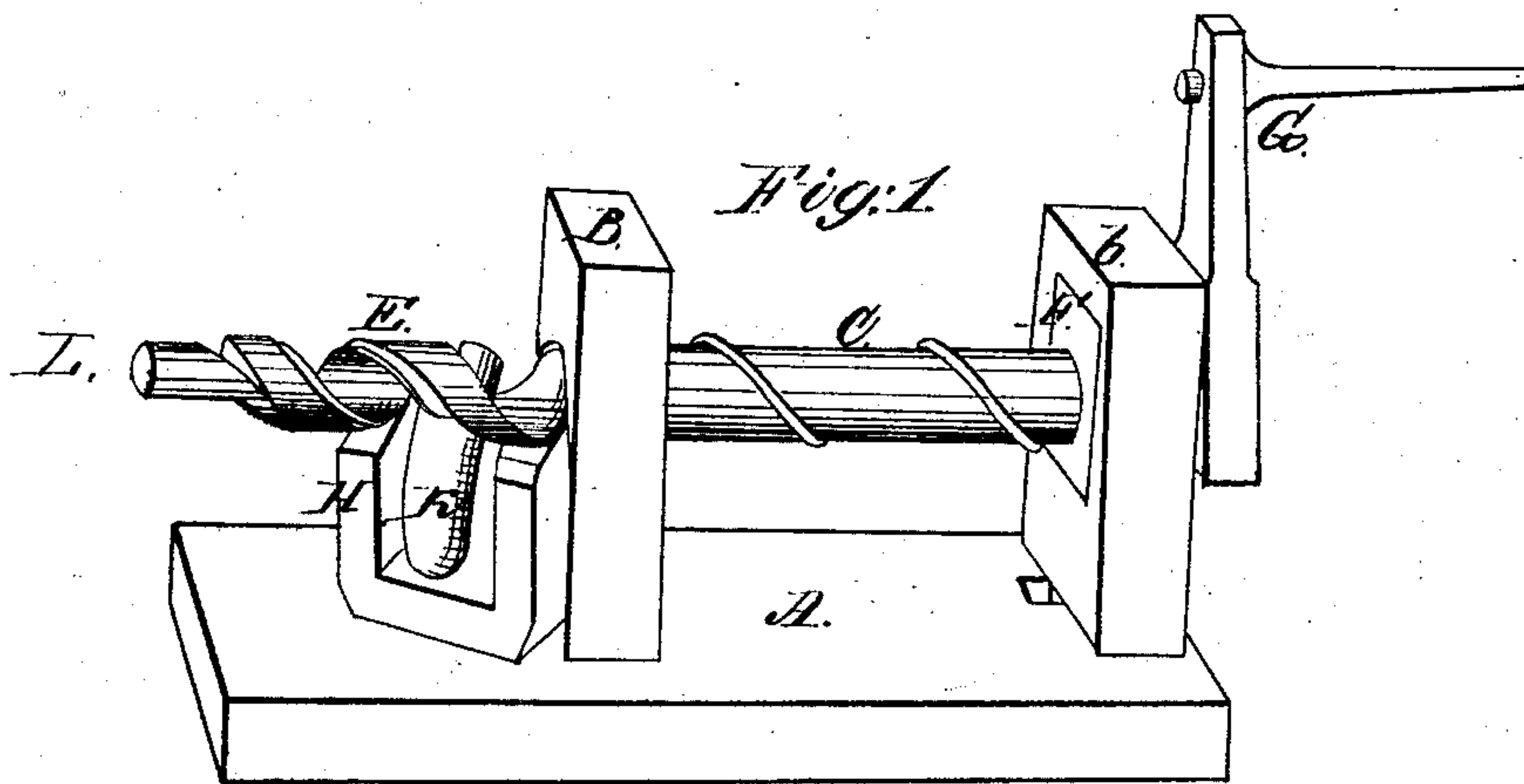
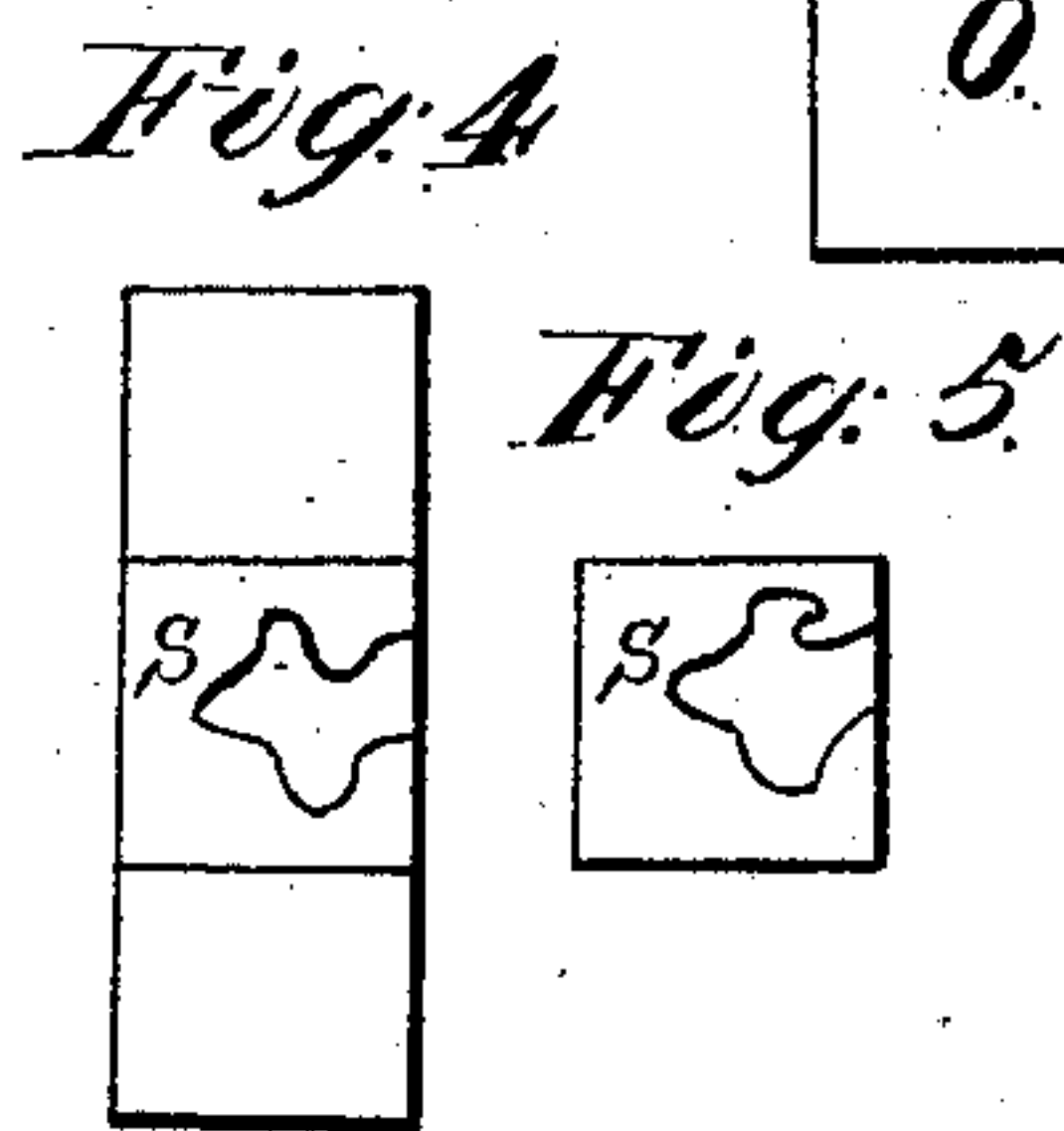
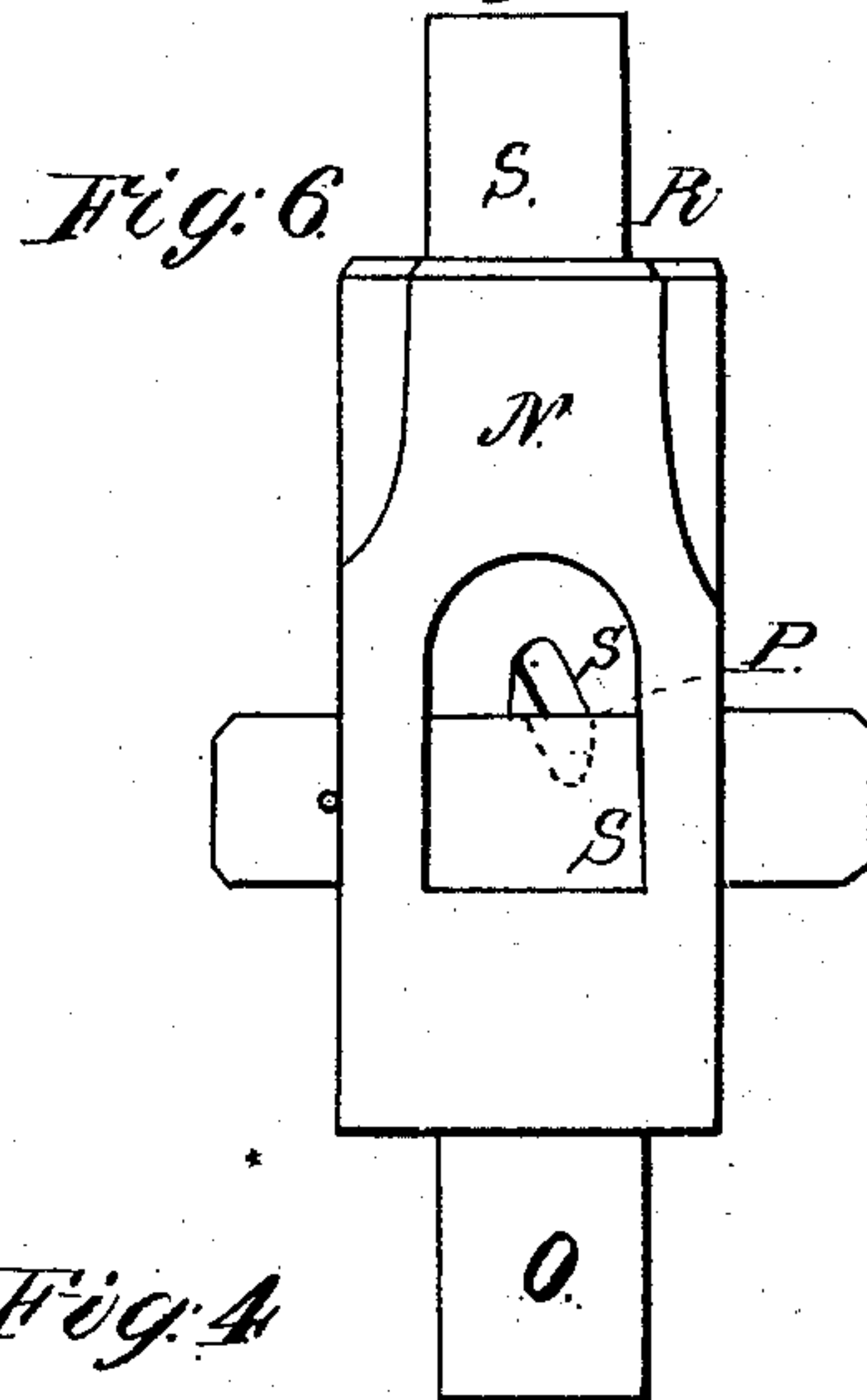
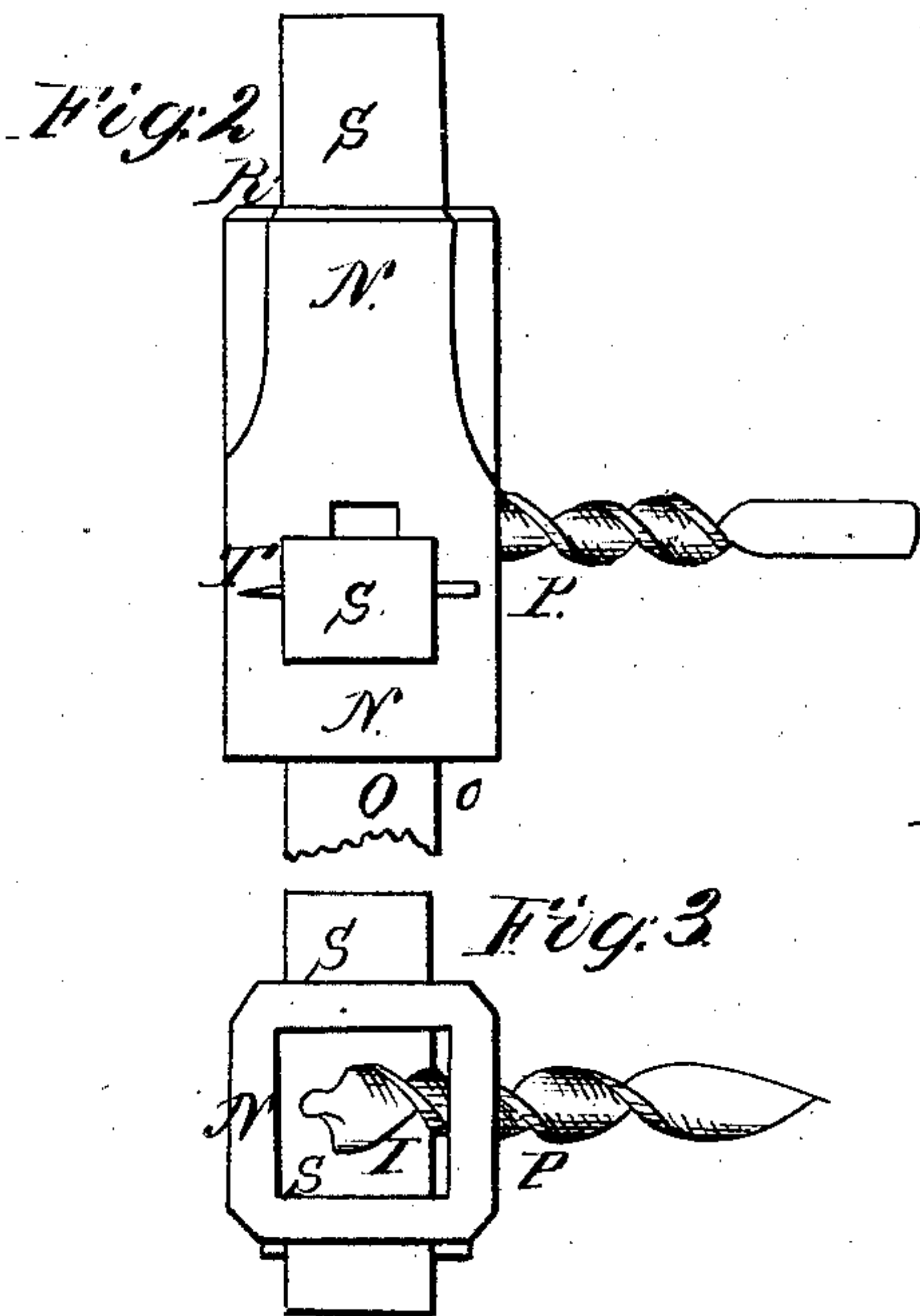


L'Hommedieu & Watrous,

Making Augers,

N^o 851.

Patented July 24, 1838.



UNITED STATES PATENT OFFICE.

E. L'HOMMEDIEU AND R. N. WATROUS, OF CHESTER, CONNECTICUT.

MACHINERY FOR MANUFACTURING DOUBLE-TWIST SCREW-AUGERS.

Specification forming part of Letters Patent No. 851, dated July 24, 1838; Reissued July 30, 1845, No. 72.

To all whom it may concern:

Be it known that we, EZRA L'HOMMEDIEU and RICHARD N. WATROUS, both of Chester, in the county of Middlesex and State of Connecticut, and both citizens of the United States, have invented a new and useful Improvement in the Manufacture of Double-Twist Augers, and in the Machinery Necessary to Effect the Same, and the following is a full and exact description, promising that the object of our invention and improvement is to form the twist of the auger by machinery adapted to that object and the lip with the center-worm or pintle by swaging in dies formed for that purpose, thereby producing the article more expeditiously and more perfectly than by any process heretofore known.

To enable others skilled in the art to make and use our invention and improvement, we describe its construction and operation as follows, consisting of two parts, both of which are necessary to form the auger.

1. *The machine for forming the twist.*—

This part of the machinery consists of a firm bed, supporting two upright posts of iron or other metal of suitable size for strength, well secured to the bed, standing one in front of the other, about 12 inches apart in the clear and rising about 6 inches high. Through these posts near the top we pass a horizontal shaft or mandrel of iron or steel, about two and a half feet long and one inch and a quarter in diameter. On the front end of this shaft, and extending about twelve inches from the end, we make a spiral semi-circular cavity so deep as to pass a little below the center of the shaft and on an angle of about 45 degrees with the line of the shaft, so that the end of the shaft moving in the front post will resemble the blade of a single twist auger. The remainder of the shaft is armed with a screw thread set at the same angle with that of the spiral cavity above described, which thread plays into a corresponding female screw in the rear post. On the end of the shaft projecting behind the rear post, we fix a crank to turn the shaft by. We then place a firm iron rest or stud in front of the front post, rising about 3 inches above the bed, and having an open mortise from the top two inches deep for the roller hereafter described to play in, and grooves on the top of the sides of the mortise to receive and

support the axle of the roller. The roller is of iron or steel about 3 inches in diameter and one inch thick, the edge being rounded to a semicircular face, fitting the spiral cavity of the shaft. The rest, supporting the roller is placed diagonally on the base in front of the post, and under the projecting shaft, the plane of the roller forming an angle with the shaft of about 45 degrees, so that the face edge of the roller will correspond with and fit into the spiral cavity of the shaft. The rest for the roller must be secured to the bed in such manner that it may be raised or lowered, and when set for use, the distance between the roller and the shaft, should be the thickness of the plate to be twisted. For further illustration we refer to the drawings accompanying this specification as part thereof.

Figure 1. A, the bed or base; B, b the ports. C the shaft or mandrel, exhibiting at one end the spiral semicircular cavity and at the other end at E a screw thread F female screw or box. G the crank to turn the shaft. H the rest or stud to support the roller. I mortise for the roller to move in. K the roller.

2. *The part of the machinery, to form the lips with the center worm or pintle.*—This part consists of a lower die of suitable form, firmly based, and a corresponding upper die upon the lower end of an upright shaft, made to rise and fall accurately, and with a force sufficient to form the parts intended by swedging. To effect this our machine consists of a cubical stock of cast iron or other suitable metal six inches square on all sides, with a shank or tenon at the bottom to secure it in the bed, or on a block. Through this stock is an open orifice one and a half inches square more or less from the front to the rear. The bottom of this orifice being about 2 inches from the bottom of the stock, to give access to the dies. This orifice is crossed at right angles by another mortise 12 inches square passing through the stock from side to side, to receive a horizontal bar, containing the bottom die, the bottom of this mortise being an inch lower than the bottom of the orifice of access first mentioned. From the center of the top of the stock, another mortise of the same size descends perpendicularly to the horizontal mortise. We then take two bars of steel of a size to fill these mortises; the piece for the

horizontal mortise, about 8 inches long, having a mortise and key at each end to secure it firmly in the stock. At the center in the upper face of this bar, near the front-edge
 5 cut a swage or die in the shape desired for the lower half of the head, lips and center worm of the auger when laid flat or horizontally upon it. Then in the lower end of the perpendicular bar, make a corresponding
 10 die for the upper side. The length of the perpendicular bar may be such as to extend above the stock so far as will be most convenient to apply the necessary power, either by the stroke of a hammer, a drop or any
 15 other force.

For further illustration see the drawings Fig. 2. N, represents the cubical stock. O its tenon to hold it firm in the bed. Fig. 3, P orifice of access to the dies. S, horizontal
 20 mortise for bottom dies. R mortise for perpendicular die. Figs. 4 and 5, S^b the horizontal bar with the key T and die in place. Figs. 5 and 6, the perpendicular bar with die s, on the lower end.

25 The operation of this machinery is as follows. Having by forging, in the usual manner, formed the shank, and plated the blade of a suitable width and thickness, leaving sufficient matter for the head; the edges of
 30 the blade should be turned up by swedging or otherwise so as to form a semicircular hollow to fit the semicircular edge of the roller. The blade is then bent from the line of the shank about 45 degrees or so as to fit
 35 the diagonal positions of the roller.

Then heat the blade and place the hollow of the part nearest the shank, on the roller and under the corresponding spiral cavity of the shaft and hold it firm: then by turn-

ing the crank of the spiral shaft the blade 40 thus interlocked is twisted uniformly and drawn from the machine straightened to the line of the shank. Then heat again the end to form the head, and place it on the lower
 45 die of the swaging machine and bring down the upper die with the necessary power and the lips with the center worm or pintle will be formed, ready for the finisher, in a more perfect manner and with greater expedition than by any other mode now in use.

This machinery in its size and proportions is calculated for augers of about one inch bore, but may be proportionally varied in size and strength to any size of auger
 55 and may be varied to any angle desired in the twist.

Claims—

1. We claim as our invention and improvement the machine for twisting the double twist common auger in its combination, as
 60 above specified and described—and any machine for the same purpose—made on the same principle and substantially in the same manner and form.

2. We also claim the method of making 65 or forming the lips, and the center worm or pintle of the double twist auger by means of the swedges constructed as herein described and for our invention and improvement thus specified and thus claimed we
 70 solicit Letters Patent.

Chester July 16th, 1838.

EZRA L'HOMMEDIEU.
 RICHARD N. WATROUS.

Witnesses:

JULIA L'HOMMEDIEU,
 STEPHEN L'HOMMEDIEU.