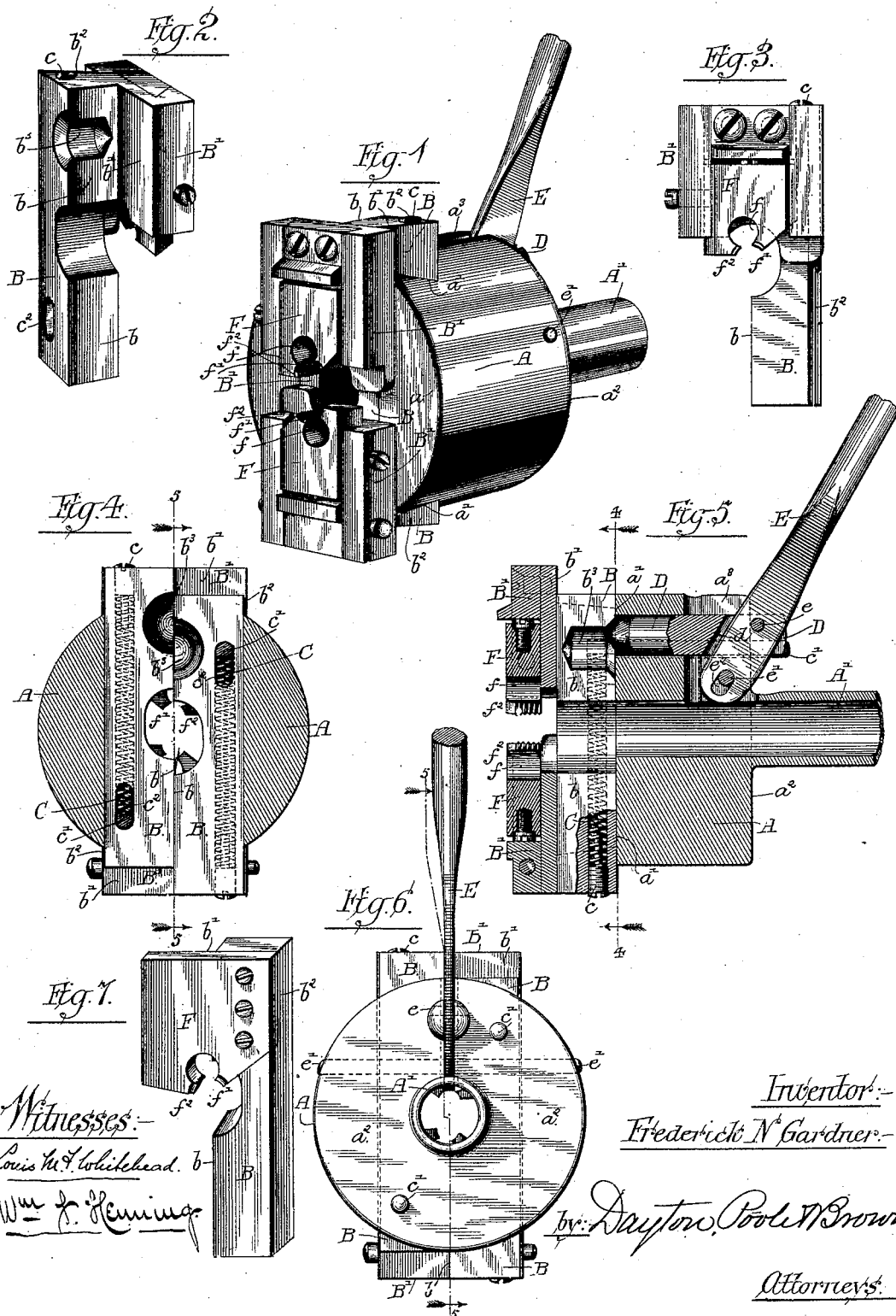


F. N. GARDNER.
DIE FOR SCREW CUTTING.

Patented Feb. 25, 1890.



UNITED STATES PATENT OFFICE.

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DIE FOR SCREW-CUTTING.

SPECIFICATION forming part of Letters Patent No. 422,340, dated February 25, 1890.

Application filed November 19, 1889. Serial No. 330,831. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK N. GARDNER, of Beloit, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Screw-Cutting Dies; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to screw-cutting dies of the class called "open" dies, or those in which the dies proper are in two or more parts, movably supported by a head and having a movement toward and from each other and toward and from the axial line of the head.

One object of the invention is to provide a construction by which the movable parts of the die are given a firmer support in the head or block in which they slide.

Another object of the invention is to provide an improved construction by which the parts of the die are forced toward each other and held while doing their work.

In the accompanying drawings, which illustrate familiar forms of a two-part die, Figure 1 is a perspective view of a construction containing the several improvements herein set forth. Fig. 2 is a perspective view of one part of the die detached, showing the elongated slide thereof, which is one feature of my improvement. Fig. 3 is a front detached view of one part of the die having the elongated slide. Fig. 4 is a transverse section of the die-head in the line 4 4 of Fig. 5, showing both parts of the die in rear view and in their retracted positions. Fig. 5 is a longitudinal section of the die-head in the line 5 5 of Fig. 4, which is the meeting line of the elongated slides of the die members. Fig. 6 is a rear end elevation of the die-head, having the slides of the die members mounted therein. Fig. 7 illustrates one part of a two-part die, in which the "chaser" is rigidly attached to the slide instead of being adjustably supported on the slide, as shown in the preceding figures.

A represents a head or block for the support of the movable die members, said head

being in this instance adapted by means of a shank A' to be inserted in the turret of a screw-cutting machine or in the chuck of the lathe, and having an axial hole extending through its shank to permit the passage of the screw which has been threaded by the die.

B B are two similar slides fitted to run in one or more grooves *a'*, formed in and across the front face *a* of the head A. Upon these slides similar members F F of a two-part die are shown to be secured. In Figs. 1 to 6 they are adjustably secured to the slides B by being fitted to move in grooved enlargements B' of said slides, while in Fig. 7 the member F of a two-part die is shown secured rigidly and directly to its slide B. It is to the support of the die members in their sliding movement with respect to the head A that one of my improvements relates, and said improvement consists in providing each member of the die with a slide that projects past the cutting-surface of the die and past the axis of the head, so that the slides of the two opposite die members overlap each other in the head.

In the present instance, and as preferably constructed in all cases, the slide B of each of the die members is made as long or longer than the width of the head A, in which it moves, so as to derive therefrom the utmost support possible. In the present instance also each slide B has a face *b*, which is in a plane at right angles to the plane of the die member and in the median line of said die member, as clearly shown in the drawings. Each slide therefore stands wholly at one side of the median line of the die member to which it belongs. The outer face *b*² of each slide is shown inclined, so as to give thereto the dovetailed form seen plainly in Figs. 1 and 2; but obviously other equivalent forms may be given to said slides for the attainment of the same result of holding them firmly in a correspondingly-shaped groove or grooves in the die-head. Thus constructed two similar die-slides can be placed side by side in contact with each other at their faces *b* in a single dovetailed groove *a'*, though it will obviously not be a departure from my invention if a separate groove be provided for each slide.

By providing each die member with a slide extended, as described, beyond the cutting-face of the die and beyond the axis of the head A, and by providing for the accommodation of such slides in the head by the arrangement of each slide at one side of the median line of the die to which it belongs, it is manifest that each die member will be more rigidly supported by the head, and the product of the die as a whole will be much more certain and uniform as to its diameter. The slides are shown cut away in line with the axial passage through the head and its shank.

In the best construction of which I can conceive the die-slides B B will be severally retracted by means of suitable springs. In the illustrations such springs are shown at C C as being expanding coiled springs seated in lengthwise holes in the slides and held in place at their outer ends by screws c c while bearing at their inner ends against the ends of pins c', which are inserted through the head from its rear face a² and project into slots c² in the slides. The slides being provided with such or similar operating-springs, the die as a whole automatically assumes the open position shown in Figs. 1, 4, and 5.

For the purpose of throwing the dies toward each other in opposition to the force of springs which separate them the slides are provided with recesses b³ in their meeting or proximate faces b, which recesses coincide or register with each other when the die is closed, or, in other words, when the slides have carried the members of the die to their inner limits of motion. When the slides are thrown to their outer positions by the springs C C, the recesses b³ assume the positions shown in Fig. 4, wherein it will be seen that they overlap each other, but are not fully coincident. Opposite these recesses is placed in the head A a sliding bolt D, the end of which is tapered or wedge-shaped, so that it may enter said recesses when in the position shown in Fig. 4, and by being thrust forward or toward the bottom of said recesses will force the latter into register by moving both of the slides to their inner positions—one in one direction and the other in the other—and in so doing close the die ready for cutting the screw-thread. A convenient way of forming the recesses b³ is to place the slides together in the positions they will occupy when the die members are at their inner positions and then drilling a round hole in the slides, one half of which

hole will be in one slide and the other half in the other slide. This also permits the use of a cylindric bolt D, which is itself conveniently formed, and for which a passage may be conveniently made in the head A by means of a drill. Other forms of the recesses and bolt may, however, manifestly be used.

The bolt D may be advanced and retracted by any suitable means, so far as my general invention relating thereto is concerned. For its rapid operation, however, I have provided a lever E, which is secured in a slot d of the bolt by a pivot-pin e and in a slot a³ of the head A by a pivot-pin e', said lever being provided with a slot e² lengthwise of the lever for the admission of said pin e'. The latter pin forms the fulcrum of the lever. In the use of the bolt D without a lock for holding it advanced into the slide B said bolt may be made to retain its advanced position and to thereby hold the die closed by having a sufficiently forward thrust, as indicated, to carry its parallel-sided part within the parallel walls of the recesses b³; but in the use of any form of lock it of course need not be so far advanced.

In the construction described a simple motion of the lever in one direction throws the parts of the device toward each other and into their working position, while a movement of the lever in the other direction permits them to instantly and automatically open.

I claim as my invention—

1. In combination with a head, two opposing die members, each having a slide which runs in the head, said slides passing or overlapping each other in the head.

2. In combination with a head and with opposing die members having overlapping slides which run in the head and which have recesses in their proximate faces, a sliding wedge movably supported in the head and entering the recesses of the slides for forcing the die members toward each other.

3. In combination with the head and the die members having overlapping slides provided with recesses b³, a sliding bolt D in the head, having its end tapered or wedge-shaped, and a lever for actuating said bolt.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

FREDERICK N. GARDNER.

Witnesses:

R. D. GARDE,

THOMAS P. BUCHANAN.