

J. W. ELLS.

Improvement in Merchantable Bars for Twist-Drills.

No. 129,543.

Patented July 16, 1872.

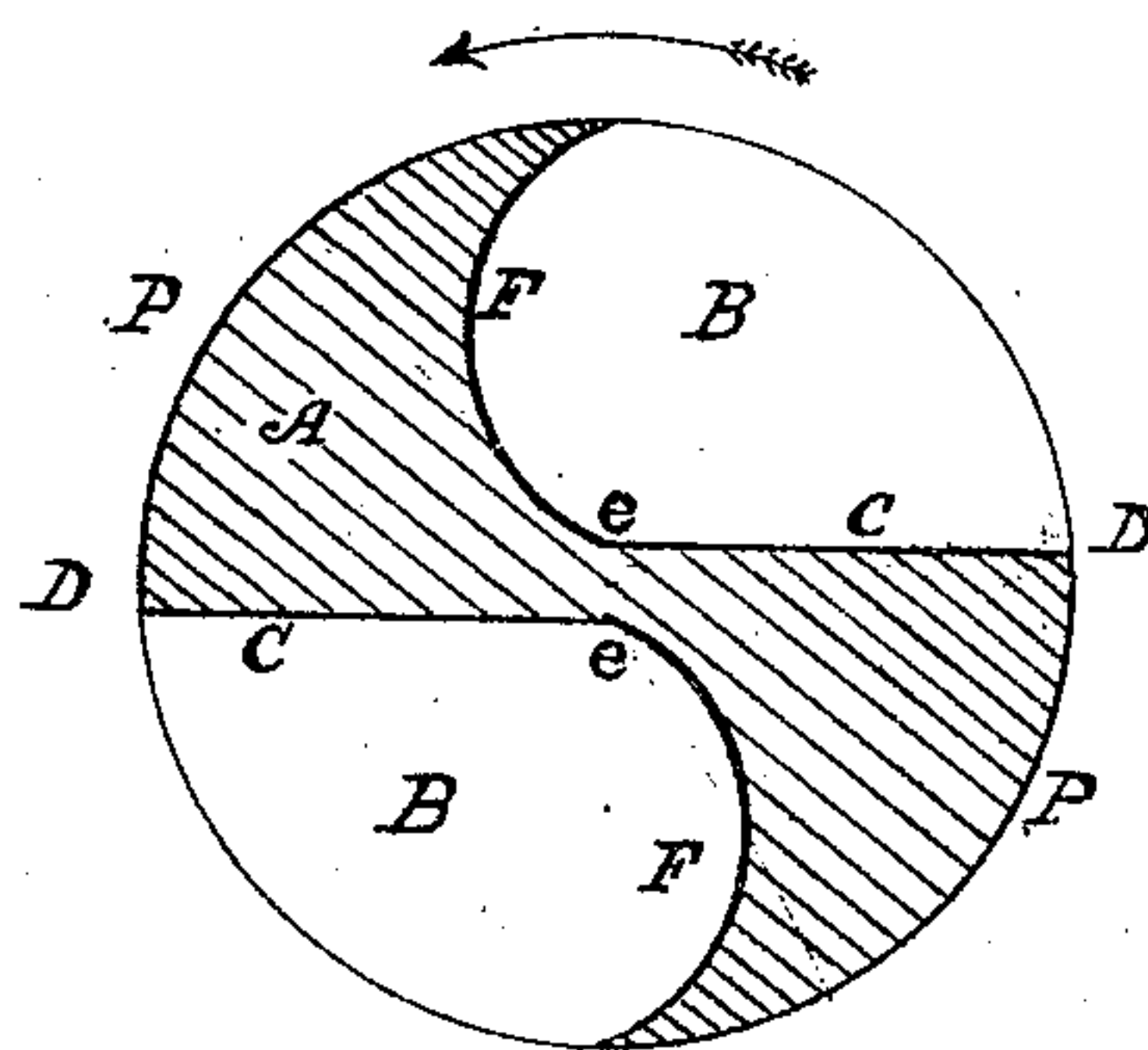
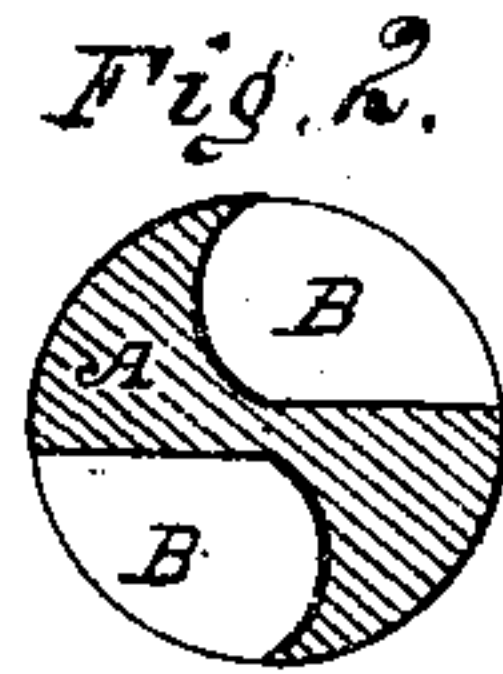
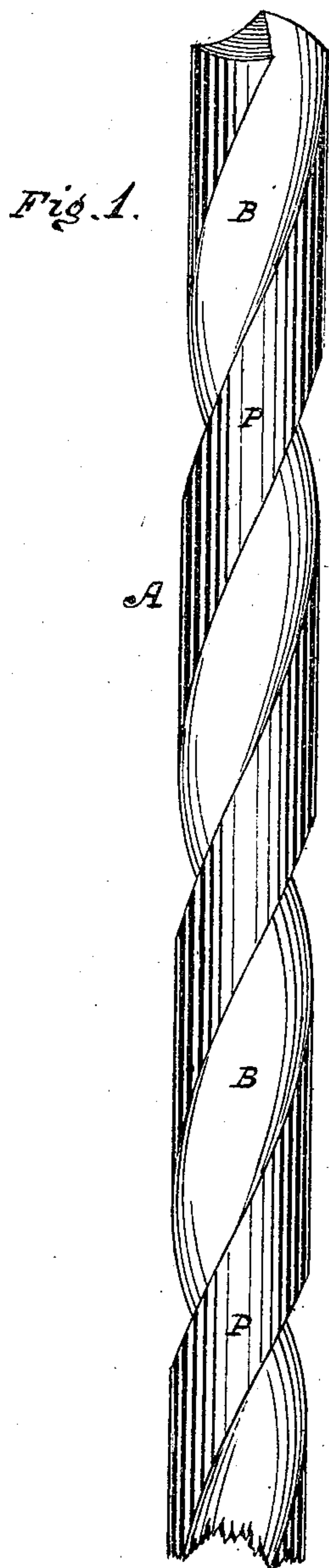


Fig. 3.

Attest

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IMPROVEMENT IN MERCHANTABLE BARS FOR TWIST-DRILLS.

Specification forming part of Letters Patent No. 129,543, dated July 16, 1872.

Specification describing certain Improvements in "Merchantable Bar-Steel," invented by JOSIAH W. ELLS, of Pittsburg, in the county of Allegheny and State of Pennsylvania.

My invention consists of a metallic bar, of uniform thickness throughout, so shaped and twisted its entire length as to produce and leave on each of its sides a spiral groove of such a form as that one side, or half of each groove, will be radial, or nearly so, to the axis of said bar by presenting a straight line from a point near the center of the bar to its outer edge or circumference, and the other side or half of each groove be curved by presenting a circular line from the inner edge of the straight portion outward to its periphery, the object being the construction of steel bars of such a character, condition, and shape as that, when cut transversely into sections, and one end of a section ground at the ordinary angle for such purposes and hardened, a twist-drill will be formed of a superior kind, cheaply, without forging or other process of manufacture.

To enable others to make steel bars in accordance with my invention, I will proceed to describe their mode of construction and necessary shape by reference to the accompanying drawing, wherein—

Figure 1 represents a perspective view of my improved bar. Fig. 2 represents a transverse section of the same; Fig. 3, a transverse section, enlarged for the purposes of explanation.

To construct my improved bar I take an ingot or thick piece of metal, preferably good cast-steel, and, after heating it to a suitable temperature, "draw it down" or reduce it, by successive steps or stages or repeated passages between properly-constructed rolls having grooves of gradually-diminishing size and requisite form, until it is brought to such a state and condition, with respect to external dimensions, as is best calculated to give it its general and final shape by the process or operation of twisting, which peculiar shape is clearly indicated in the transverse sections represented by the drawing, Figs. 2 and 3, the twisting of the bar being accomplished by causing the reduction and shaping rolls to force it, as it leaves them in its "last pass," through a die or guide so constructed, arranged, and made to operate with relation thereto as to give and produce in said bar a

proper and desirable amount of spiral curvature, shown in the drawing, Fig. 1. This finished bar A has not only a spiral groove, B, on each side and its entire length, but is so shaped with respect to its transverse section as that one side, C, or half of each groove, presents a straight line from a point, *e*, near the center of the bar to its circumference D in the direction of, or parallel to, its radius, and the other side, F, of each groove B is curved or presents a curved line from the central point *e* outward to the edges of the bar, which edges, or those parts P between the grooves B, are circumferential, or describe the arc of a regular circle, D.

This construction or form of bar is such as to admit of its being cheaply and expeditiously converted into twist-drills, &c., in the manner hereinbefore stated, regardless of whatever portion of the bar they may be taken from, so that the straight or radial sides C of each groove B will constitute the cutting parts of the drill and present a straight edge or lip to the metal or other substance being operated on, while the opposite or curved side F will gather and facilitate the discharge of the borings or chips.

The form of this bar gives it all the strength possible consistent with room sufficient for the easy passage of the borings or cuttings, and carries with it its entire length those qualities that make it readily and easily adapted to the purposes for which it is intended.

Claim.

I claim as a new, improved, and merchantable article of manufacture—

A metallic bar, of uniform thickness throughout, so shaped and twisted its entire length as to produce and leave on each of its sides a spiral groove of such a form as that one side, or half of each groove, will be radial, or nearly so, to its axis of rotation by presenting a straight line from a point near the center of the bar to its outer edge or circumference, and the other side or half of each groove be curved by presenting a curved line from said central point to the periphery, substantially as shown and described, for the purposes set forth.

JOSIAH W. ELLS.

Witnesses:

ED. M. JOHNSTON,
B. WELDON.