

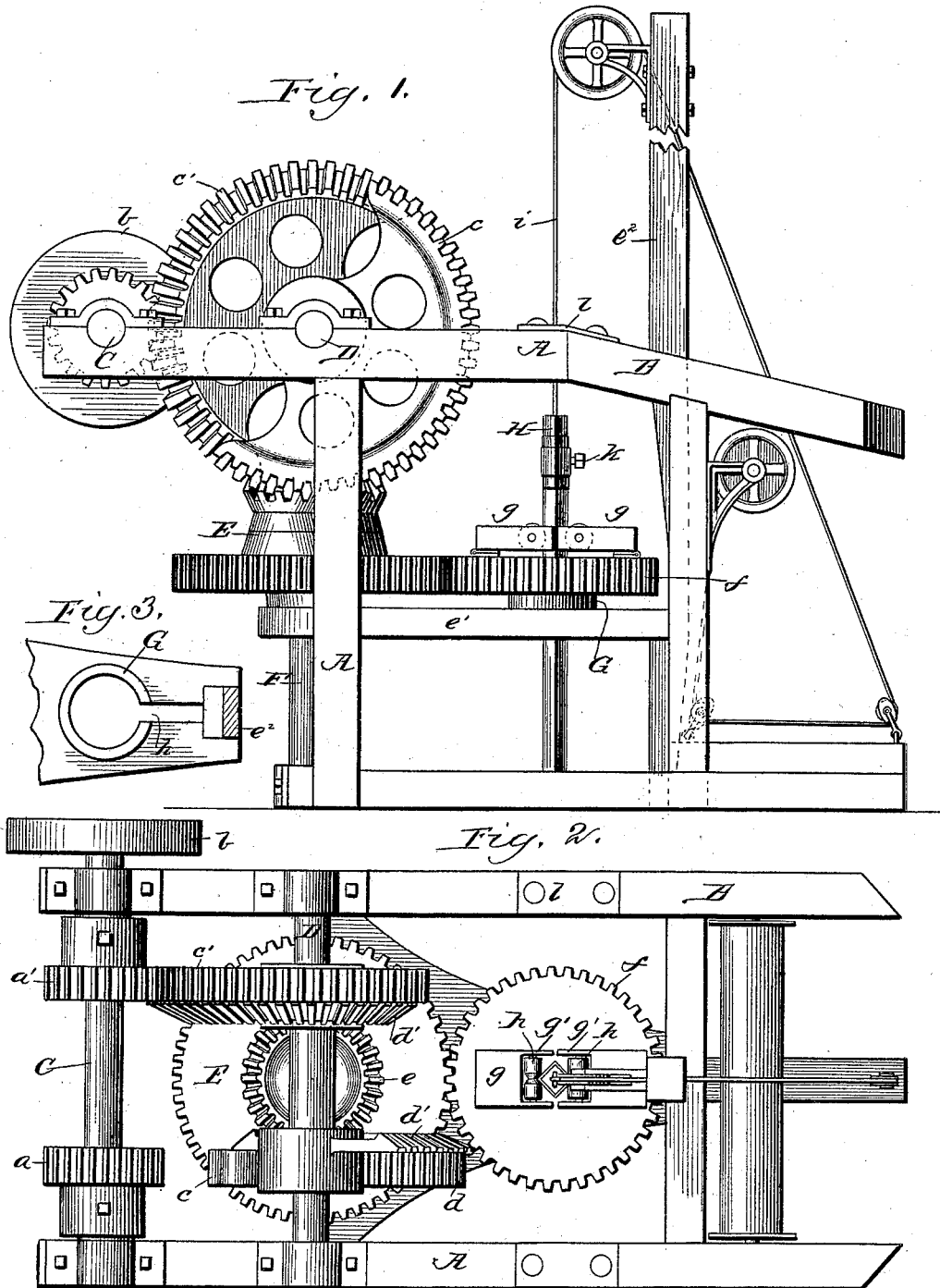
(No Model.)

W. T. NANCE.

SELF TURNING WELL DRILL ATTACHMENT.

No. 423,387.

Patented Mar. 11, 1890.



Witnesses

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# UNITED STATES PATENT OFFICE.

WILLIAM T. NANCE, OF FALL CREEK, TENNESSEE.

## SELF-TURNING WELL-DRILL ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 423,387, dated March 11, 1890.

Application filed September 9, 1889. Serial No. 323,435. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM T. NANCE, a citizen of the United States, residing at Fall Creek, in the county of Bedford and State of Tennessee, have invented certain new and useful Improvements in Self-Turning Well-Drill Attachments, of which the following is a specification.

My invention relates to improvements in an attachment for well drilling or digging machines, and is especially adapted to that class of machines for this purpose in which the drilling or digging is done by the gravity or continually dropping of a drill which is secured to one end of a rope, the other end or portion being wound on a drum which raises and drops the drill at suitable intervals by means of the ordinary tripping mechanism employed in such machines; and it consists in certain peculiarities of the construction of the same and in the novel arrangement of the different parts thereof, as will be hereinafter more fully set forth and specifically claimed.

In the ordinary drilling-machines above referred to, and to which my invention is applicable, it is necessary to change the lateral position of the drill frequently to facilitate drilling and to prevent the drill becoming fastened, and to accomplish this effectually and automatically is one of the main objects of my invention.

Another object of my improvement is to guide the rope so that the drill will be kept in the center of the hole at all times and a much straighter hole drilled than by the methods now in use.

In order to enable others skilled in the art to which my invention pertains to make and use the same, I will now proceed to describe it, referring to the accompanying drawings, in which—

Figure 1 is a view in side elevation showing a portion of a drilling-machine with my device attached. Fig. 2 is a plan view of the same, and Fig. 3 is a detail plan view of a portion of an arm of my device and the split shaft.

Similar letters refer to like parts throughout the drawings.

A represents the main or supporting frame of my attachment, made of suitable size, form,

and material, and is removably secured to the front portion of the drilling-machine B by means of bolts or otherwise. On the upper surface of this frame and near the rear end thereof is mounted in suitable bearings a driving-shaft C, having rigidly secured thereon, within the frame and near each end of the shaft, two small cogged gears *a a'*, which mesh and engage with other gears, as will be presently explained.

On one end of the shaft C and outside of the frame is rigidly secured a pulley *b*, to which is applied the power for operation by means of a belt passing over a pulley on the main shaft of the drilling-machine.

At a suitable distance from the shaft C and in front thereof I journal on the frame A the shaft D, which shaft has mounted and rigidly secured thereon within the frame and at the proper points on the shaft to engage with the gears *a a'* two segment gear-wheels *c c'*, semicircular in form and having their peripheries provided with spur-cogs *d* to engage with similar cogs on the gears *a a'*, as is seen in the drawings.

On the inner surface of each of the gears *c c'*, I provide a beveled gear *d'* to engage with a beveled gear *e* on the gear-wheel E, which is mounted on the upper end of a vertical shaft F, which is placed and journaled in the lower portion of the frame A, directly beneath the center of the shaft D, at a proper distance for the beveled gears *d'* and *e* to engage each other, as is seen in Fig. 1 of the drawings.

On an arm *e'* of the frame A, which arm is bifurcated at its end to be secured to the rope-supporting standard *e<sup>2</sup>* of the drilling-machine, I journal on a split and hollow shaft G, on which a cogged gear *f* is mounted, which gear is provided on its upper surface with two hinged brackets *g g*, each bracket having its free end formed with a fork, as at *g'*, and having loosely journaled within said forks a small roller *h h*, which rollers are free to revolve either in an upward or downward direction, as is apparent.

It will be seen from the drawings that the brackets carrying the rollers are hinged at their outer ends to the upper surface of the gear *f*, near its periphery, and that their free ends, to which the rollers are secured, almost

meet in the center of the gear *f* and directly over the hollow shaft *G*, which extends through and is flush with the top of said gear. The shaft *G* is made hollow and of sufficient size to permit the free passage of the rope and clamp in their upward and downward movements through the same. I also form this shaft with a split or longitudinal slot *h'*, of sufficient size to permit the withdrawal of the rope in the event I may wish to detach my device from the machine.

It is a rope-clamp made of two pieces of proper length, between which the rope *I* is placed and secured by means of an ordinary clasp and set-screw *k*, which is located near the top of the clamp, as shown in Fig. 1, so that the clamp may be easily adjusted as the drilling progresses.

In Fig. 3 of the drawings I have shown in detail a plan view of a portion of the arm *e'*, with the hollow shaft *G* in place and with the gear *f* removed. From this view it will be seen and readily understood that if at any time the drill should become fastened in the hole and it was necessary to remove my attachment it could be easily done by raising the gear *f* from off the shaft *G* and allowing the rope to pass through the slot *h'* and the bifurcated end of the arm *e'*, when the detachment is effected with the exception of the gear *f*, which would still remain on the rope; but as it is small and light it would not interfere with unfastening the drill.

It will be seen in the drawings that the segment-gears *c c'*, having inwardly-beveled gears *d'*, are in form semicircular and that they are mounted on the shaft *D*, one near each end thereof, in such a manner that when the gear *a'* is engaged with the gear *c'* the beveled gear *d'* on gear *c* will be in engagement with the beveled gear *e* on large gear *E*, and that as soon as gear *a'* is disengaged with gear *c'* it (gear *a'*) will engage, by means of its beveled gear *d'*, with the gear *e* and reverse the movement of gear *E*, as well as that of gear *f*, which imparts its motion to the drill.

I have shown a portion only of the drilling-machine. As my invention relates to the attachment, an illustration of more of the machine is unnecessary.

The operation of my device is simple and

as follows: The attachment is secured to the front part of the machine, as shown at *l l*, and the rope is placed in the clamp *H* and secured therein by the set-screw and clasp, when the drill may be passed through the hollow shaft *G* into the hole below. The clamp is then placed between the rollers *h h*, which will press against either side of the clamp and prevent it turning, yet will allow it to rise or fall without restriction. The power is then applied to the device by means of a belt on the pulley *b*, which will rotate the driving-shaft, and through the gearing, as described above, automatically turn the drill in one direction for several strokes and then reverse its motion.

What I claim is—

1. In an attachment for drilling-machines, the combination of the main frame *A*, having the bifurcated arm *e'*, with the driving-shaft *C*, having the cogged gears *a a'* and pulley *b* mounted thereon, the shaft *D*, having the segmental gears *c c'*, with segmental beveled gears *d'* mounted thereon, the vertical shaft *F*, having the gears *E* and *e* mounted thereon, the gear *E*, engaging with gear *f*, mounted on shaft *G* and having brackets *g g* provided with rollers *h h*, and the clamp *H*, having set-screw and clasp *k*, all constructed, arranged, and operating substantially as shown and described, and for the purpose set forth.

2. The combination of a drilling-machine and an attachment consisting of the supporting-frame *A*, having the bifurcated arm *e*, the driving-shaft *C*, having mounted thereon the cogged gears *a a'* and pulley *b*, the shaft *D*, having the segmental gears *c c'*, with segmental beveled gears *d'* mounted thereon, the vertical shaft *F*, having the gear *E* and beveled gear *e* mounted thereon, the gear *E*, engaging with gear *f*, mounted on the shaft *G* and having brackets *g g* hinged thereto and provided with rollers *h h*, and the hollow split shaft *G*, all constructed, arranged, and operating substantially as set forth.

In witness whereof I have hereunto set my hand and affixed my seal this 27th day of August, 1889.

WILLIAM T. NANCE. [L. S.]

In presence of—

B. M. TILLMAN,  
S. S. WARREN.