

(No Model.)

M. C. JOHNSON.  
BORING TOOL.

No. 472,541.

Patented Apr. 12, 1892.

Fig. 1

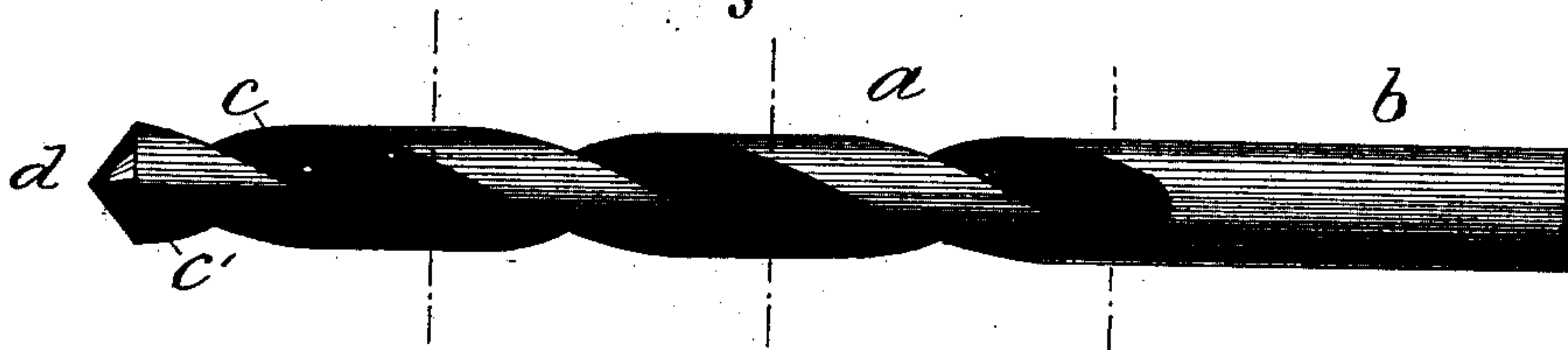


Fig. 2

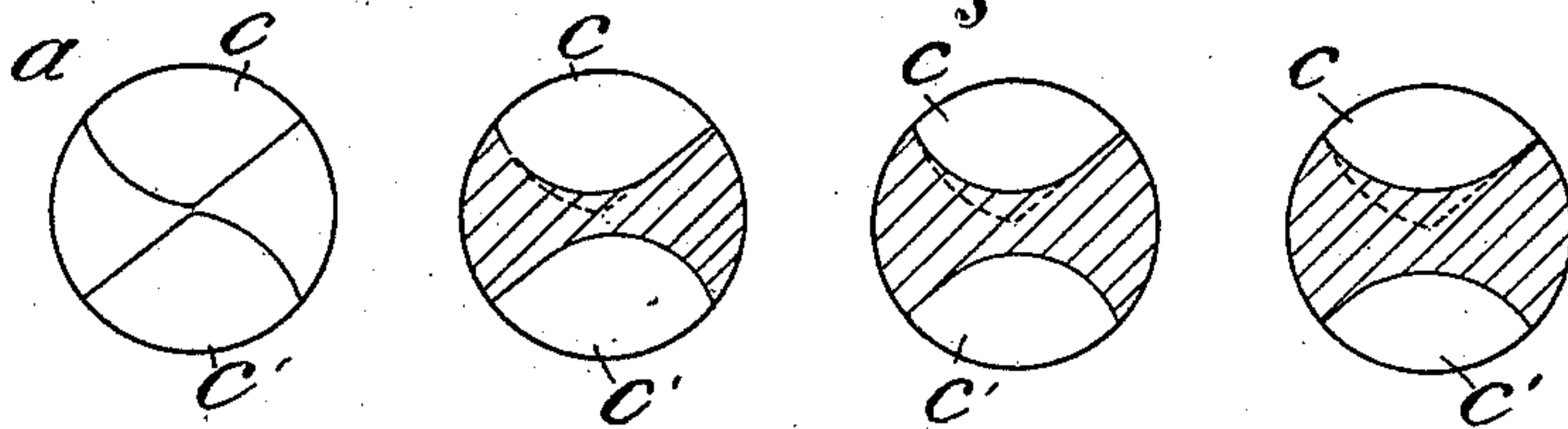


Fig. 3

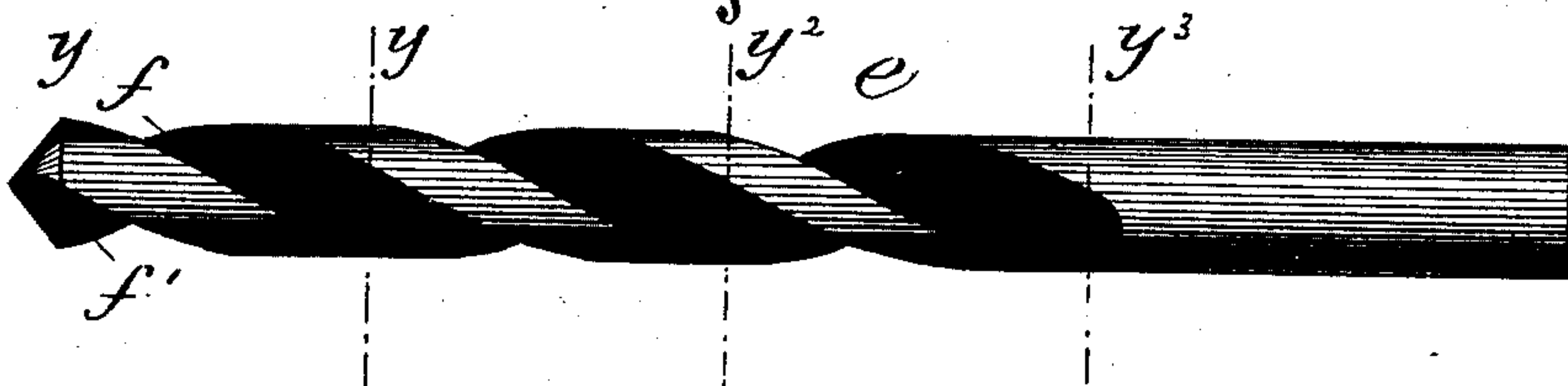
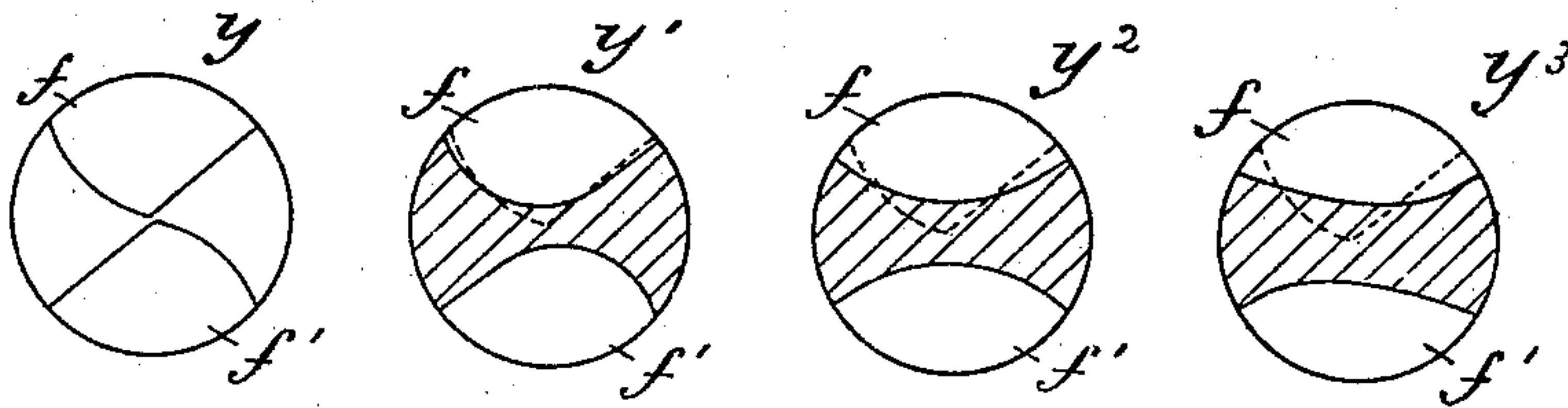


Fig. 4



Witnesses:

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Inventor,

Moses C. Johnson,  
by Chas. L. Burdett,  
att'y

# UNITED STATES PATENT OFFICE.

MOSES C. JOHNSON, OF HARTFORD, ASSIGNOR TO THE T. & B. TOOL  
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## BORING-TOOL.

SPECIFICATION forming part of Letters Patent No. 472,541, dated April 12, 1892.

Application filed September 8, 1891. Serial No. 405,129. (No model.)

*To all whom it may concern:*

Be it known that I, MOSES C. JOHNSON, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Boring-Tools, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

My invention relates to the class of tools used for boring holes that are made with a spiral groove; and its object is to provide a boring-tool of that class that shall possess at once strength of shaft, permanency of the cutting-angle, and facility of clearing itself of chips.

My invention is herein described and illustrated as embodied in a twist-drill for metallic work; but it is equally well applicable to bits and like wood-working tools.

In the use of a twist-drill experience has shown that the web at the point of the drill must be thin, so as to present a sharp point for holding the drill central and produce a round and true hole, and that the drill will be weak and will break in use unless the web is made thicker along its length than at the point. This increase of thickness of web makes the groove shallower toward the shank end and causes the chips to clog the drill—a difficulty that has been overcome in prior twist-drills by increasing the pitch of the groove, with the resulting defect of so changing the angle of the cutting-lip at the point of the drill that after a comparatively slight wear a scraping and not a cutting edge is formed when the drill is resharpened in the ordinary manner.

My invention, that overcomes the above-described difficulties and objections in prior boring-tools, consists in a drill (and by this term bits and the like are meant) having a spiral groove of substantially constant pitch, the said groove being of an area in cross-section and at all parts between the point end and the shank end of the groove equal to or more than the cross-sectional area near the point end, or on the point side of the place of section; and it further consists in details of the drill, as more particularly hereinafter described, and pointed out in the claim.

Referring to the drawings, Figure 1 is a

side view of a twist-drill of the prior art. Fig. 2 shows the drill on enlarged scale in end view and in cross-section at several points along the length of the grooved part, denoted by the dotted lines in Fig. 1. Fig. 3 is a side view of a twist-drill embodying my invention. Fig. 4 shows my improved drill in end view on enlarged scale and in cross-section at several points, denoted by the dotted lines in Fig. 3 along the drill.

In the accompanying drawings the letter *a* denotes a twist-drill, having a shank *b*, grooves *cc'*, and point *d*. This drill is of old and common construction, the grooves *cc'* gradually shallowing from the point end to the shank end, leaving the web (that part of the drill that is directly included between the bottoms of the grooves) of gradually-increasing thickness from the point end to the shank end of the groove, as illustrated in the sectional views in Fig. 2. These sectional views, although taken on the planes denoted by the broken lines, are turned so that the grooves are shown on the upper and on the lower sides of the figures for the purpose of more conveniently comparing the cross-sectional area of the grooves at the several points of section. The cross-sectional area of the groove at the point end is represented on the several sections by the dotted outline of the bottom of the groove.

As already explained, that thinness of the web at the point of the drill that is essential to perfect work in boring would make the drill too weak for use if continued along the drill, and this necessitates a thickening of the web along the length of the drill back of the point, and this thickening is accompanied by the consequent shallowing of the groove, and this shallowing clogs the drill against the discharge of chips. In order to overcome this defect and also the defect present when the groove is made with an increased twist from the point end toward the shank, I cut, by any suitable means, in the drill *e* the grooves *ff'*, that are all substantially the same pitch from the point end to the shank end, but with the width of the groove constantly increasing as its depth decreases, so that the cross-sectional area, as at *y*<sup>3</sup> or any intermediate point along the groove, shall be as much as the cross-sec-



tional area at the point  $y$ , which is near the point of the drill. I thus retain in the drill the thinness of web at the point necessary to perfect working, the increased thickness of the web required to give the needed strength along the drill, the full area of the groove that allows the chips to be discharged freely, and also to preserve the pitch constant, so that in the grinding of the drill by ordinary methods and means the proper cutting-angle will be formed and a true cutting-edge obtained in resharpening the drill. The result is a drill that is much more perfect in action, free from clogging, and one that can be worn down to a greater extent than is the case of any one twist-drill of the prior art.

It is obvious that as a drill is usually constructed there is a point where the groove ends and a shank is formed for holding the drill in any suitable stock. The groove usually runs out at the point where the shank begins, and it is obvious that the cross-sectional area of the groove gradually runs out also, so that what has been stated with regard

to its area does not apply to that part of the groove where it terminates. The main feature of my invention is present when the groove is not precisely equal in area at all points between the point and the shank, but is substantially equal in cross-section—that is, does not appreciably or materially diminish in cross-sectional area from the point toward that end of the groove nearest the shank.

I claim as my invention—

As an improved article of manufacture, a drilling-tool having a spirally-grooved body, the groove being of substantially uniform pitch from point to shank and of an area in cross-section at any part between the point and the shank of the groove substantially equal to or more than the cross-sectional area of the groove near the point, all substantially as described.

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Witnesses:

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