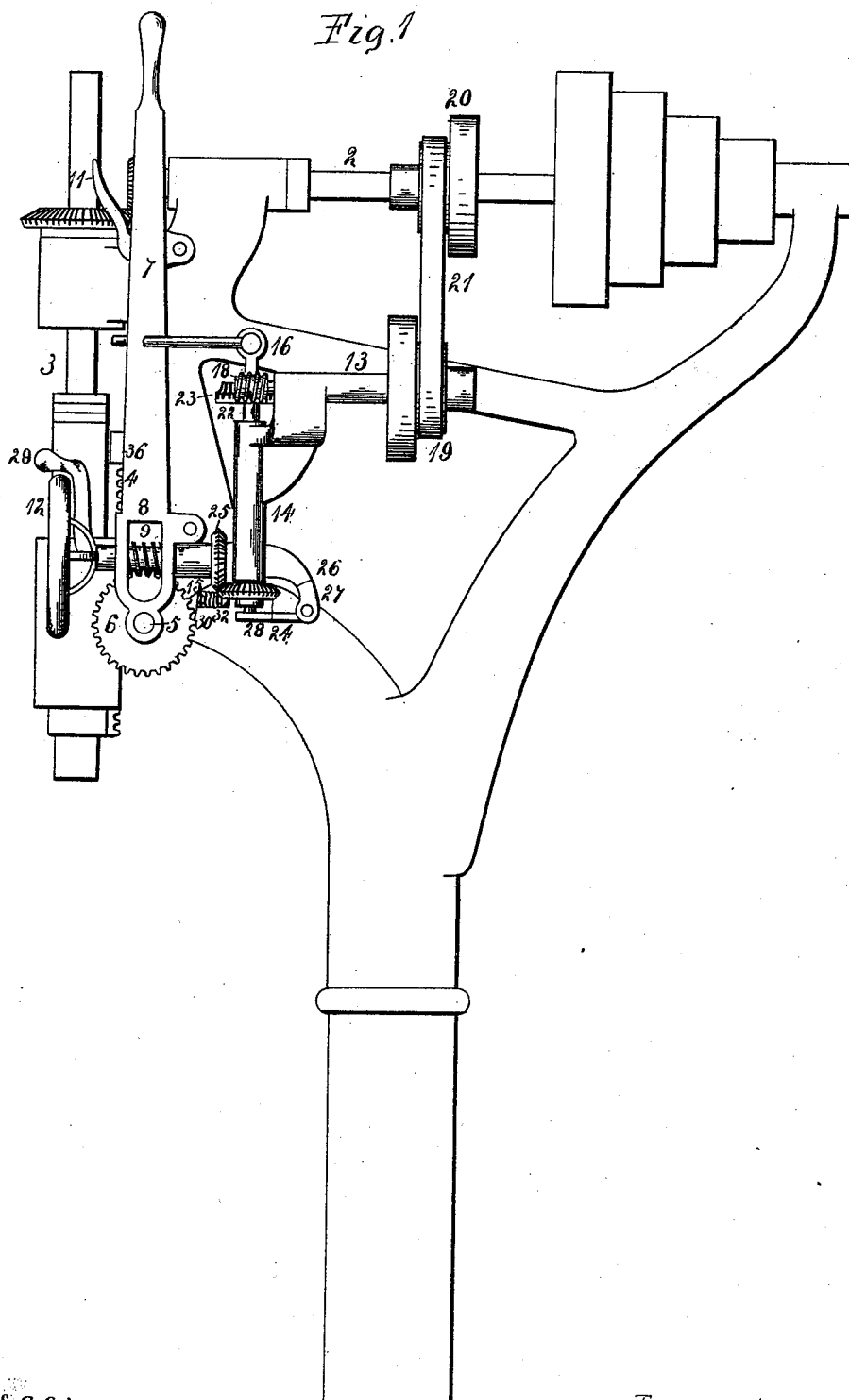
(No Model.)

3 Sheets—Sheet 1.

W. F. BARNES.
DRILLING MACHINE.

No. 516,150.

Patented Mar. 6, 1894.



Witnesses:
S. A. Davenport.
E. C. Behel.

Inventor:
William F. Barnes
By A. C. Behel
Att.

(No Model.)

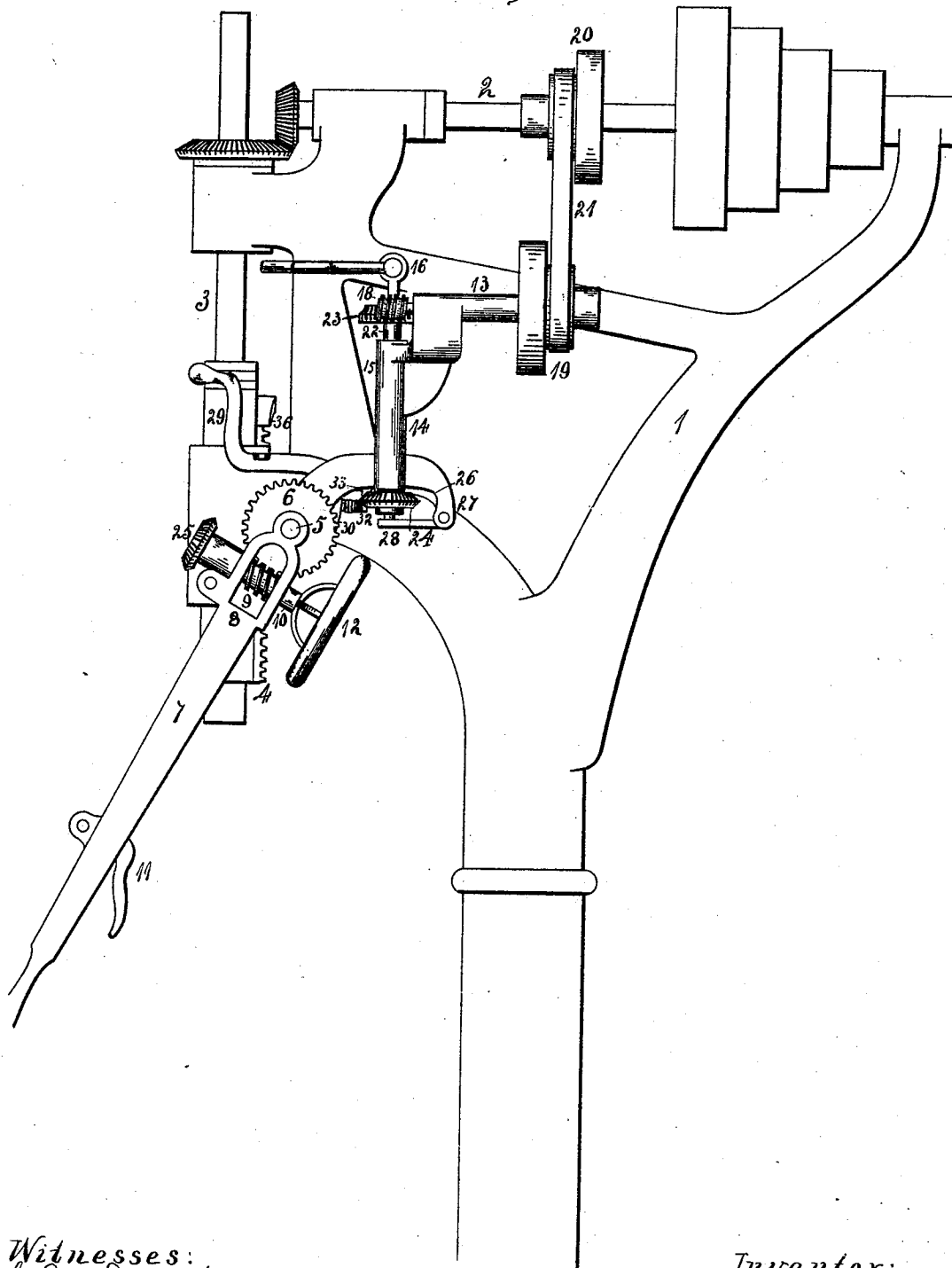
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Fig. 2



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(No Model.)

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Fig. 3.

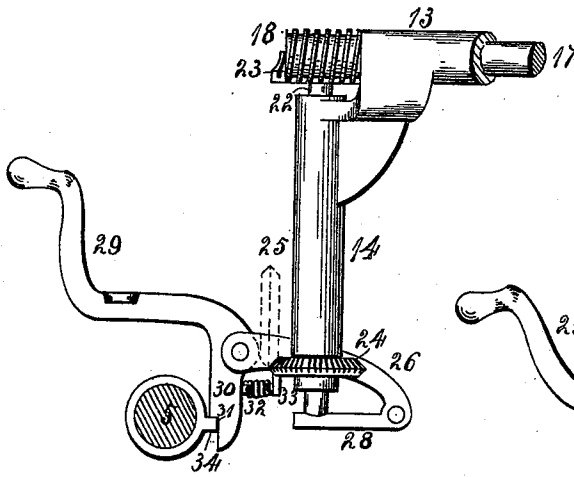


Fig. 4.

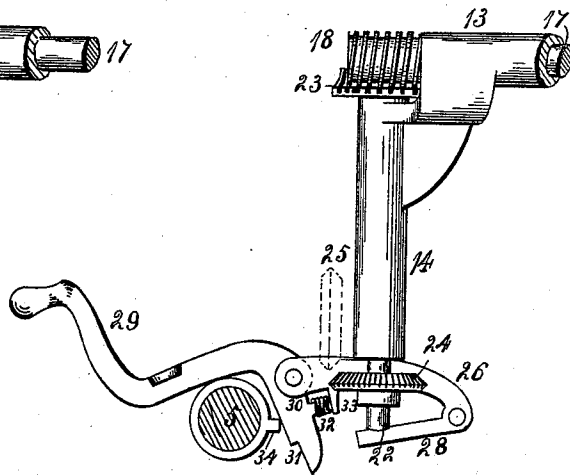


Fig. 5.

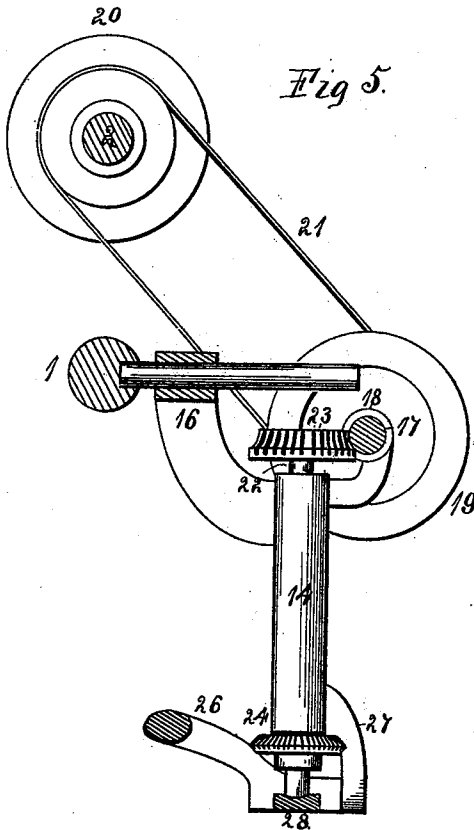
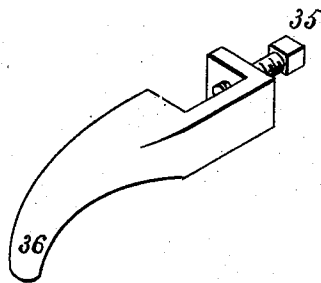


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM F. BARNES, OF ROCKFORD, ILLINOIS, ASSIGNOR TO THE W. F. & JOHN BARNES COMPANY, OF SAME PLACE.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 516,150, dated March 6, 1894.

Application filed December 7, 1893. Serial No. 493,054. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. BARNES, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Drilling-Machines, of which the following is a specification.

The object of this invention is to form a connection between the driving power and the feed through the spindle having a connection with the rack of the drill spindle in such a manner as not to interfere with the spindle being operated by hand.

The further object of my invention is to automatically stop the feed of the drill by disconnecting the parts forming a connection between the driving power and the drill spindle.

In the accompanying drawings, Figure 1, is a side elevation of a drilling machine in which the feed has a connection with the driving power. Fig. 2, is a side elevation in which the feed is operated by hand. Figs. 3, 4, 5, and 6 are detached views of the parts for automatically stopping the feeding of the drill.

The drilling machine represented in the drawings consists of the main frame 1, supporting a driving shaft 2, in its upper portion and drill spindle 3, in its front portion, said driving shaft and drill spindle having a rotative connection, said parts being of a well-known construction and are herein shown in order that my improvements may be better understood. The drill spindle is provided with the usual toothed rack 4, which meshes with a pinion connected to the horizontal shaft 5, by means of which the spindle is raised or lowered during the process of drilling and it is with this shaft that my improvements have a connection.

In Letters Patent No. 270,537, dated January 9, 1883, is shown and claimed the construction of the lever for operating the feed shown in this application consisting of a screw gear 6, mounted on the end of the shaft 5, the lever 7, provided with a slotted end 8, within which is received the screw gear wheel, this end of the lever being mounted upon the shaft which acts as its pivot. A worm 9, meshes with the teeth of this screw gear and is located upon a shaft 10, supported in bearings in the lever proper, said shaft having a

pivotal connection with the lever. A thumb lever 11, has a connection with the shaft 10, by means of which the worm is raised out of mesh with the screw gear. This form of connection as thus far described acts as a ratchet wheel and pawl by means of which the shaft may be rotated in every direction to raise or lower the drill spindle.

To the end of the shaft 10, upon which the worm 9, is mounted is secured a hand wheel 12, by means of which the screw gear may be rotated in every direction thereby raising or lowering the drill spindle; to such construction no claim is laid in this application.

A horizontal bearing 13, and vertical bearing 14 are supported by an arm 15, surrounding a bushing within which is located the shaft 5, and an arm 16 connected with the main frame of the machine.

In the horizontal bearing 13, is located a shaft 17 upon one end of which is secured a worm 18, and upon its other end is secured a cone pulley 19. This cone pulley has a connection with the cone pulley 20, mounted on the driving shaft 2, by a belt 21.

In the vertical bearing 14, is located a shaft 22, upon the upper end of which is secured a screw gear 23, and to its lower end is secured a miter gear wheel 24, this miter gear wheel meshes with a miter gear wheel 25, secured to the end of the shaft 10, carrying the worm 9. By this arrangement a connection is formed between the driving shaft and drill spindle through the medium of cone pulleys 19 and 20 belt 21, worm 18 screw gear 23, miter gear wheels 24 and 25, worm 9, screw gear 6, and horizontal shaft 5, so that the rotary movement of the driving shaft will impart a reciprocating movement to the drill spindle and such arrangement will not interfere with the spindle, being operated by the hand lever, as in the oscillatory movement of the lever the miter gear wheels will unmesh. Owing to the teeth of these miter gear wheels being rounded they will readily mesh while the miter tooth wheel 24, is in motion. This vertical shaft 22 has a lengthwise movement in its bearing, in order that the miter gear wheel 24, may drop, thereby becoming disengaged from the miter gear wheel 25, in order that the automatic feed of the drill spindle

may be stopped when it is desirable to operate the feed by means of the hand wheel 12. This shaft is held in its uppermost position by linked connection with a stationary part 5 of the machine. This linked connection consists of an arm 26, having a pivotal connection with an arm 27, extending from the lower end of the bearing 14 and has an extension 28 upon which the lower end of the shaft 22 rests. 10 The outer end of this arm 26 has a pivotal connection with an arm 29, the free end of which is in handle form, the end of this arm near its pivotal connection with the arm 26, has a downward extension 30, the front face side of 15 which is provided with a notch 31 and a spring 32 bearing against this extension and an extension 33 from the arm 26. A projection 34, extends from the rear face of a boss. By means of this linked connection the miter 20 gear wheels are held in an engagement, while the notch 31 of the extension 30 rests upon the projection 34, and the arm 28 will be located as shown in Fig. 3, and by pressing upon the handle portion of the arm 29 the extension 30 will become disengaged from the pro- 25 jection 34, allowing the arm 28 to descend; also allowing the miter gear wheel 24 to descend out of mesh with the miter gear wheel 25, thereby cutting off the feed connection between the driving shaft and drill spindle as 30 shown in Fig. 4. In the descending movement of the shaft 22, the screw gear 23 will remain in mesh with the worm 18 and continue to revolve.

35 In order that the feed connection between the driving shaft and drill spindle may be automatically broken, I have formed a trip,

shown at Fig. 6, consisting of a clamp held in place by a set screw 35 and having a downward extending end 36. This trip is adjustable the proper distance along the tooth rack 40 4, of a drill spindle and clamped in position, and when in position its downward extending end will override the arm 29 near its free end, and as the drill spindle descends this trip 45 will come in contact with the arm 29, depressing it, causing it to release its hold upon the projection 34, thereby allowing the descent of the miter gear wheel 24, causing a breakage in the feed connection between the driving 50 shaft and drill spindle.

I claim as my invention—

1. The combination of a worm, a hand lever in which the worm is mounted, a worm wheel in engagement with the worm, and means 55 whereby the worm may be connected with the driving power of the drill.

2. The combination of a worm, a hand lever in which the worm is mounted and is capable of use as a pawl to engage the worm wheel, a 60 gear mounted on the end of the worm shaft, and means whereby said gear may be made to mesh with a gear having a connection with the driving power of the drill.

3. The combination of a worm, a hand lever 65 in which the worm is mounted and capable of use as a pawl to engage a worm wheel, a connection between the worm and driving power of the drill, and means for automatically breaking such connection.

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