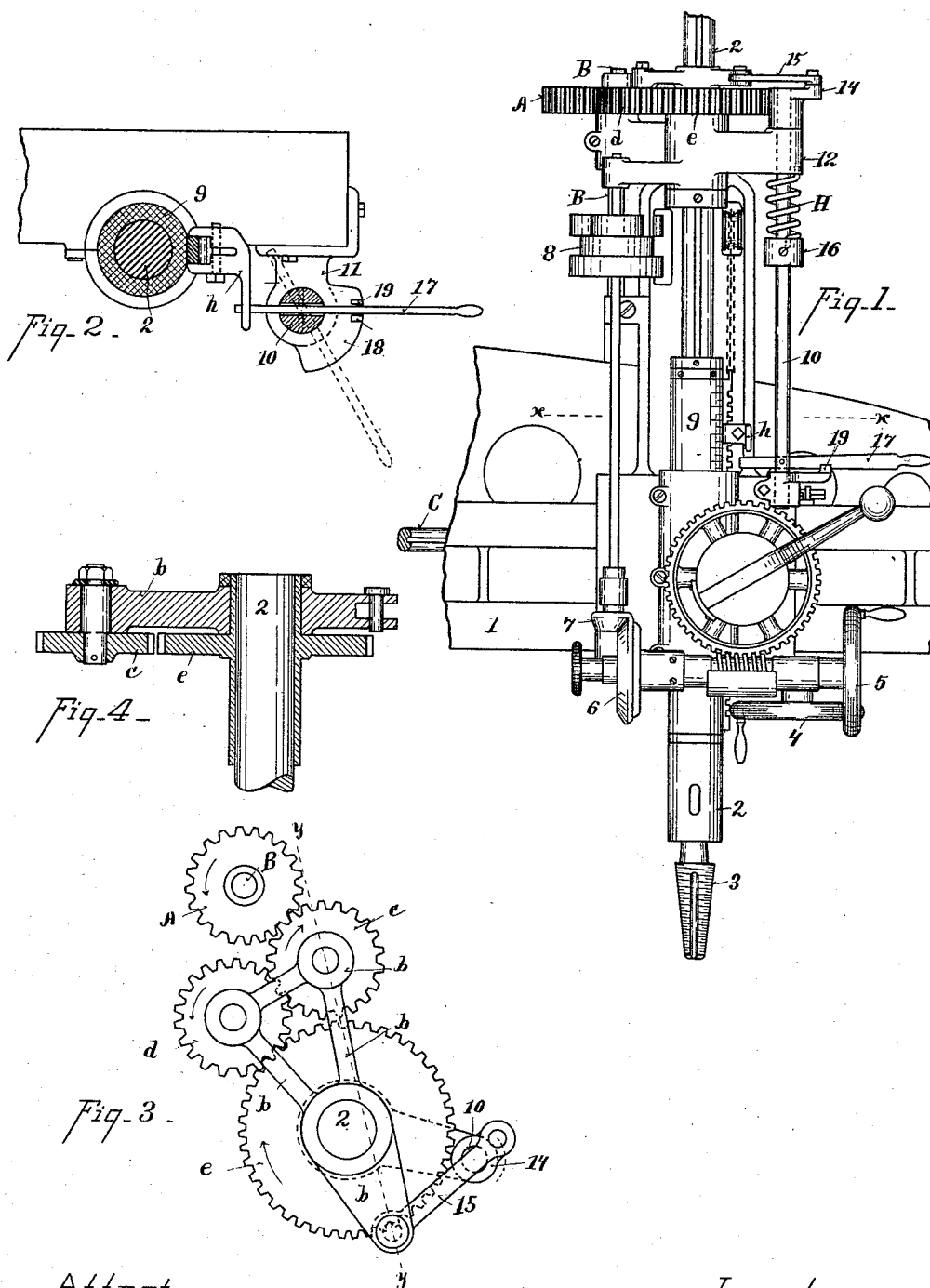


(No Model.)

A. MILL.
TAPPING ATTACHMENT FOR DRILLS.

No. 489,317.

Patented Jan. 3, 1893.



Attest
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[Signature]

Inventor
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UNITED STATES PATENT OFFICE.

ANTON MILL, OF CINCINNATI, OHIO.

TAPPING ATTACHMENT FOR DRILLS.

SPECIFICATION forming part of Letters Patent No. 489,317, dated January 3, 1893.

Application filed June 6, 1892. Serial No. 435,751. (No model.)

To all whom it may concern:

Be it known that I, ANTON MILL, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Tapping Attachments for Drills, of which the following is a specification.

The object of my invention is to provide a tapping attachment to be used on an ordinary drill spindle, combined with mechanism for rotating the drill spindle and an appliance for automatically reversing the motion of the drill spindle when the hole or nut has been tapped the requisite depth.

The various features of my invention are fully set forth in the description of the accompanying drawings making a part of this specification, in which—

Figure 1 is an elevation of my improvement. Fig. 2 is a section on line *x, x*, Fig. 1. Fig. 3 is a top plan view of the driving gear. Fig. 4 is a section on line *y, y*, Fig. 3.

In the accompanying drawings I have shown my attachment as mounted upon the swiveling arm 1 of a radial drill. 2 represents the drill spindle. 3 a tap for cutting the threads to bolt holes or nuts. 4, 5, represent the ordinary hand wheel feeds. 6, 7, 8, represent transmitters for effecting the vertical feed. These parts are of the ordinary construction.

The following are my improvements placed upon the same:

A represents the driving gear on the top of shaft B, which receives its motion by beveled gears from the shaft C in the usual manner. *b* is a tumbler plate journaled thereon. On the forward end of this plate are mounted transmitters *c, d*. When the parts are in position shown in Fig. 3 motion is transmitted from the gear A to the gear *c*, thence to the gear *d*, to gear *e*, on the drill spindle 2. For reversing the motion the tumbler plate *b* is rotated upon its journal, throwing the transmitter *c* out of engagement with gear A, and bringing the gear *d* into engagement with gear A, transmitting direct from gear A to gear *d*. In order to accomplish this automatically in any predetermined time I have provided the following instrumentalities:

h represents a trip secured to the vertically moving sleeve 9, and rising and falling with the drill spindle.

10 represents a shaft journaled in the bracket 11 and ear 12, and carrying the crank arm 14.

15 represents a link connecting the crank 14, to the outer end of the tumbler plate *b*.

H represents a torsional spring, one end of which is secured in ear 12, and the other in the collar 16.

17 represents a lever pivoted in the mortise pierced through the shaft 10.

18 represents a plate carrying lugs 19 between which the lever 17 is held in a set position. The spring is strained by moving the lever 17 into this position. When the trip *h* strikes the outer end of lever 17 it forces it down and raises the opposite end of the lever out of engagement with the lugs 19, and the torsional spring H turns the shaft 10 and brings the lever into position shown in dotted lines, Fig. 2. This turning of the shaft 10 throws the gear *c* out of engagement with gear A and brings the gear *d* into engagement therewith through the operation of the crank 14, and link 15, thereby changing the gear so as to reverse the motion of the spindle *a*, turning the tap 3 backward. When this has been raised a sufficient distance the lever 17 is carried around and brought into position and locked ready for a second operation.

Having described my invention what I claim is—

In combination with the drill spindle 2, a driven gear *e*, the interchangeable gears *d, c*, mounted upon the tumbler plate *b*, the torsion shaft 10, crank and link 14, 15 setting lever 17, and trip *h*, all combined with the head stock, substantially as specified.

In testimony whereof I have hereunto set my hand.

ANTON MILL.

Witnesses:

T. SIMMONS,
C. W. MILES.