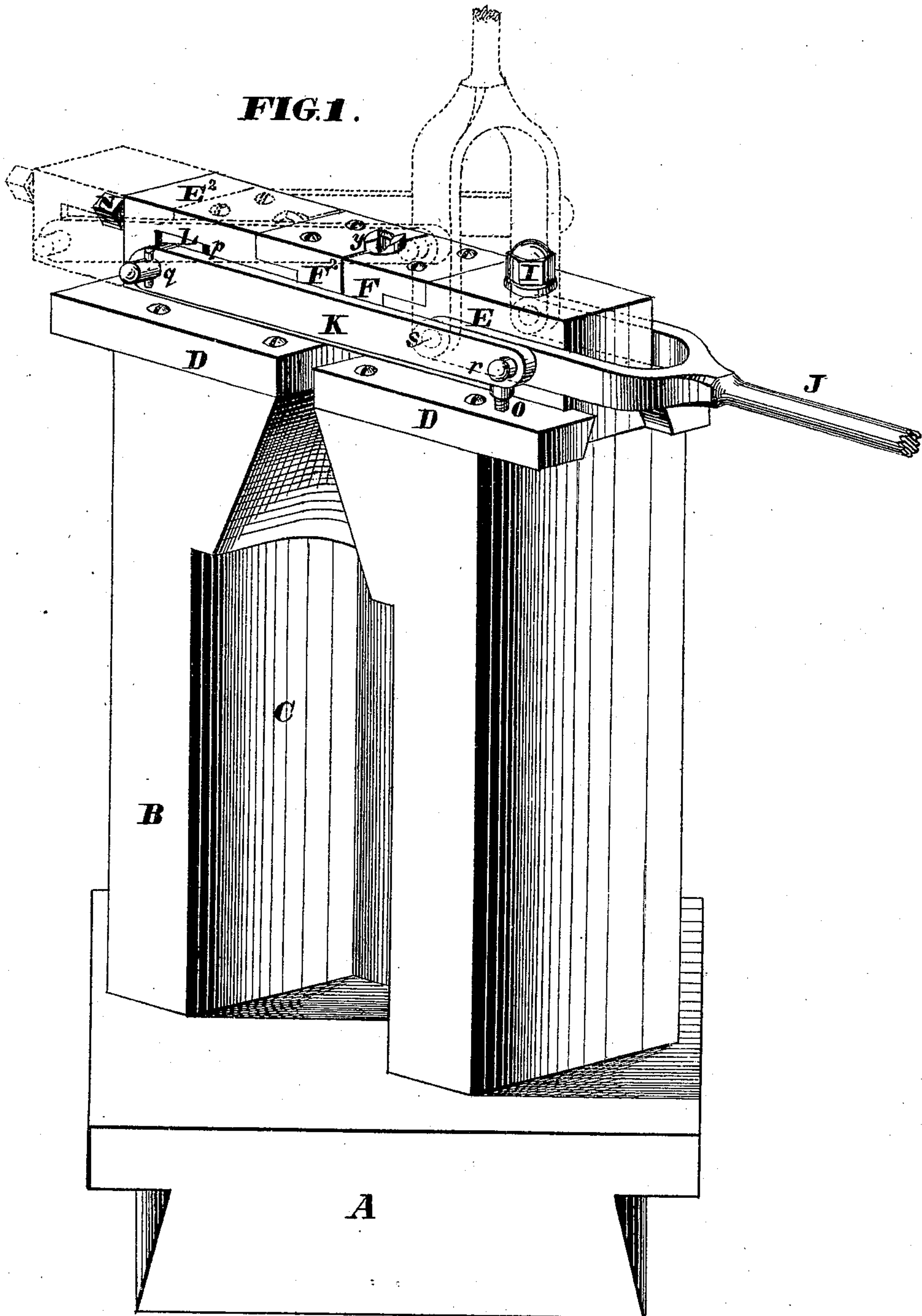


W. TUCKER.
Machines for Forming Auger-Bits.
No. 151,325. Patented May 26, 1874.



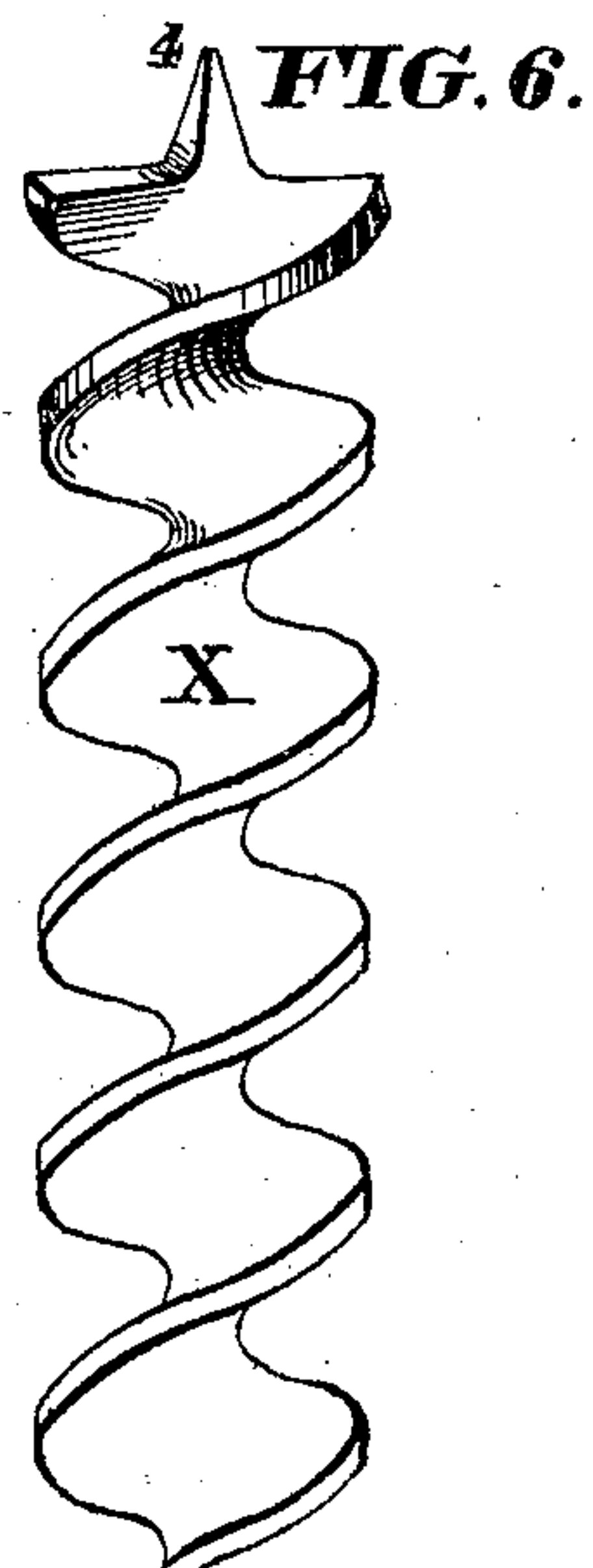
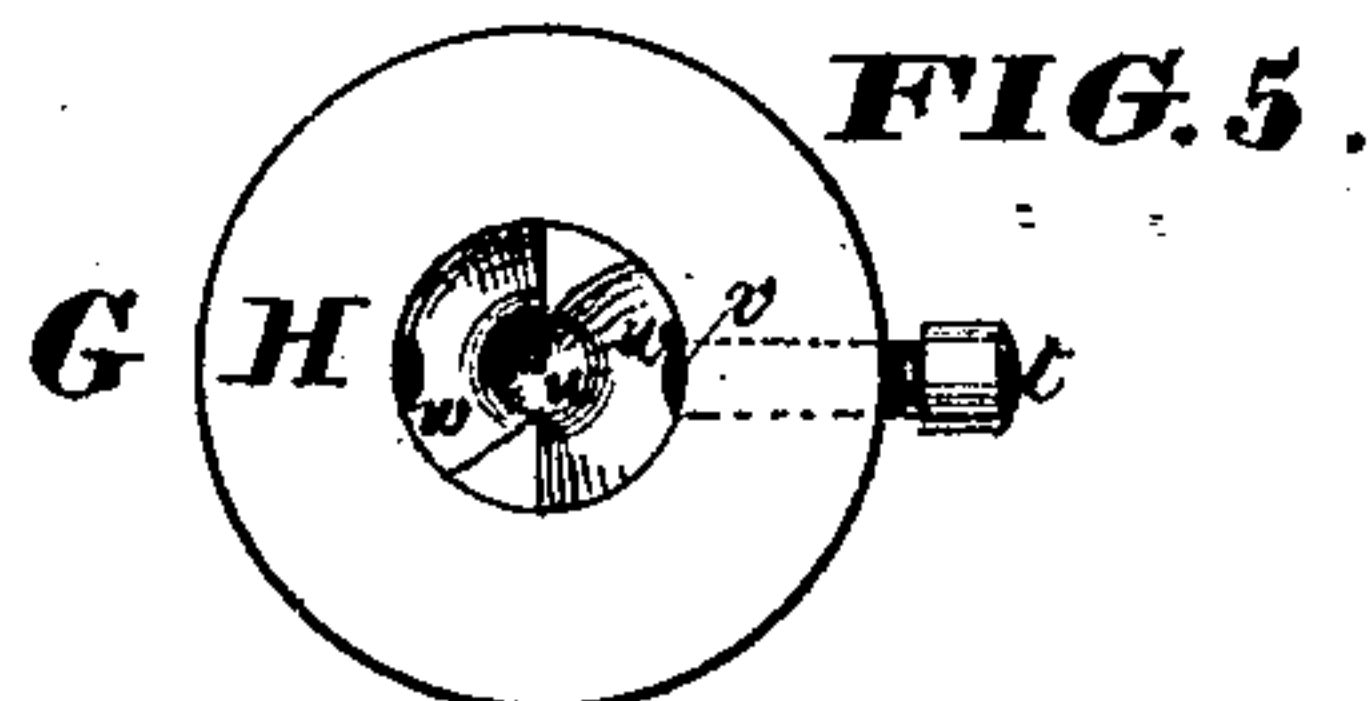
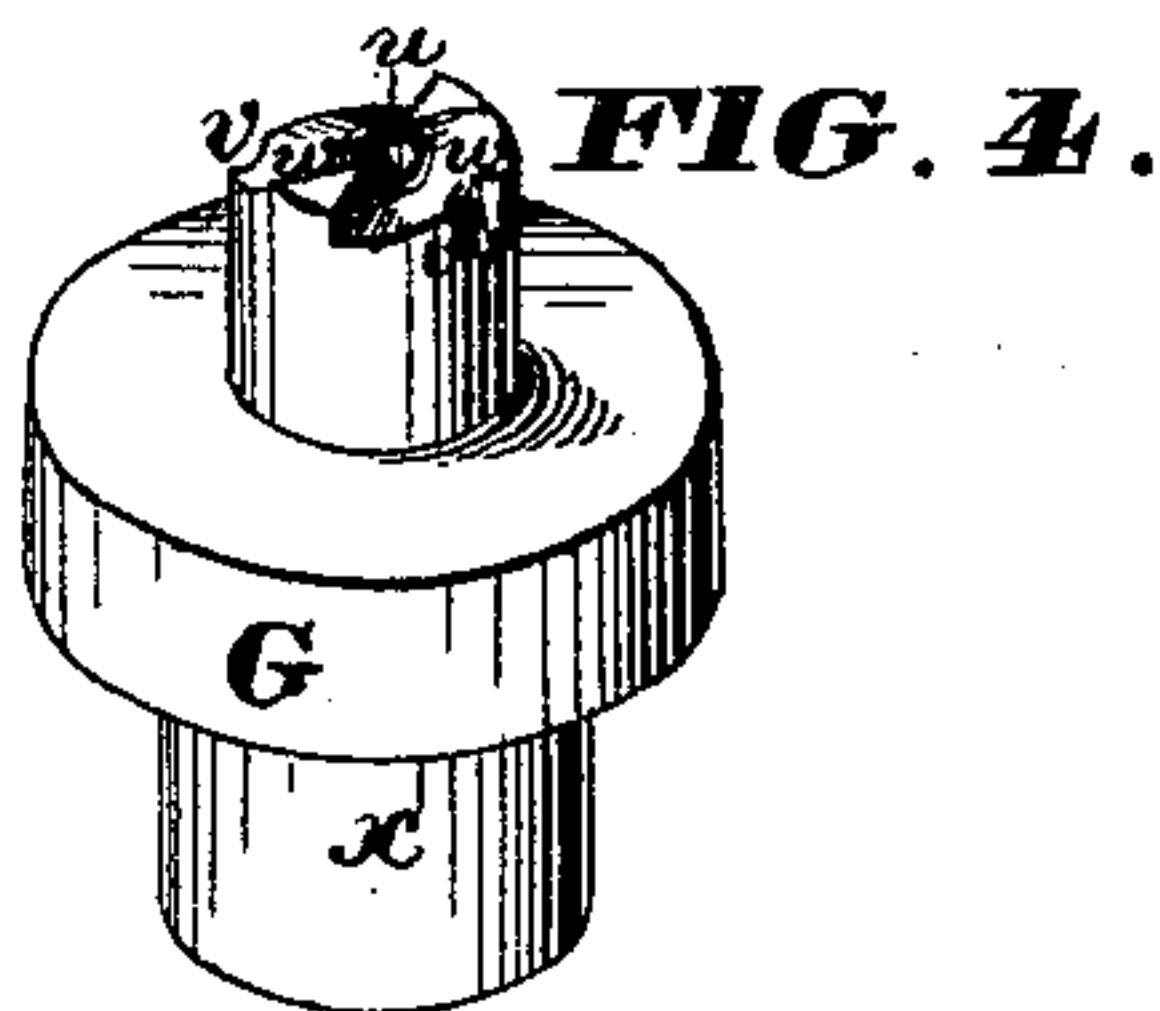
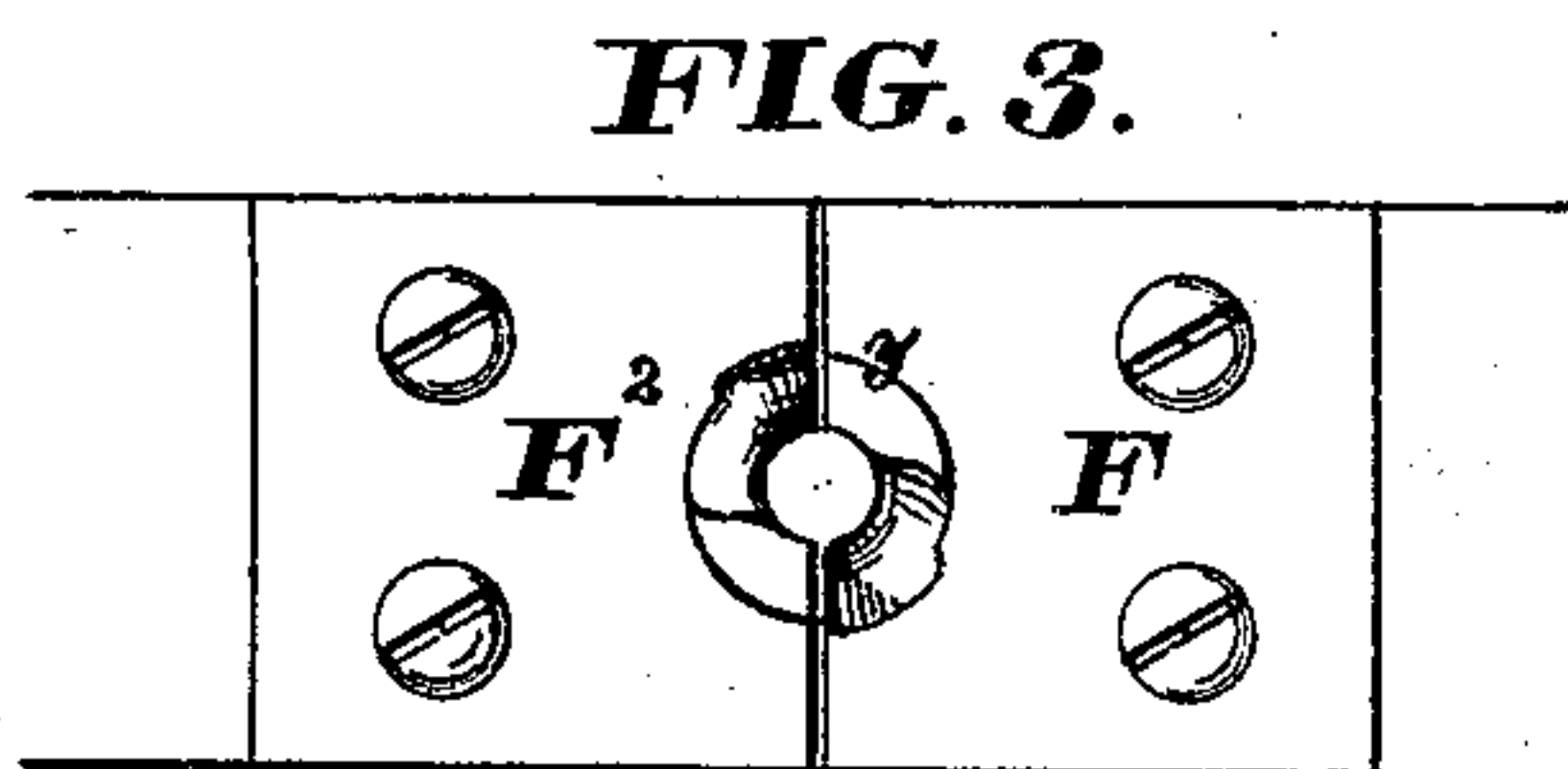
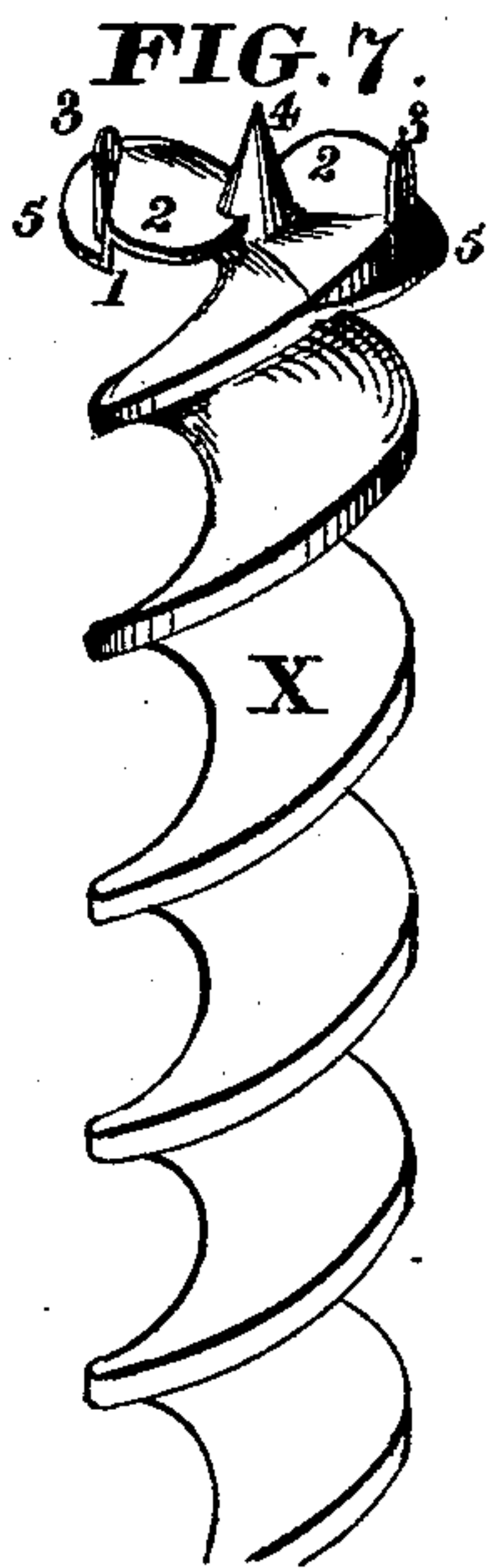
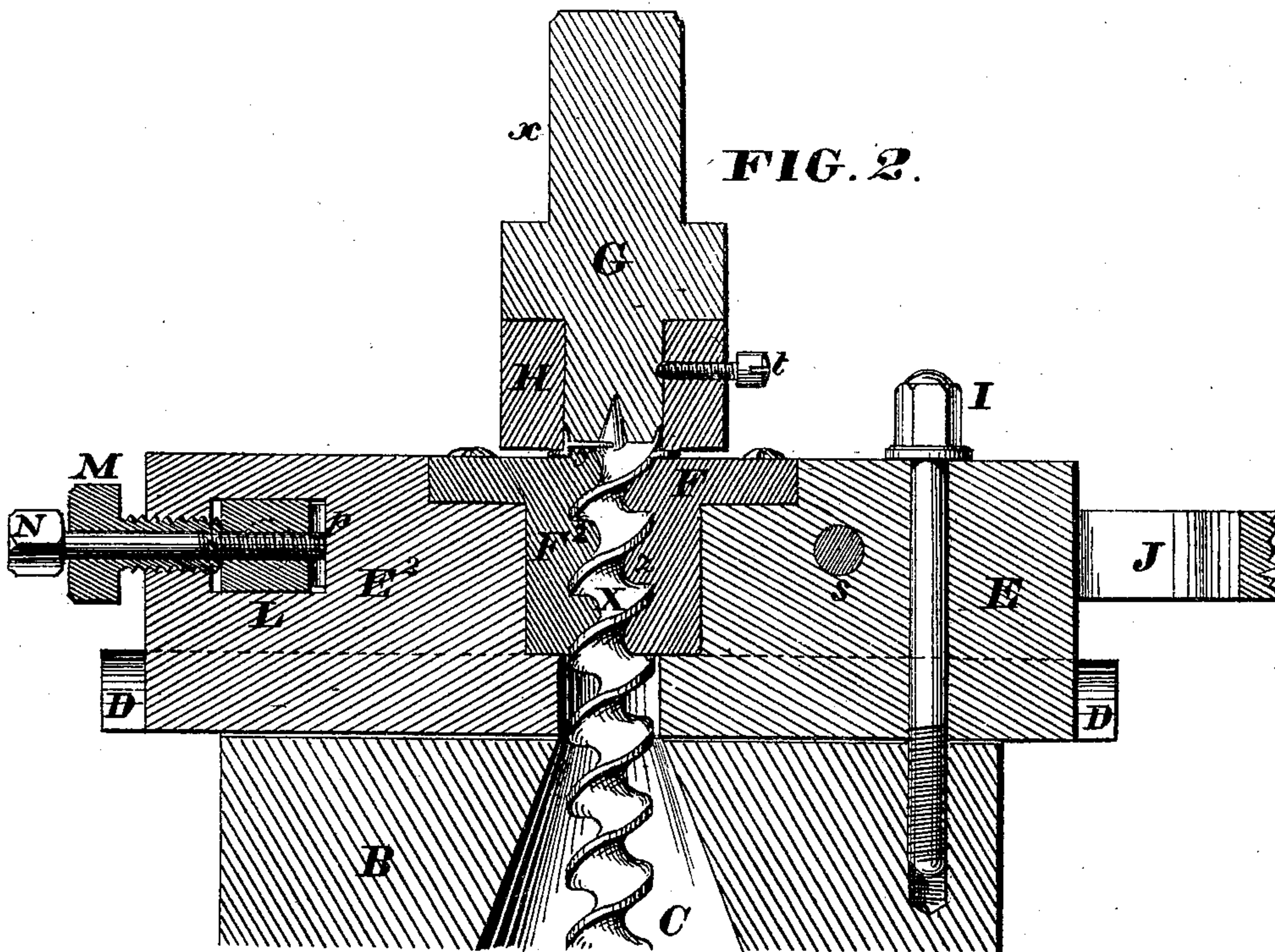
WITNESSES

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Walter Allen

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UNITED STATES PATENT OFFICE.

WILLIAM TUCKER, OF FISKEDALE, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR FORMING AUGER-BITS.

Specification forming part of Letters Patent No. 151,325, dated May 26, 1874; application filed April 16, 1874.

To all whom it may concern:

Be it known that I, WILLIAM TUCKER, of the town of Fiskedale and county of Worcester, in the State of Massachusetts, have invented certain Improved Apparatus for Forming the Cuts of Augers, of which the following is a specification:

This invention relates to means for forming the heads of augers and auger-bits with their screw-points and cuts; and it relates to that form of apparatus in which the heads are "dropped" or forged between dies in a drop-press.

The present invention consists in a certain combination of dies for forming the floor and side cuts, spurs, and screw-point of an auger or auger-bit complete at one blow, and with the flash transverse instead of longitudinal, by dropping the same endwise, as hereinafter set forth. The invention consists, further, in certain means for supporting, operating, and adjusting the lower dies, the upper die to be carried by the hammer or drop of the press, as hereinafter specified.

Figure 1 is a perspective view of the improved apparatus, excepting the upper die. Fig. 2 is a vertical longitudinal section, illustrating the operation. Fig. 3 is a plan of the lower dies. Fig. 4 is a perspective view of the upper die inverted, and with a portion removed. Fig. 5 is a face view of the upper die complete. Fig. 6 is an elevation of the blank of an auger-bit ready for the heading operation. Fig. 7 is a perspective view, representing the same with cuts and point as dropped in the present apparatus.

The base A of this apparatus is a heavy casting, of proper shape to be keyed into the bed or sow of a drop-press. Upon this base is erected an upright rectangular casting, B, having a recess, C, in one face, and termed the stock. This last casting needs to be of sufficient height to accommodate the length of auger to be operated on. The recess C receives the auger laterally, and affords room for handling and working the same by means of the tongs. The stock is mounted diagonally on the base A, so that the ways of the drop-press shall not interfere with the operation of the dies, while at the same time facility is afforded for putting in and taking out

the auger, the recess in the stock being only partially turned from the operator. Undercut longitudinal ways D are bolted on the horizontal top of the stock B, and these receive a pair of slides, E E², the inner ends of which support the lower dies F F², which are bolted thereto. The adjoining faces of these dies have vertical concavities, provided with the ordinary crimps, forming a spiral bore, z, so as to receive and support the twisted auger X between them. The top of the lower dies F F² is provided with segmental projections or anvils y, terminating the twists, the same being concentric with the bore z, and of the height of the required side cuts 1. The dies, as provided with these projections, are adapted to give the required inside impression to the end or head of the auger. The impression on the outer side or extreme end of the auger is imparted by an upper die, G, having a shank, x, by which it is keyed in the drop or hammer in line with the crimp-bore z and anvils y, and in proper position relatively to the latter. This die has in its face suitable spiral inclines w to form the floor-cuts 2 of the product, edge notches v to form the spurs 3, and a central depression, u, to form the screw-point 4. These matrical depressions and surfaces are readily formed on the end of a cylindrical projection of the same diameter as the head of the auger. A ring, H, is then applied to this projection, and secured in place by a set-screw, t. This ring supports the die against spreading, and constitutes a bruise to protect the dies from smashing together in those parts which are delicate and require to be kept in perfect shape. It serves also to form the outer surfaces of the side cuts 1 and spurs 2, more especially the former, which it produces by carrying down the metal over and around the anvils y on the lower dies, the anvils being made as much less in diameter than the hole in the ring as the required thickness of the side cuts, and the ring projecting the required length below the face of the upper die proper, as illustrated in Figs. 2 and 3. The auger being thus struck, the lower dies are locked together or spiked by the side cuts embracing the two parts of the anvil on the lower dies. To provide means for readily applying the requisite force to release the auger, as also for

clamping the same in the dies at the beginning of the operation, and for holding it during the operation, is the object of the next part of the invention.

The right-hand or front die-support E is simply slid into position, and is there secured by a vertical bolt, I. The die support or slide E² at the left and behind the other is not thus fixed, but is movable within the ways D. The bifurcated end of a strong hand-lever, J, embraces the fixed die-support E, and is attached thereto by a pivot-bolt, S, extending through the die-support from side to side. The pivot is located at the extremity of the legs of the lever, and the latter is adapted to occupy either a horizontal or a vertical position. At a proper distance from the pivot S one end of a link, K, is attached to each leg of the lever by a pivot, r, the other extremity of each link being attached to the movable die-support E² by pivots q. These last-named pivots constitute the ends of the yoke L, occupying a longitudinal recess, p, in the movable die-support, and adjustable therein by means of screws M N, to take up lash or wear. Of these the screw M is tapped into a hole in the rear end of the die-support E², so as to engage with the outer surface of the yoke L. The screw N passes axially through the screw M, the latter being hollow. It meshes with a threaded aperture in the yoke, and abuts against the inner end of the recess p, in which the yoke slides. By these means the pivots q can be positively adjusted, as required, and securely held as adjusted. Adjustable stops O, in the form of set-screws, are applied to the top of the stock, to support the lever in horizontal position, with the pivots in line so as to lock. In this position of the lever, the dies are tightly clamped together and supported against separation, as shown in Fig. 2, and in full lines in Fig. 1. In the vertical position of the lever, the movable die-support occupies a retracted position, the dies are opened, and the space between the dies is exposed, as illustrated by dotted lines in Fig. 1.

The base A having been keyed in the bed or sow, and the upper die G in the hammer of a drop-press, as above described, the handle of the lever J is thrown up to open the dies F F², and a hot blank, X, of the ordinary form, (represented in Fig. 6,) is introduced laterally into the recess C in the stock B, and adjusted in the stationary die F, so that the thread shall extend to or slightly above the top of the anvil projection y on the top of the dies. The dies are then immediately closed by a downward pressure on the lever J, and the auger or

blank is firmly clamped in position. The hammer is now permitted to descend, and the exposed end or head of the auger is struck by the upper die G and instantly formed, as hereinbefore set forth, and as clearly illustrated in Figs. 2 and 7. As soon as the hammer has struck its blow it is raised out of the way to its position for another stroke. The dies are now clinched or locked together; but a slight upward movement of the lever, imparting a powerful force to the movable die-holder, loosens the auger, which, being still red, is readily turned in the dies by means of the tongs sufficiently to clear the side cuts. The opening of the dies is now completed in an instant, the auger is withdrawn laterally, and a new blank is introduced, and so the operation goes on.

The fins or flash 5, it will be observed, is formed transversely at the extremity of the side cuts, and can consequently be sheared off with superior facility, while the point and spurs are left smooth by the dies.

Having described this my invention, I claim as new—

1. The dies F F² G, constructed and operating substantially as herein described, for forming the heads of augers and auger-bits having side cuts by dropping the same endwise.

2. The improved upper die G, for attachment to the hammer or drop, said die being constructed with the spiral inclines w, notches v, and central depression u, and provided with the ringer H, having a cylindrical interior, to form the outer surfaces of the side cuts and spurs, and to strengthen the die, and to constitute a bruise, substantially as herein shown and described.

3. The bifurcated hand-lever J and links K K, in combination with the pivots s r q and adjustable stops O, for opening and closing the dies, and for supporting them when closed, as set forth.

4. The quill-screw M and the screw N within the same, in combination with the recessed die-holder E² p, and the yoke L therein, carrying the pivots q, for taking up lash, in the manner set forth.

5. The combination of the base A, the diagonal stock B, having the recess C, the ways D D on the horizontal top of the stock, and the fixed and movable die-supports E E², with their appurtenances, substantially as herein shown and described, for the purpose specified.

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Witnesses:

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THOS. R. PHETTEPLACE.