

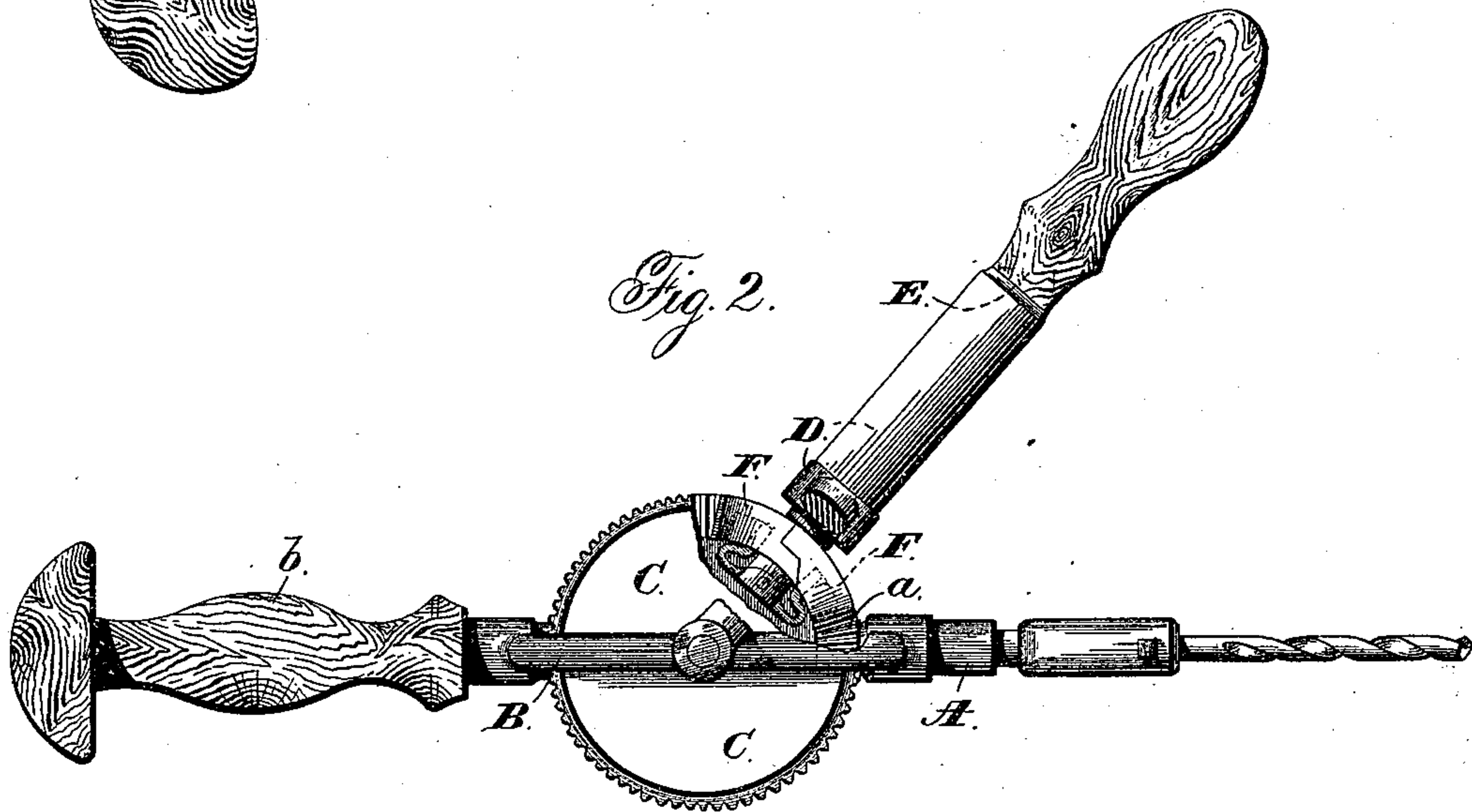
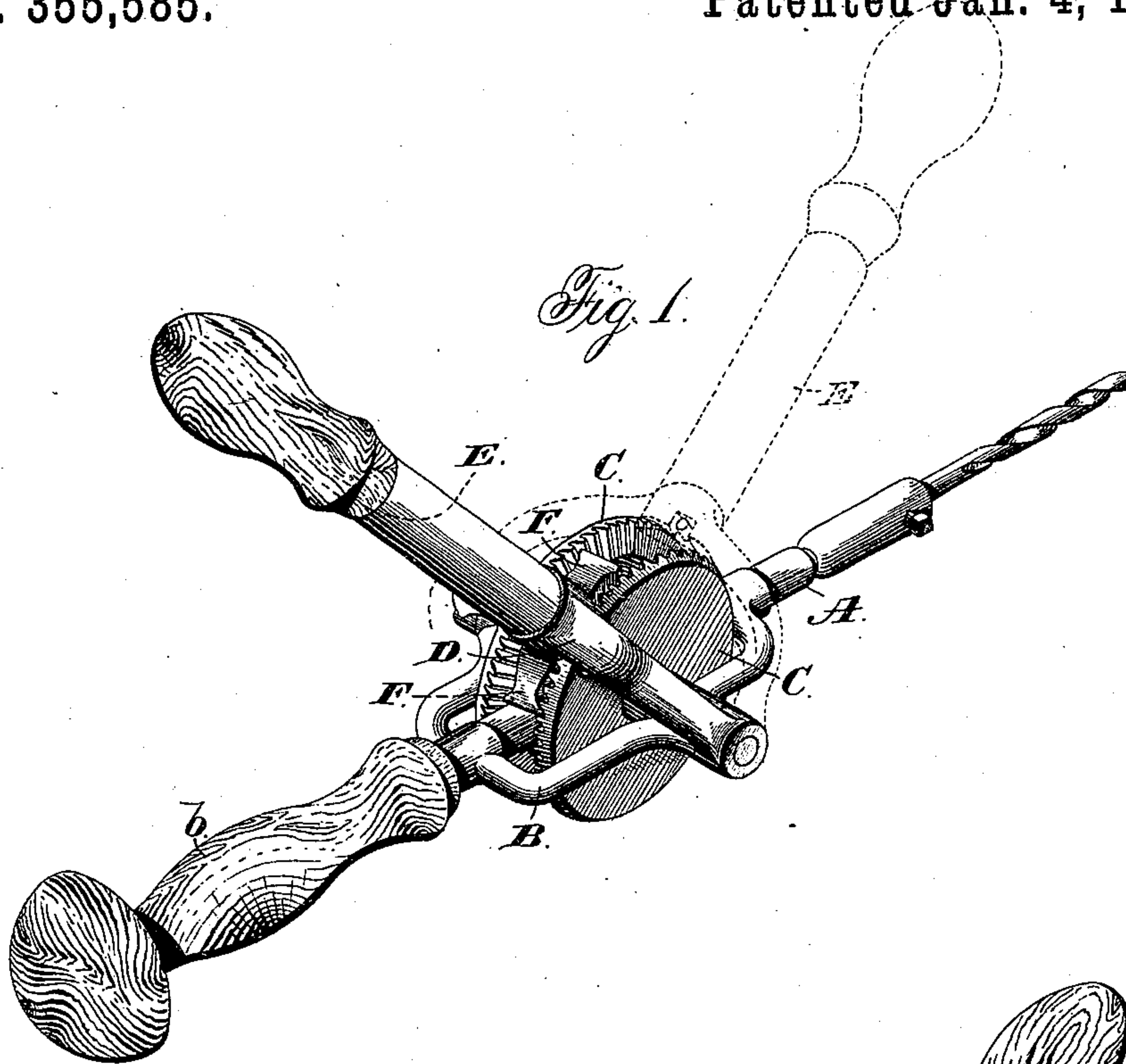
(No Model.)

2 Sheets—Sheet 1.

D. A. A. & A. A. BUCK.  
HAND DRILL.

No. 355,585.

Patented Jan. 4, 1887.



*Witnesses:*  
*Jas. E. Hutchinson.*  
*Henry C. Hazard.*

*Inventors:*  
*A. A. and D. A. A. Buck, by*  
*Prindle & Russell, their Attys.*

(No Model.)

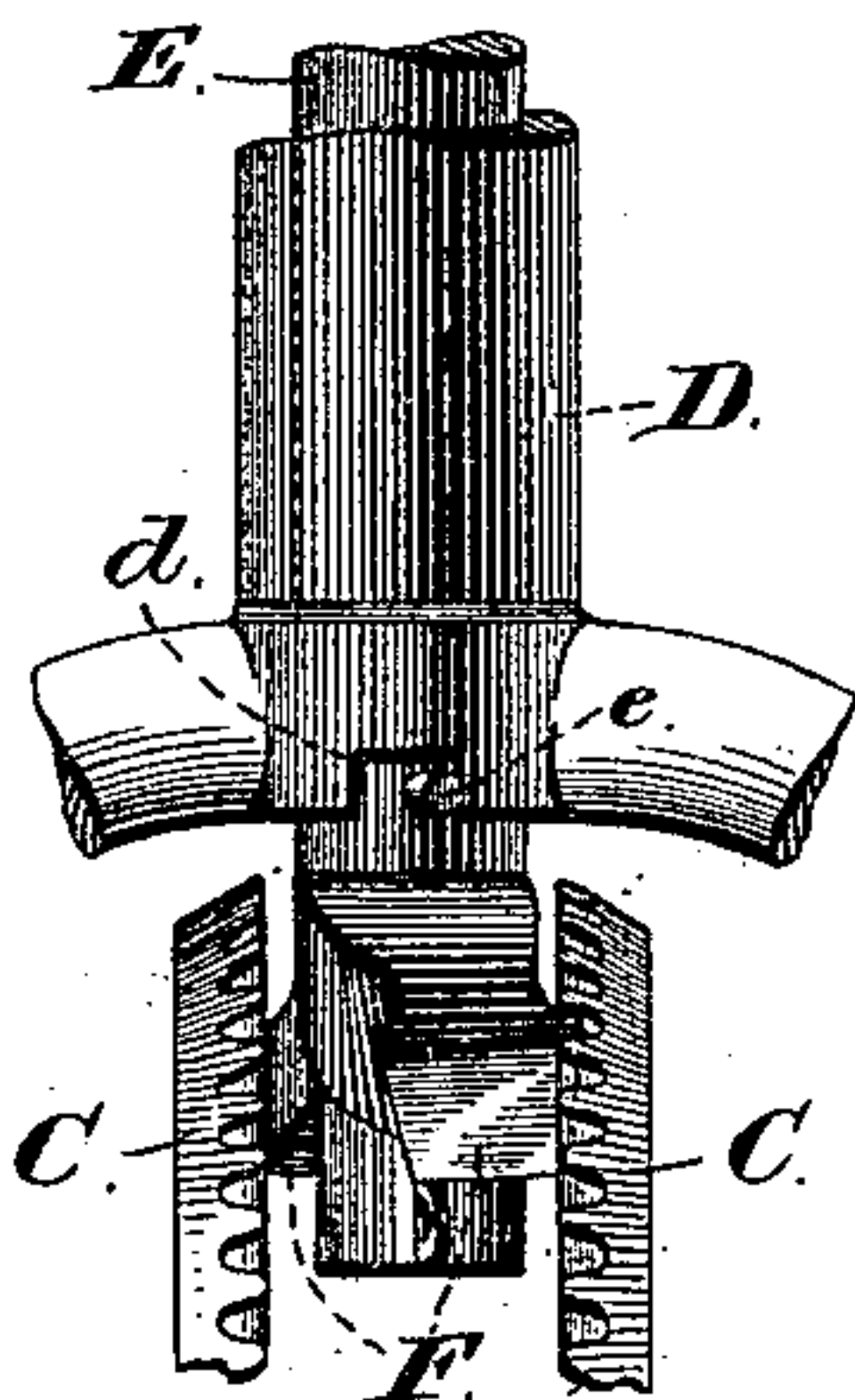
2 Sheets—Sheet 2.

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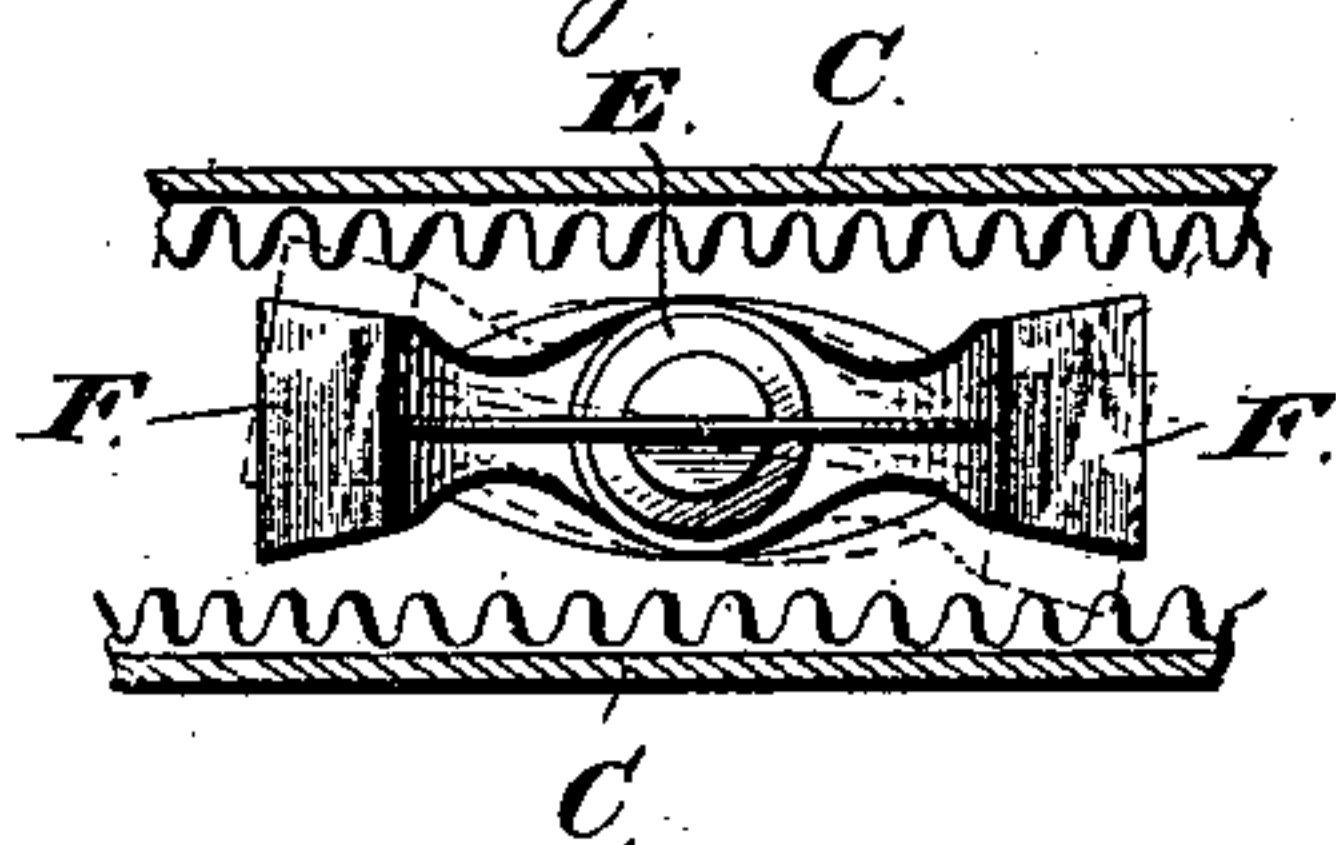
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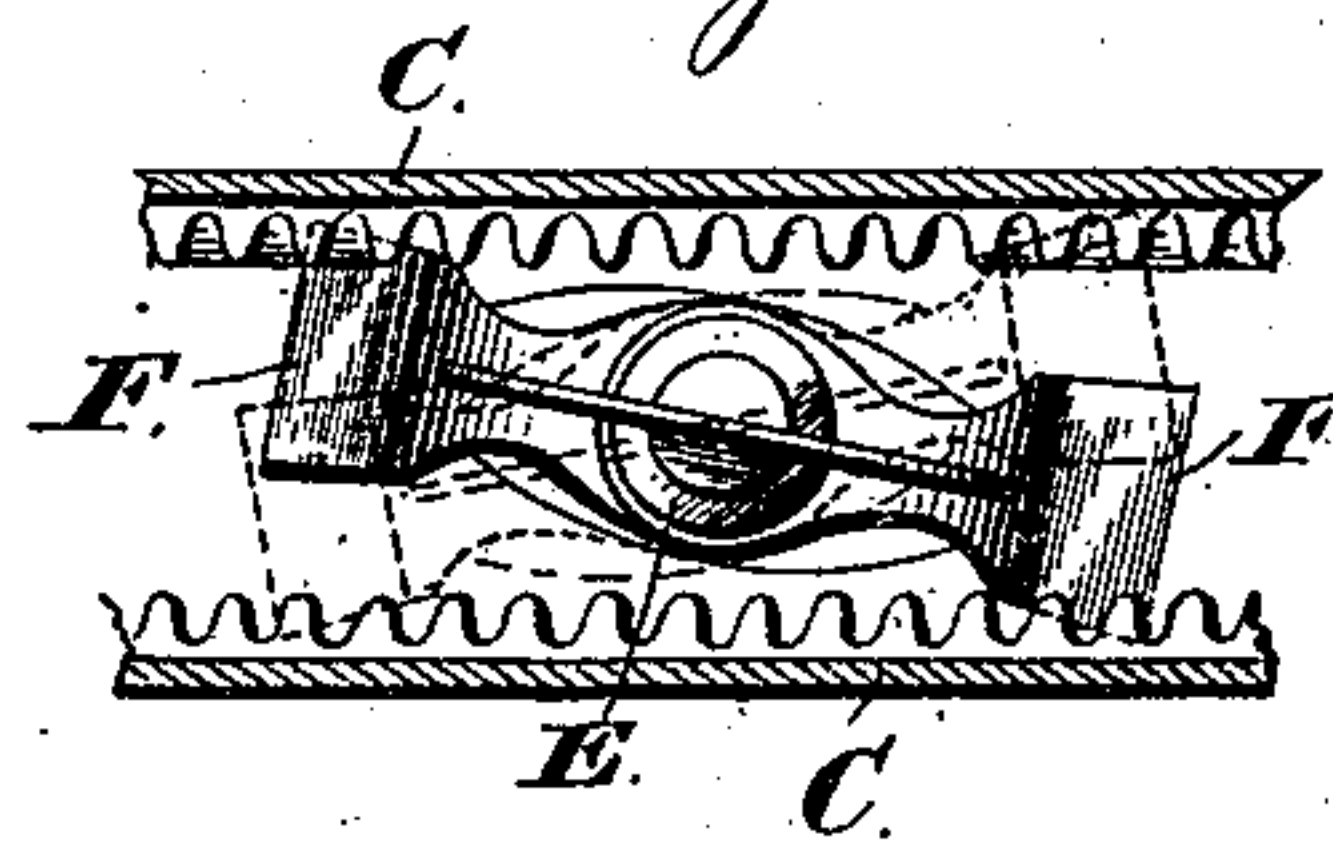
*Fig. 3.*



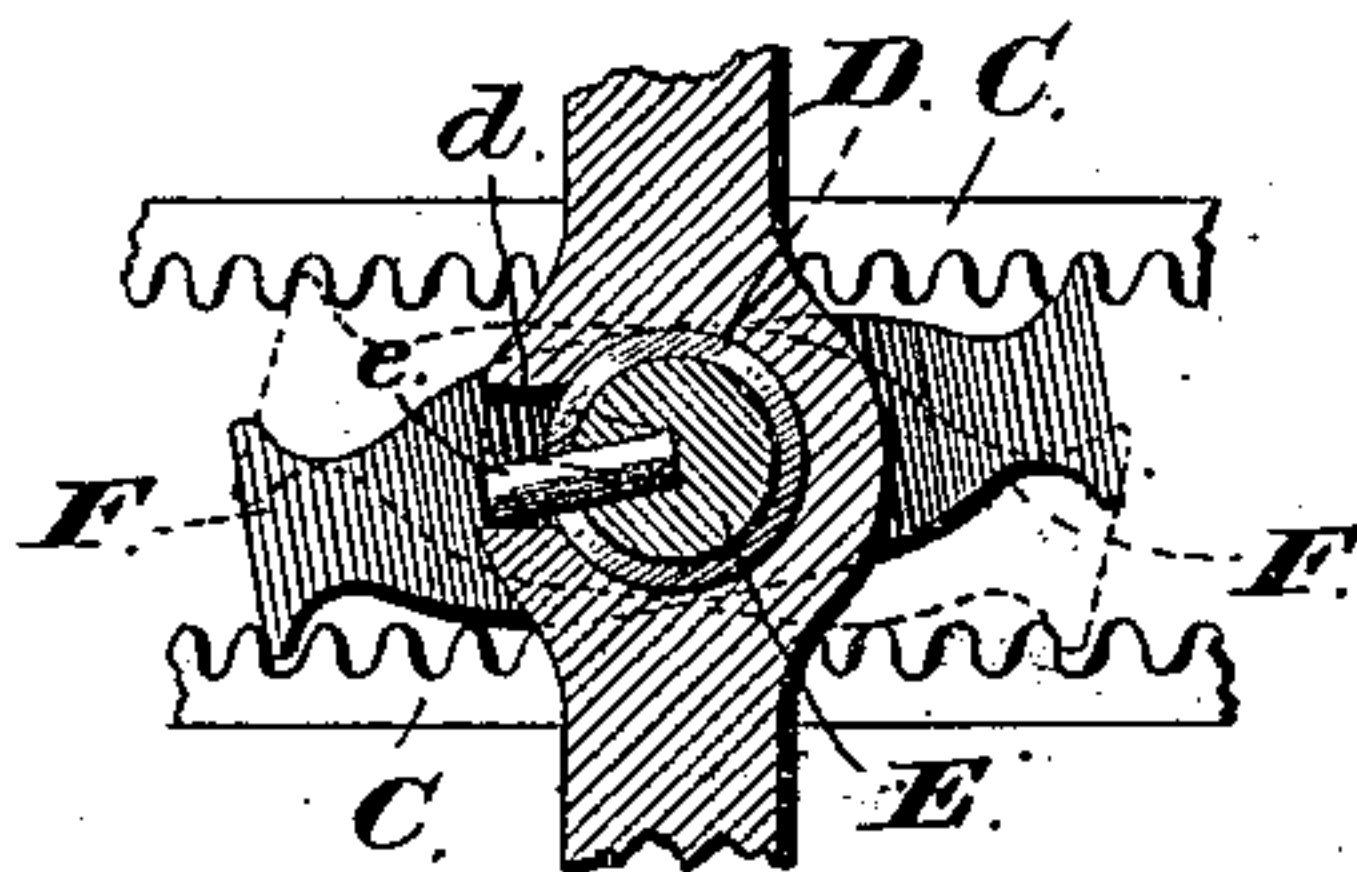
*Fig. 5.*



*Fig. 6.*



*Fig. 4.*



*Witnesses:*

*Jas. C. Hutchinson.*  
*Henry C. Hazard.*

*Inventors.*

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# UNITED STATES PATENT OFFICE.

DANIEL A. A. BUCK AND ARTHUR A. BUCK, OF CHESHIRE, CONNECTICUT.

## HAND-DRILL.

SPECIFICATION forming part of Letters Patent No. 355,585, dated January 4, 1887.

Application filed August 26, 1886. Serial No. 211,883. (No model.)

*To all whom it may concern:*

Be it known that we, DANIEL A. A. BUCK and ARTHUR A. BUCK, of Cheshire, in the county of New Haven, and in the State of Connecticut, have invented certain new and useful Improvements in Bits or Drill-Stocks; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of our tool as arranged for use, the full and dotted lines showing two positions of the operating-lever. Fig. 2 is a side elevation of the same, a portion of one of the gears being broken away to show the engaging-pawls. Fig. 3 is an enlarged front elevation of said pawl and its connecting parts. Fig. 4 is a plan view of the upper side of the same. Fig. 5 is an elevation of the inner end of the operating-lever, in which the pawls are shown in a central position by the full lines and by the dotted lines in position to engage with the gears; and Fig. 6 is a like view of the same, with said pawls shown in full and dotted lines, respectively, in engagement with said gear-wheels from opposite sides.

Letters of like name and kind refer to like parts in each of the figures.

The object of our invention is to increase the efficiency and capacity of ratchet-drills; and to this end our said invention consists, principally, in a ratchet-drill in which are combined two oppositely-arranged bevel-gears that engage with an interposed bevel-pinion, a reciprocable lever which is pivoted upon the axis of the gears, and two spring-actuated pawls that are independently pivoted between the latter upon an axis having a right angle to the axis of the same, and are each adapted to be moved into or out of contact with the teeth of either of said gears, and when in such contact to alternately engage with or ratchet over said teeth as said lever is reciprocated upon its axial bearing, substantially as and for the purpose hereinafter specified.

It consists, further, in a ratchet-drill in which are combined two oppositely-arranged bevel-gears that engage with an interposed bevel-pinion, a reciprocable lever which is pivoted upon the axis of the gears, and two spring-actuated pawls that are independently pivoted

between and adapted to be simultaneously moved into position for engagement with opposite gears by a partial rotation of the handle of the lever in one direction, and to have such engagement reversed by a partial rotation of said handle in the opposite direction, substantially as and for the purpose hereinafter shown.

In the carrying of our invention into practice a bit-stock, A, is journaled within one end of a frame, B, that upon its opposite end is provided with a handle, b, having any desired form. The bit-stock A is provided with a bevel-pinion, a, that meshes with and may be rotated by either of two bevel gear-wheels, C, which are journaled within the frame B, with their axes in a line having a right angle to the axis of said bit-stock.

Pivoted upon the axis of the wheels C and C is the forked end of a lever, D, which lever spans said wheels and is adapted to have its opposite end moved back and forth in a plane with the longitudinal axis of the frame A. The outer portion of the lever D has an axial opening, in which is journaled a handle, E, that has any desired length, and upon its inner end has pivoted two pawls, F and F, that extend, respectively, forward and backward, and at their outer ends are each adapted to engage with the teeth of either of the gears C and C. Said pawls have independent motion upon their pivotal bearing, but are normally held in a line with each other by means of a U-shaped spring, f, that has its body confined within the inner projecting end of said handle and each of its ends engaging with the inner side of one of said pawls. A stud, e, which projects from the handle E radially outward into a notch, d, in the lever D, operates to limit the rotary movement of said handle within the latter, so that when turned to the limit of its motion in either direction the radially-projecting ends of the spring f will move the pawls F F in the same direction and hold the outer free end of each with a yielding independent pressure in engagement with the teeth of the contiguous gear-wheel C.

The operation of the device thus constructed is as follows, viz: A drill or bit being supplied to the bit-stock, the end of such cutting-tool is placed in position upon the article to be operated upon, with the handle of the frame



against the breast of the operator and usually grasped by one of his hands, all in the usual way. The lever-handle is now grasped by the unoccupied hand of the operator and turned axially to the limit of its motion in one direction, after which, by moving said lever-handle backward and forward, each pawl will be caused to alternately engage with and to ratchet over the teeth of the wheel against which it is pressed, the result being that the gear-wheels are alternately partially rotated in opposite directions, and their motion being communicated to the bit-stock produces in the same an intermittent rotation in one direction.

It will be seen that upon its forward movement each pawl engages with and moves in the same direction the contiguous gear-wheel, while when moved rearward said pawl trips over the gear-teeth without engagement, such operation being permitted by the independent pivoting of the pawl.

Each pawl is always in position for instant engagement when moved forward, so that the movements of the lever in each direction are utilized to give motion to the cutting-tool. By turning the lever-handle to the opposite limit of its axial motion the direction in which the bit-stock revolves may be instantly reversed.

Having thus described our invention, what we claim is—

1. A ratchet-drill in which are combined two oppositely-arranged bevel-gears that engage with an interposed bevel-pinion, a reciprocable

lever which is pivoted upon the axis of the gears, and two spring-actuated pawls that are independently pivoted between the latter upon an axis having a right angle to the axis of the same, and are each adapted to be moved into or out of contact with the teeth of either of said gears, and when in such contact to alternately engage with or ratchet over said teeth as said lever is reciprocated upon its axial bearing, substantially as and for the purpose specified.

2. A ratchet-drill in which are combined two oppositely-arranged bevel-gears that engage with an interposed bevel-pinion, a reciprocable lever which is pivoted upon the axis of the gears, and two spring-actuated pawls that are independently pivoted between and adapted to be simultaneously moved into position for engagement with opposite gears by a partial rotation of the handle of the lever in one direction, and to have such engagement reversed by a partial rotation of said handle in the opposite direction, substantially as and for the purpose shown.

In testimony that we claim the foregoing we have hereunto set our hands this 12th day of March, A. D. 1886.

DANIEL A. A. BUCK.  
ARTHUR A. BUCK.

Witnesses:

EDWARD B. HANN,  
HALSEY W. KELLEY.