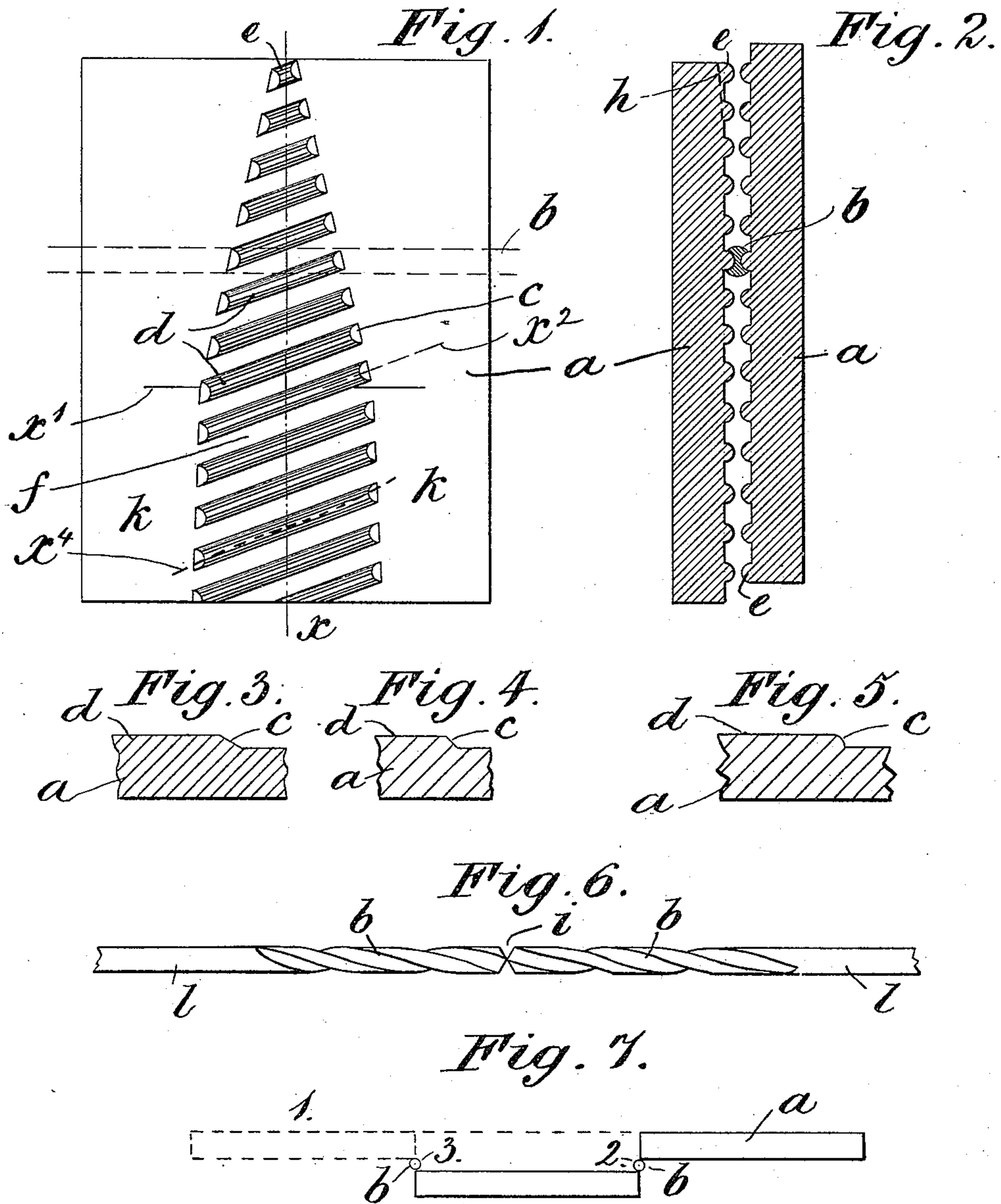


(No Model.)

A. LAUNDRY & H. H. WARREN.
SWAGING STOCK FOR DRILLS.

No. 428,498.

Patented May 20, 1890.



Witnesses.

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ANDREW LAUNDRY, OF CÔTE ST. PAUL, QUEBEC, CANADA, AND HENRY HARRISON WARREN, OF MASSENA, NEW YORK.

SWAGING-STOCK FOR DRILLS.

SPECIFICATION forming part of Letters Patent No. 428,498, dated May 20, 1890.

Application filed February 24, 1890. Serial No. 341,424. (No model.)

To all whom it may concern:

Be it known that we, ANDREW LAUNDRY, a subject of the Queen of Great Britain, residing at Côte St. Paul, in the District of Montreal and Province of Quebec, Canada, and HENRY HARRISON WARREN, a citizen of the United States, residing at Massena, in the county of St. Lawrence and State of New York, have jointly invented new and useful
5 Improvements in Apparatus for Forming Spirals; and we do hereby declare that the following is a full, clear, and exact description of the same.

Our present invention has reference to further improvements on the invention for which Letters Patent No. 382,710 were granted to us May 15, A. D. 1888, to adapt the invention thereby patented to form twist-drills and similar spiral forms, also to form two such
15 drills at one rolling operation with greater ease and accuracy, and also to produce as far as possible a lengthening effect upon the round bars being converted into spirals.

In the drawings hereunto annexed similar
25 letters of reference indicate like parts.

Figure 1 is a face view of one of the swage and rolling dies *a*. Fig. 2 is a vertical section on line *x*, Fig. 1, of a pair of swage and rolling dies *a*, placed in proper relative position and acting upon a bar *b*, converting it
30 into a spiral. Figs. 3, 4, and 5 are modifications of the formation of the ends *c* of the ribs *d* of the swaging and rolling dies *a*, the sections being taken at line *x*, Fig. 1. Fig. 6 is a view of the spiral after being formed, also showing the manner of parting it to form it into two twist-drills. Fig. 7 is a diagram showing the relative motion of the swaging and rolling dies *a* with each other.

40 *a* are the swage and rolling dies. These are constructed both alike, and are each provided with any desired number of ribs *d*, the first one of which *e* is very short, and they increase regularly in length down to the line
45 *x'*, where the regular increase in length of

the ribs *d* is very considerably diminished for the purpose of causing a finer finish to the spiral grooves that are swaged by the projections *d* in the bar *b*; or, in other words, the projections *d*, from the first *e* down to the
50 line *x'*, "rough-out" the grooves, and the remaining ribs on the other side of the line *x*, while they slightly increase the length of the spiral grooves, impart a finer finish, especially to the end of it. The ends of the ribs *c* are
55 terminated in a more or less acute bevel, as shown in Figs. 3 and 4, or may have a rounded configuration, as shown in Fig. 5, or any other beveled configuration desired, the configuration being made to agree with what is desired
60 to be imparted to the ends of the spiral grooves formed in the bar. Between the ribs spaces *f* are formed of such width and configuration as may be desired for the spiral being formed.

Although the ribs *b* are shown in Fig. 1 as
65 being straight, they may be slightly curved, if desired, as shown by the dotted *S*-curved line *x'*.

As shown, all the ribs are of equal size in cross-section; but, if desired, the ribs *e* may
70 be made slightly smaller than the others, or the ends of each of the swage rolling-dies may be slightly curved off, as shown by the line *h* in Fig. 2, which will come to the same thing, and will also assist the body or bar of
75 metal *b* to be entered freely between the dies at 2 in Fig. 7, 3 being taken to be the point of release, the swage and rolling-dies *a* being arranged to act together, as shown in Fig. 1 of the said Patent No. 382,710, and described
80 therein. The dies *a* may be either vertically or horizontally situated, as desired.

After the bar of metal has been acted upon by the dies *a*, it is by any ordinary means as at present in use parted at *i*, Fig. 6, forming
85 it into two twist-drills, as the surfaces *k*, one on each side of the ribs form solid ends *l* to the bars that are thus rolled into a spiral.

What we claim is as follows:

1. The combination of the swaging and roll- 90

ing dies a , each having ribs d , as described, of increasing length, with spaces f arranged face to face and caused to reciprocate and to act in parallel planes upon the bar of metal
5 placed between them, substantially as described.

2. The combination of the swaging and rolling dies a , each having diagonal parallel ribs d of increasing length, spaces f , and surfaces
10 or margins k , one at each side of the ribs, arranged face to face and caused to reciprocate and act in parallel planes upon a bar of

metal placed between them, the whole substantially as described.

ANDREW LAUNDRY.

HENRY HARRISON WARREN.

Witnesses to the signature of Andrew Laundry:

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W. P. DALY.