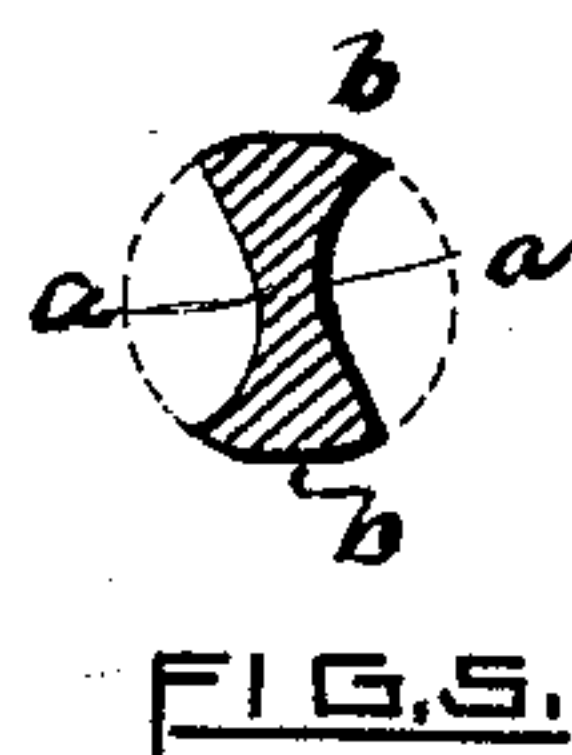
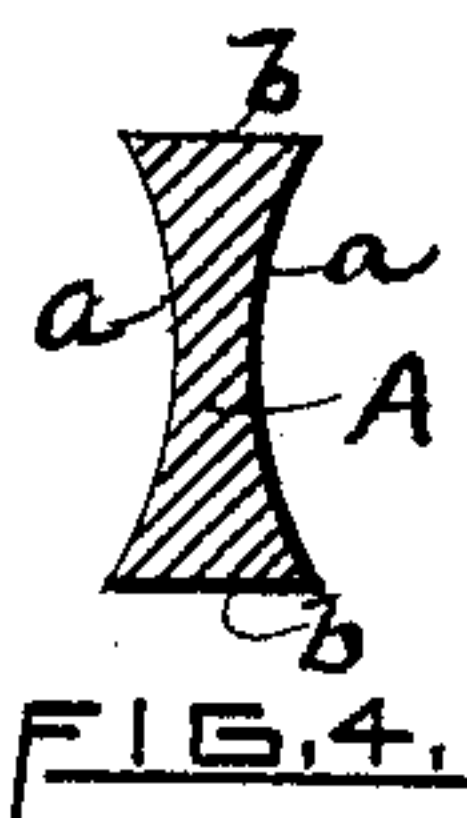
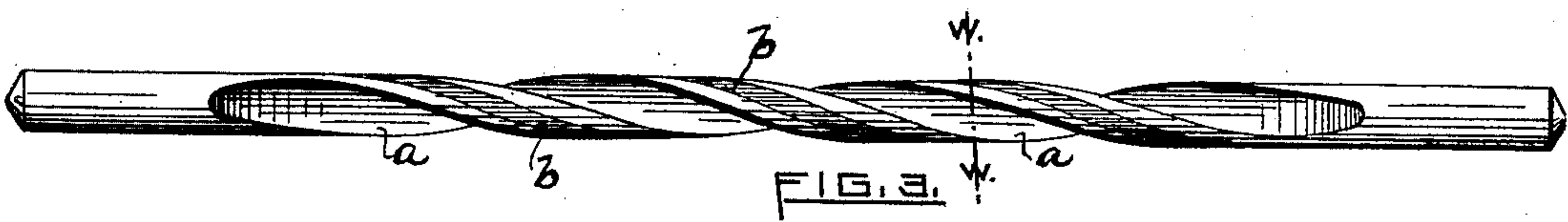
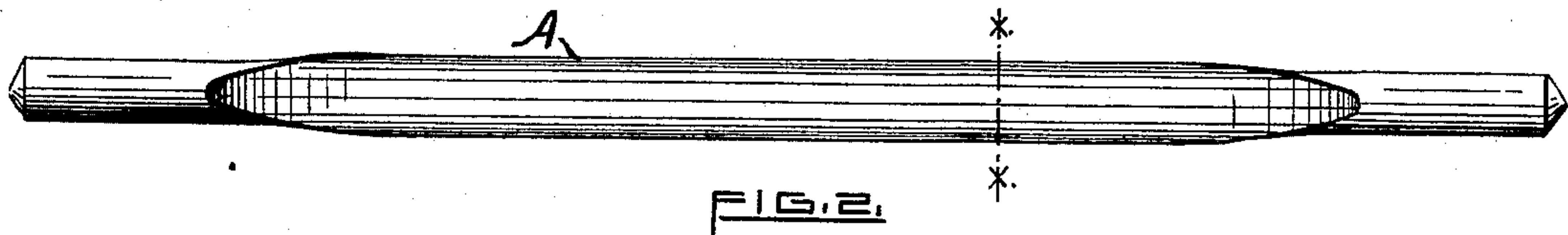
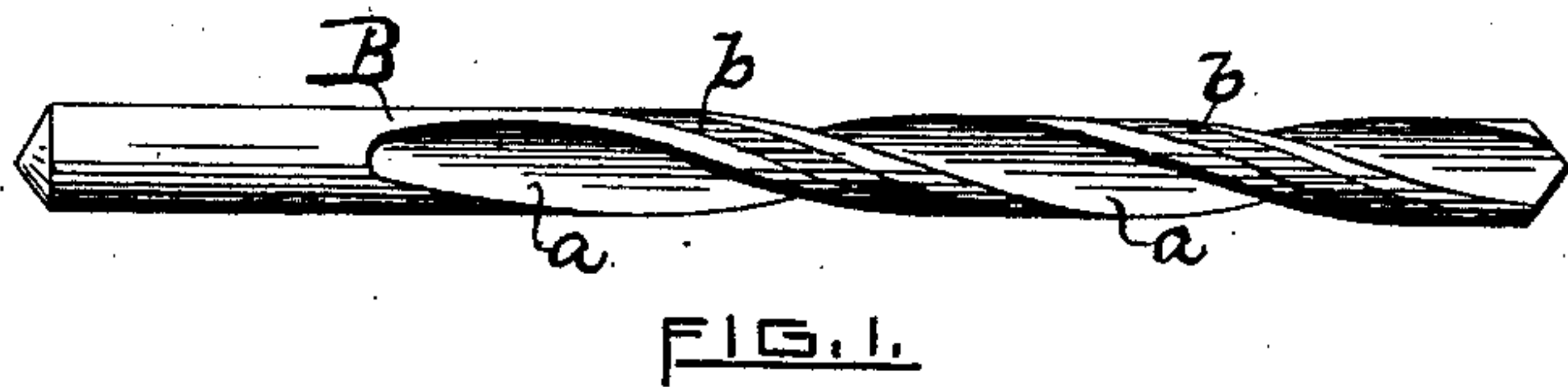


(No Model.)

S. FENNER & J. C. TAFT.
MANUFACTURE OF TWIST DRILLS.

No. 437,187.

Patented Sept. 30, 1890.



WITNESSES.

May D. Mason.

Richard T. Bowers.

INVENTOR

Jerome C. Taft

Sullivan Fenner
By the attorney Henry Black Jr.

UNITED STATES PATENT OFFICE.

SULLIVAN FENNER AND JEROME C. TAFT, OF PROVIDENCE, RHODE ISLAND,
ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, TO THE UNITED
STATES TWIST DRILL COMPANY, OF SAME PLACE.

MANUFACTURE OF TWIST-DRILLS.

SPECIFICATION forming part of Letters Patent No. 437,187, dated September 30, 1890.

Application filed June 18, 1888. Serial No. 277,465. (No model.)

To all whom it may concern:

Be it known that we, SULLIVAN FENNER and JEROME C. TAFT, both citizens of the United States, and residents of the city and county of Providence, in the State of Rhode Island, have invented a new and useful Improvement in the Manufacture of Twist-Drills, of which the following is a specification.

10 In the art of making twist drills as it was known and practiced prior to our invention it had been found that the drills would not clear themselves easily unless provision was made therefor by a delicate and expensive process of grinding or "backing off" of the drill between the grooves after twisting the blank. So essential to the usefulness and efficiency of the drill was this grinding or backing off considered to be that inventive skill had been directed to perfecting and producing machines and devices to perform that duty, and many devices to that end have been patented. Any process of grinding or backing off a drill involves nicety of adjustment and delicacy of manipulation and necessarily enhances the cost of the manufacture of the drill.

The purpose of our invention is to produce a twist-drill having the proper degree of clearance without grinding after twisting the blank. We accomplish this by forming upon two sides of a drill-blank concave surfaces for a portion of the length of the blank, and by forming between the concave surfaces for a corresponding distance on said blank flat surfaces. In order to insure positively the proper degree of clearance, we roll or forge one edge of each of the flat surfaces a trifle lower than the other edge. We then twist the blank into spiral form. If, as we consider preferable, we use a blank of about twice the length of a finished drill, we then cut the blank in two equal lengths and grind the end of each to a suitable point. The blank, whether of about the same or of about twice the length of the finished drill, is in the first instance of cylindrical form—that is to say, before the grooves and flat surfaces are rolled therein.

The finished drill is likewise of cylindrical form.

We do not claim herein the rolling of a blank of double the length of a finished drill and then dividing said blank to form two drills at a single operation, as that process is covered by Letters Patent No. 315,530, granted to Samuel Moore, April 14, 1885.

In the accompanying drawings, Figure 1 is an elevation of our completed drill. Fig. 2 is a plan view of the blank before it is twisted. Fig. 3 is an elevation showing the blank twisted to form two drills and showing the flat surfaces lying between the grooves. Fig. 4 is a section on line *x x* of Fig. 2, and Fig. 5 is a cross-section on line *w w* of Fig. 3.

Similar letters of reference indicate like parts where they occur in the drawings.

A represents the blank, which has been operated upon by suitable rolls or dies to bring it into the form shown in Fig. 4 in cross-section—that is to say, it is provided with two concave parallel surfaces and with two parallel flattened faces or edges lying between the concave faces. We twist the blank so formed into spiral shape, as shown in Fig. 3, and divide said blank into two parts to form two drills. It is obvious that we can use a blank of sufficient length to form only one drill at a single operation; but we consider that in rolling drills better results are obtainable by the use of the blank of double length.

It is evident that we can form the grooves and flat surfaces by milling or by forging, and in such cases the blank of single length is preferable.

a a represent the grooves or concave faces, and *b b* the flat faces.

B represents a drill constructed according to our invention with the parallel grooved and flattened surfaces.

We claim as our invention and desire to secure by Letters Patent—

1. The described method of manufacturing twist-drills, the same consisting in forming on the periphery of the drill between the grooves flat surfaces having one edge lower

than the other, whereby clearance is afforded to the drill.

2. As a new article of manufacture, the described drill, provided with flat surfaces *b*, lying parallel with and between the concaved surfaces or grooves and each having one edge lower than the other to serve, as specified, to afford clearance to the drill.

In testimony whereof we have hereunto set our hands, in presence of two witnesses, this 10 24th day of March, 1888.

SULLIVAN FENNER.
JEROME C. TAFT.

Witnesses:

HENRY MARSH, Jr.,
MAY D. MASON.