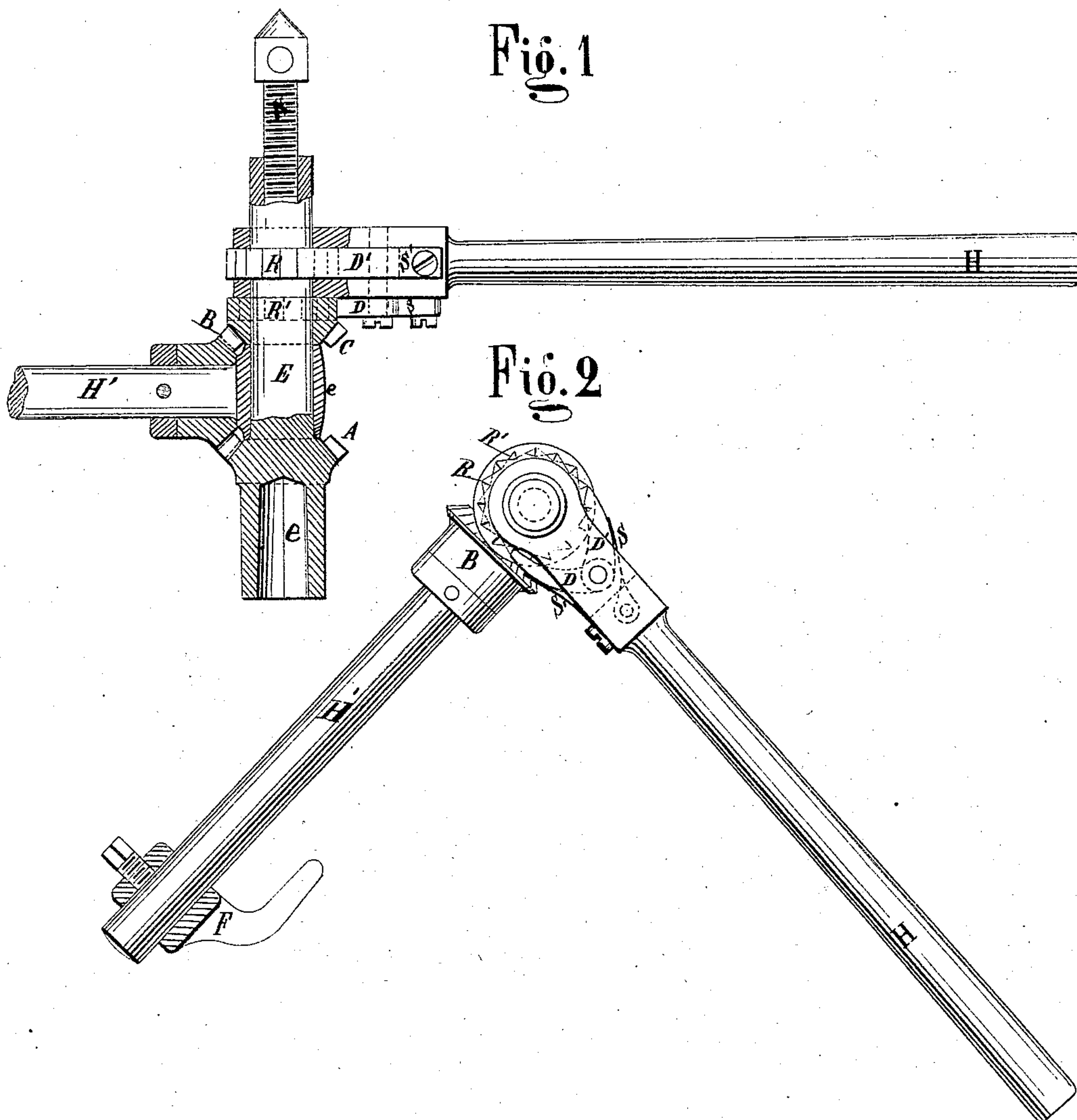


E. F. BONAVENTURE.

Ratchet-Drills.

No. 153,658.

Patented Aug. 4, 1874.



WITNESSES:

James H. Evans
Ben Clark

INVENTOR

E. F. Bonaventure

UNITED STATES PATENT OFFICE.

EDMOND F. BONAVENTURE, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF HIS RIGHT TO JAMES W. EVANS, OF NEW YORK CITY.

IMPROVEMENT IN RATCHET-DRILLS.

Specification forming part of Letters Patent No. **153,658**, dated August 4, 1874; application filed December 22, 1873.

To all whom it may concern:

Be it known that I, EDMOND F. BONAVENTURE, a resident of the city of New York, State of New York, have invented an Improvement in Hand-Drills, of which the following is a specification, reference being had to the accompanying drawings.

My invention consists in the combination, with the drill-stock, of two ratchets, operated by the same lever, whereby, through the agency of three co-acting beveled gears, the stock is turned in the same direction by opposite motions of the lever.

Figure 1 is a side view, partly in section, of a drill embodying my invention. Fig. 2 is an end view of the same.

E is the drill-stock, the lower end of which has a socket, *e*, to receive the drill, and is of a larger diameter than the remainder of the shaft, upon which the working parts are mounted. A is a beveled gear, made fast to the stock. H' is a handle or lever, the head *c* of which fits onto the body of the stock, and within which the stock freely revolves. Upon this lever is the beveled gear B, which revolves freely, and meshes into the gear A, and also into the gear C, which revolves freely on the stock E. R' is a ratchet-wheel, likewise revolving freely on the stock E, and may be made of one piece with the gear C. H is a second lever or handle, the forked head of which revolves freely upon the stock. Between the forks of the head is a second ratchet-wheel, R, made fast to the stock, the teeth of which are reversed with reference to those of the wheel R'. D and D' are two pawls, which engage, the former with the wheel R', and the latter with the wheel R. Both are pivoted in the head of the lever H, and respectively kept in place by the springs S and S'. K is the screw commonly used in this kind of drill-

stock to follow up the cut of the drill. F is an arm, adjustable by means of a set-screw upon the lever H', whereby the same may be made fast to a standard or support while the drill is being operated.

The operation of this drill-stock is as follows: The lever H' being held at rest, a backward and forward movement is given to the lever H. When it is carried to the left the pawl D', engaging with the ratchet-wheel R, will revolve the stock in the same direction. Upon carrying it back in the reverse direction, to the right, the pawl D, engaging with the ratchet-wheel R', revolves it and the gear C in such reverse direction; but the motion communicated through the gear B to the gear A will revolve the latter, and with it the stock to which it is made fast, in the reverse direction, or in the same direction in which it is moved by the swinging lever H—to the left. Thus it is evident that the stock is rotated in one and the same direction by the movement of the lever H, in whichever direction the latter is moved, thus utilizing the backward as well as forward movement of the handle in rotating the drill, and, of course, doubling the work accomplished by the ordinary hand ratchet-drill, in which the stock is revolved only by the forward movement of the handle.

I claim as my invention—

1. The combination of the stock E, the levers H and H', the ratchets R and R', and the gears A, B, and C, all combined and operating substantially as specified.

2. The arm H', in combination with the movable clutch F, all combined and operating substantially as specified.

EDMOND F. BONAVENTURE.

Witnesses:

JAMES W. EVANS,
BEN S. CLARK.