

(No Model.)

2 Sheets—Sheet 1.

H. K. JONES.

DIE FOR SWAGING THE THREADS OF GIMLET POINTED SCREWS.

No. 444,554.

Patented Jan. 13, 1891.

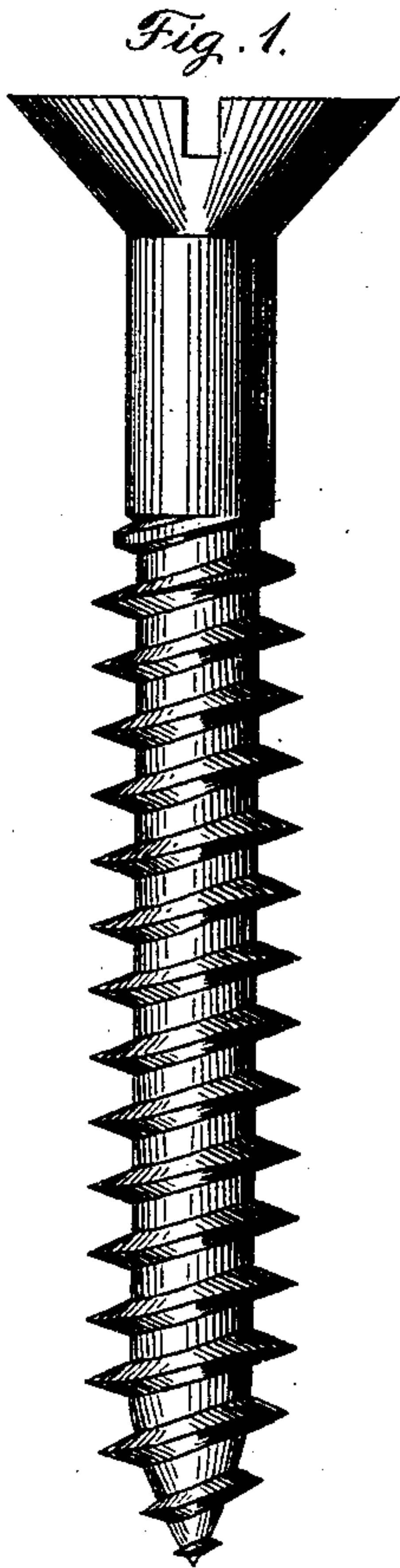


Fig. 2.

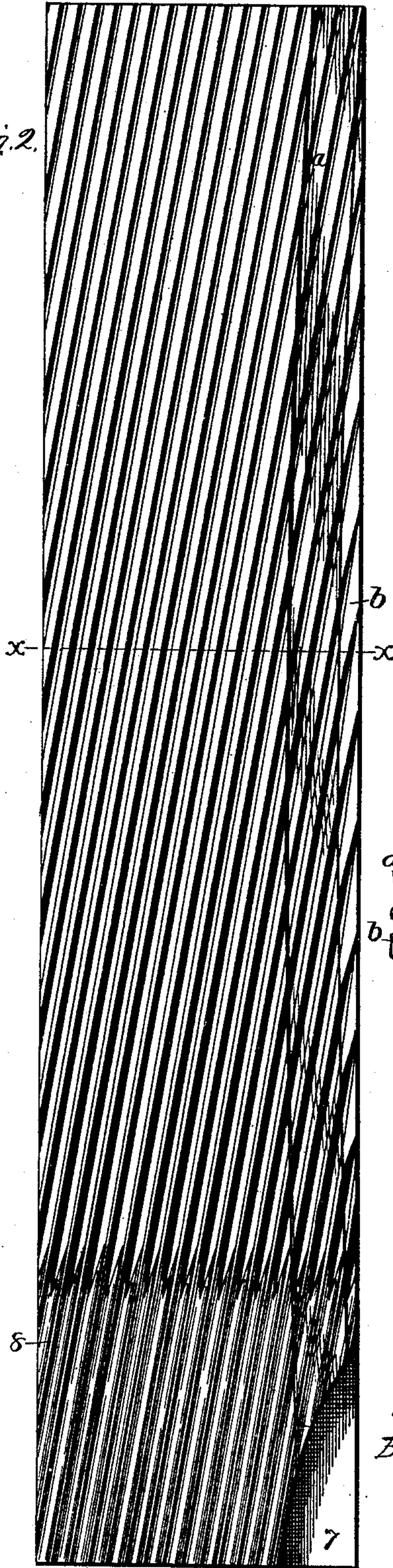
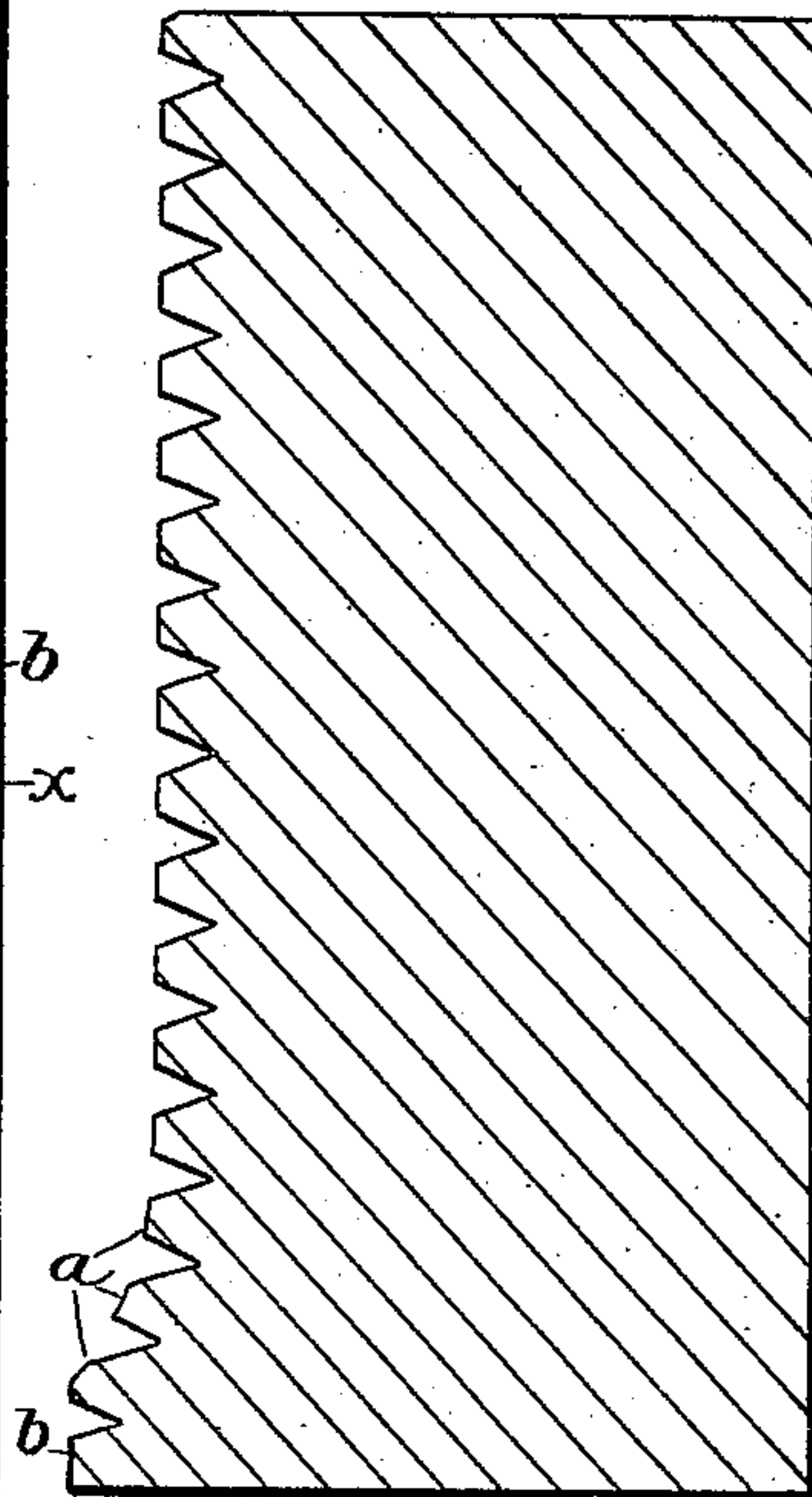


Fig. 3.



WITNESSES.
Edm. Edwards Jr.
W. H. Whiting.

INVENTOR.
Horace K. Jones.
By James Shepard
Atty.

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Fig. 4.

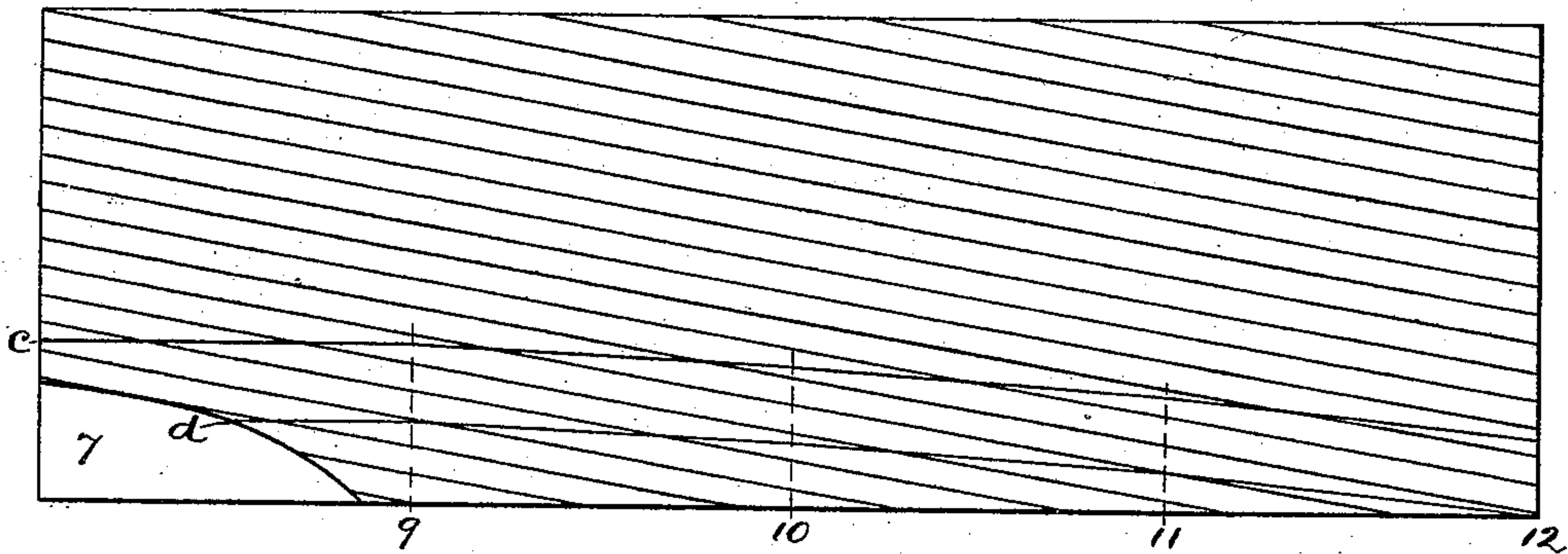


Fig. 5.

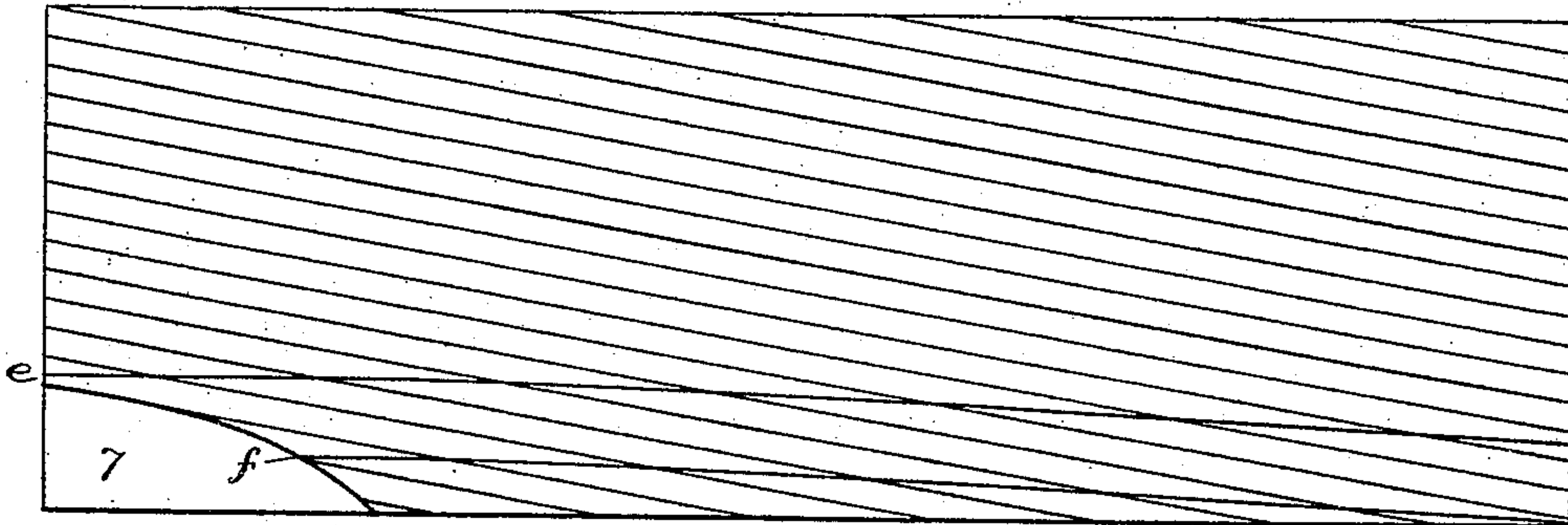
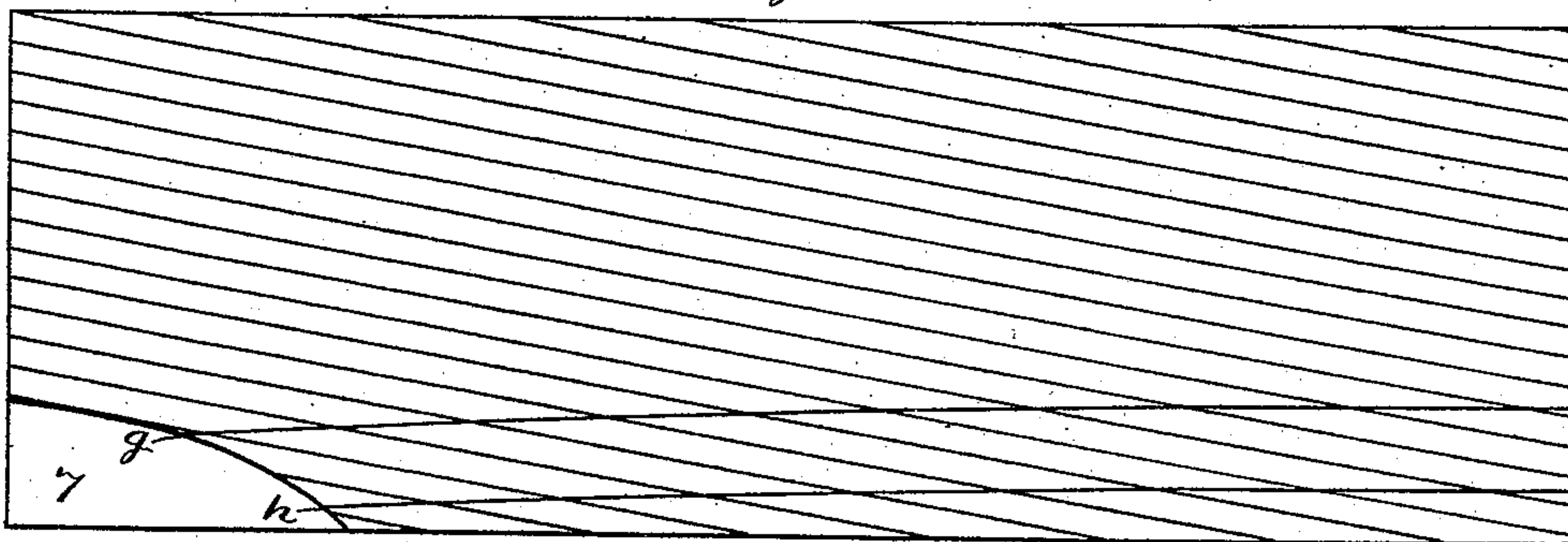


Fig. 6.



WITNESSES.
John Edwards Jr.
W. H. Whiting

INVENTOR.
Horace H. Jones.
By James Shepard Atty.

UNITED STATES PATENT OFFICE.

HORACE K. JONES, OF HARTFORD, ASSIGNOR TO THE RUSSELL & ERWIN MANUFACTURING COMPANY, OF NEW BRITAIN, CONNECTICUT.

DIE FOR SWAGING THE THREADS OF GIMLET-POINTED SCREWS.

SPECIFICATION forming part of Letters Patent No. 444,554, dated January 13, 1891.

Application filed November 1, 1890. Serial No. 370,020. (No model.)

To all whom it may concern:

Be it known that I, HORACE K. JONES, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Dies for Swaging the Threads of Gimlet-Pointed Screws, of which the following is a specification.

My invention relates to improvements in dies for swaging the threads of gimlet-pointed screws; and the objects of my improvement are to keep the points of the screws in constant contact with the portion of the die which threads them as the screw is passing through the dies, and to construct a die for so doing in an inexpensive manner.

In the accompanying drawings, Figure 1 is an enlarged side elevation of a screw as threaded with my die. Fig. 2 is a plan view of one of my dies, the same being on a scale half the size of the scale for Fig. 1. Fig. 3 is a transverse section of one of my dies on the line $x x$ of Fig. 2, the scale being the same as that in Fig. 1; and Figs. 4, 5, and 6 are diagrams illustrating the face of one of my dies with slight modifications.

The die herein shown is provided with a cut-away portion 7 at the end which first engages the blank at the portion which threads the pointed end of the screw in accordance with my patent, No. 419,777, dated January 21, 1890, and in Fig. 2 I have illustrated the grooves at the beginning of the die of a round form, as at 8, in accordance with my patent, No. 425,035, dated April 8, 1890; but my invention is applicable to grooved and ribbed dies for swaging the threads of gimlet-pointed screws whether these improvements are present or not.

A pair of these dies set face to face and viewed in end view would give substantially the profile of the threaded portion of the screw. The major part of the face of each die is flat or straight across, with grooves extending obliquely along the length of the die at a uniform angle at regular distances apart corresponding to the desired pitch of the screw-thread. The portion for threading the point of the screw is elevated or projected from the face of the major portion of the die

on an incline to conform to the point of the screw, as indicated at a in Fig. 3, and by the curved shaded portion, as at a , Fig. 2. The oblique grooves in the face of the die are continued through this raised portion a . As in ordinary dies of this class the grooves are of a uniform angle and a uniform distance apart, while they taper so as to grow narrower toward the end of the die which last acts on the screw. Prior dies have had an elevated inclined portion thereon corresponding to a , excepting that its face was parallel to the edge of the die in a longitudinal direction; or, in other words, extended in a straight line from end to end. All dies which swage a thread by rolling so as to progressively raise it above the core of the screw gradually enlarge the circumference at the top of the thread as it is built up. This being the case, as the thread in rolling leaves one of the grooves to engage the next one it will necessarily strike upon one side of the groove instead of entering it squarely, thereby having a tendency to move the screw endwise toward the pointed end; or if there were no pointed end it would have a tendency to make the screw travel in the arc of a circle as it passes through the dies. With a straight elevated portion for threading the point, and with the grooves at a uniform angle thereto with a given size of wire, there is a tendency as the work proceeds to force the point of the screw against this elevated portion, and therefore it must be placed within the dies at the start with its pointed end slightly away from the elevated portion, so that the thread on the point will be swaged only by the last end of the die, or else the point of the screw will be driven with too much force against the elevated portion before it leaves the dies. My improvement is designed to overcome this objection and to cause the pointed end of the screw to be acted upon for substantially the whole length of the dies. In order to accomplish this result I make the inclined elevated portion a on a curve, as shown in Fig. 2. I prefer to make this curved portion begin at or near the front corner of the die and extending upwardly farther away from the lower edge of the die to near the middle of its length, and then

curved toward the lower edge again to the farther corner, leaving a flat portion *b* on the outside of the inclined elevated portion *a*, as shown. By this construction the portion of the dies which threads the point may be kept constantly in action and act upon the screw during substantially its entire passage through the dies. The grooves are at a uniform distance apart and of a uniform angle, so that they can be cheaply and conveniently made on an ordinary planer or milling-machine. The inclined elevated portion *a* may first be planed straight and then rounded with a file, leaving the die all in a single piece; or, if desired, after planing a straight inclined portion the die may be moved a little in the planer, so as to plane off portions of it to approach a curve and afterward finish the same by hand.

20 In Fig. 4 the parallel lines represent the grooves at the face of the die, and the space between the lines *c d* represents the inclined elevated portion for swaging the gimlet point, while the space below the line *d* and edge of the die corresponds with the plain portion *b* of Figs. 2 and 3. In this diagram the lines *c d* begin farther on the body of the die and extend parallel to the edge until they reach the point 9, where they form an angle and extend in a straight line to the point 10, form another angle and extend in a straight line to the point 11, form another angle and extend again in a straight line to the point 12 at the end of the die. It is evident that such an elevated inclined portion could readily be formed upon an ordinary planer, and it might be used without any rounding of the angles with

a file. In this and the following figures I have somewhat exaggerated the amount of curve or deviation of the inclined portion and its distance from the edge of the die. 40

The diagram Fig. 5 illustrates substantially the same form as in Fig. 4, except that the inclined elevated face between the lines *e f* is curved throughout its length instead of having the angular points 9, 10, and 11, and Fig. 6 illustrates a like inclined elevated portion between the lines *g h*, only it is curved in the reverse direction—that is to say, in Fig. 5 the lines begin on the body of the die and curve toward the lower edge—while in Fig. 6 they begin near the lower edge and curve inward on the body of the die. The operation of the dies in either of the forms suggested is the same. If desired, the upper edge of the die may be curved to make it parallel to the inclined elevated portion. 50 55

I claim as my invention—

The herein-described die for swaging gimlet-pointed screws, consisting of a transversely straight portion grooved at a uniform angle to its length for threading the body of the screw, and an inclined elevated portion through which said grooves are continued for swaging the point of the screw, which latter portion extends along by the side of said straight portion in a curved path, substantially as described, and for the purpose specified. 60 65

HORACE K. JONES.

Witnesses:

M. S. WIARD,
W. C. RUSSELL.