

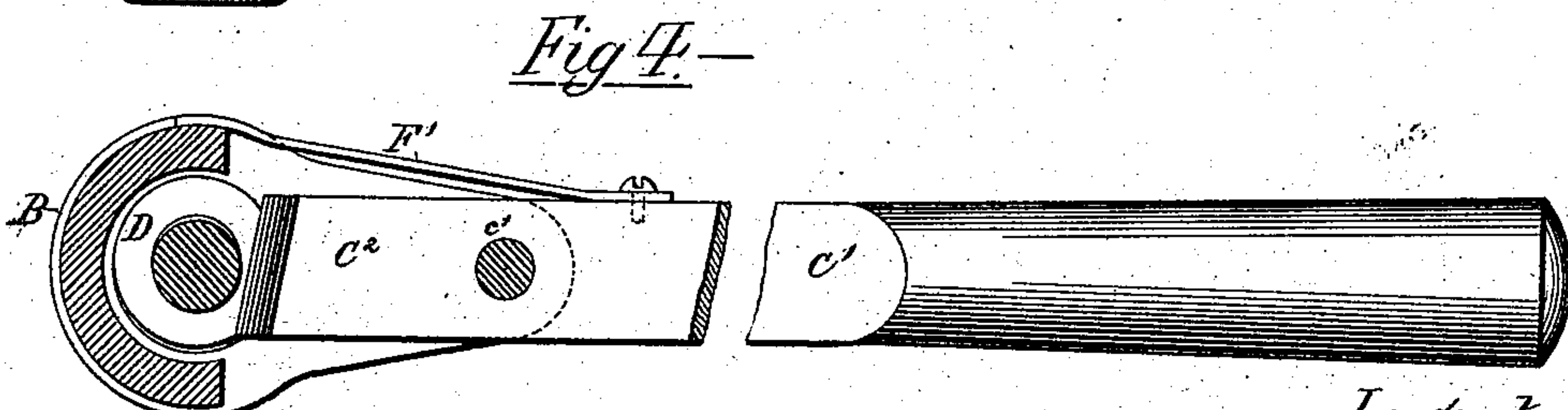
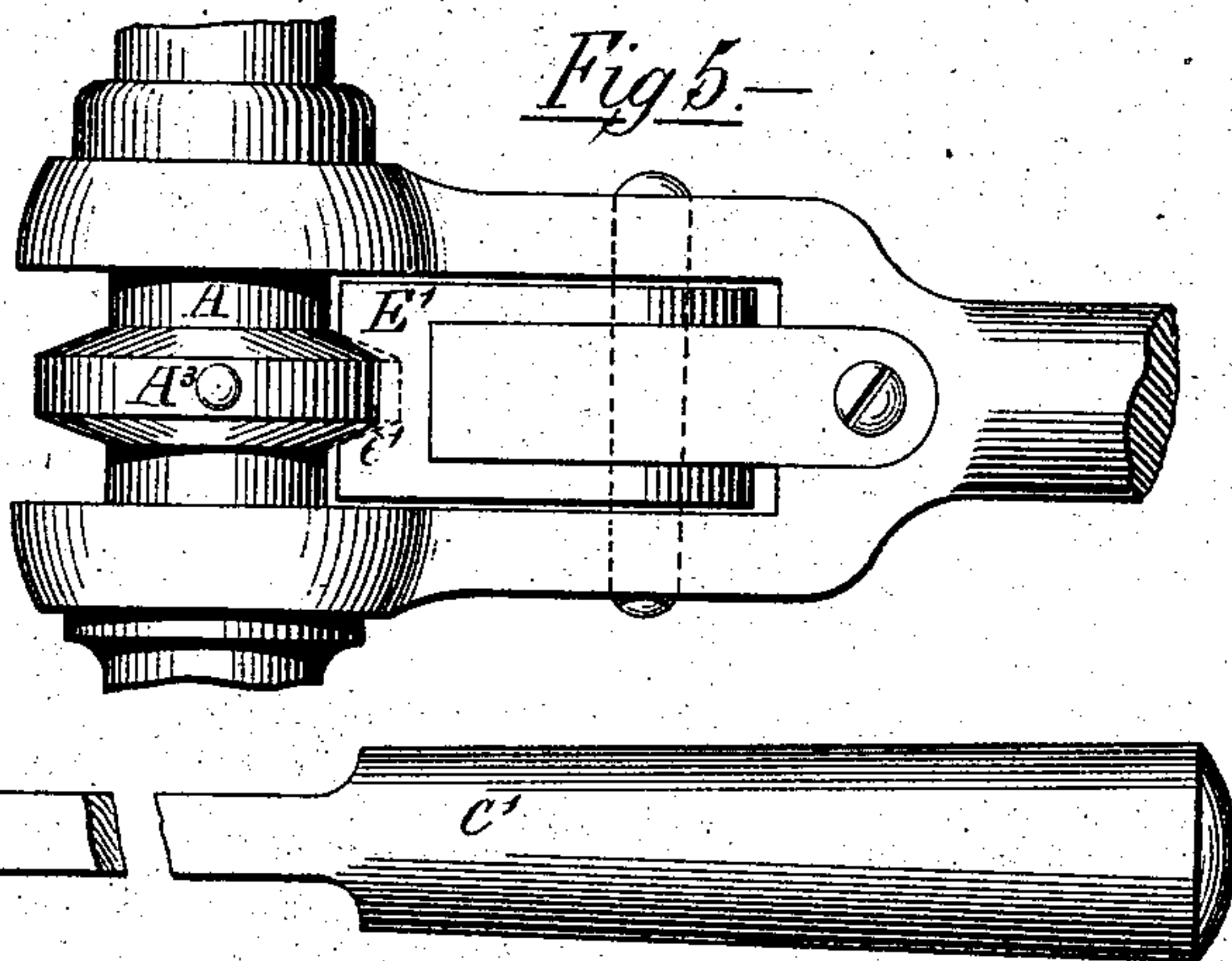
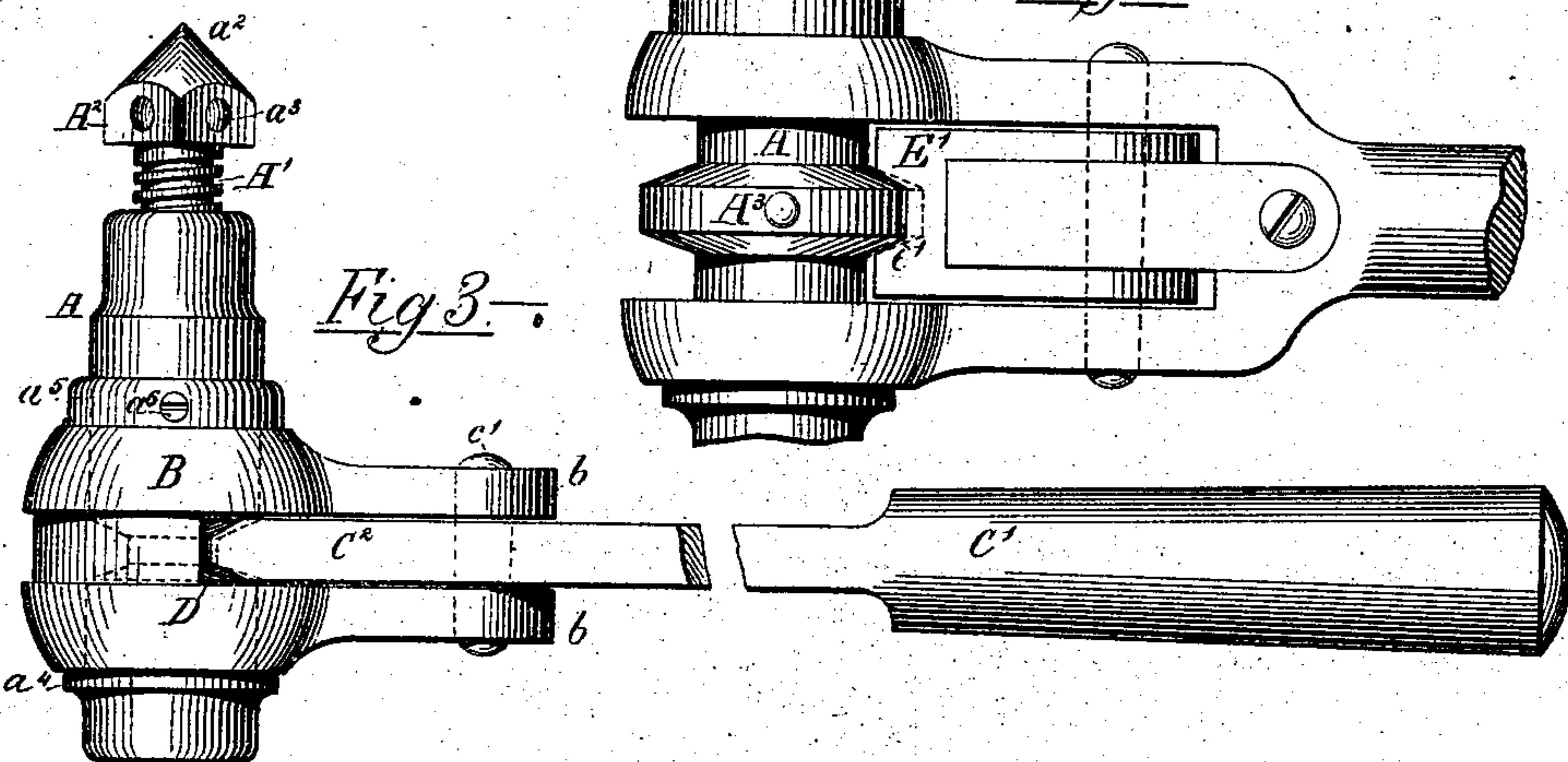
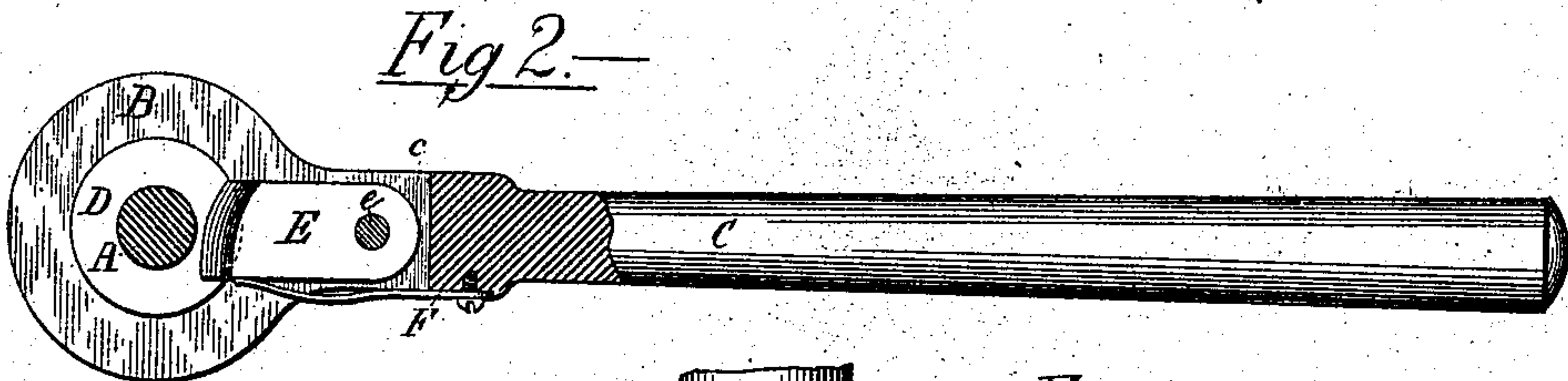
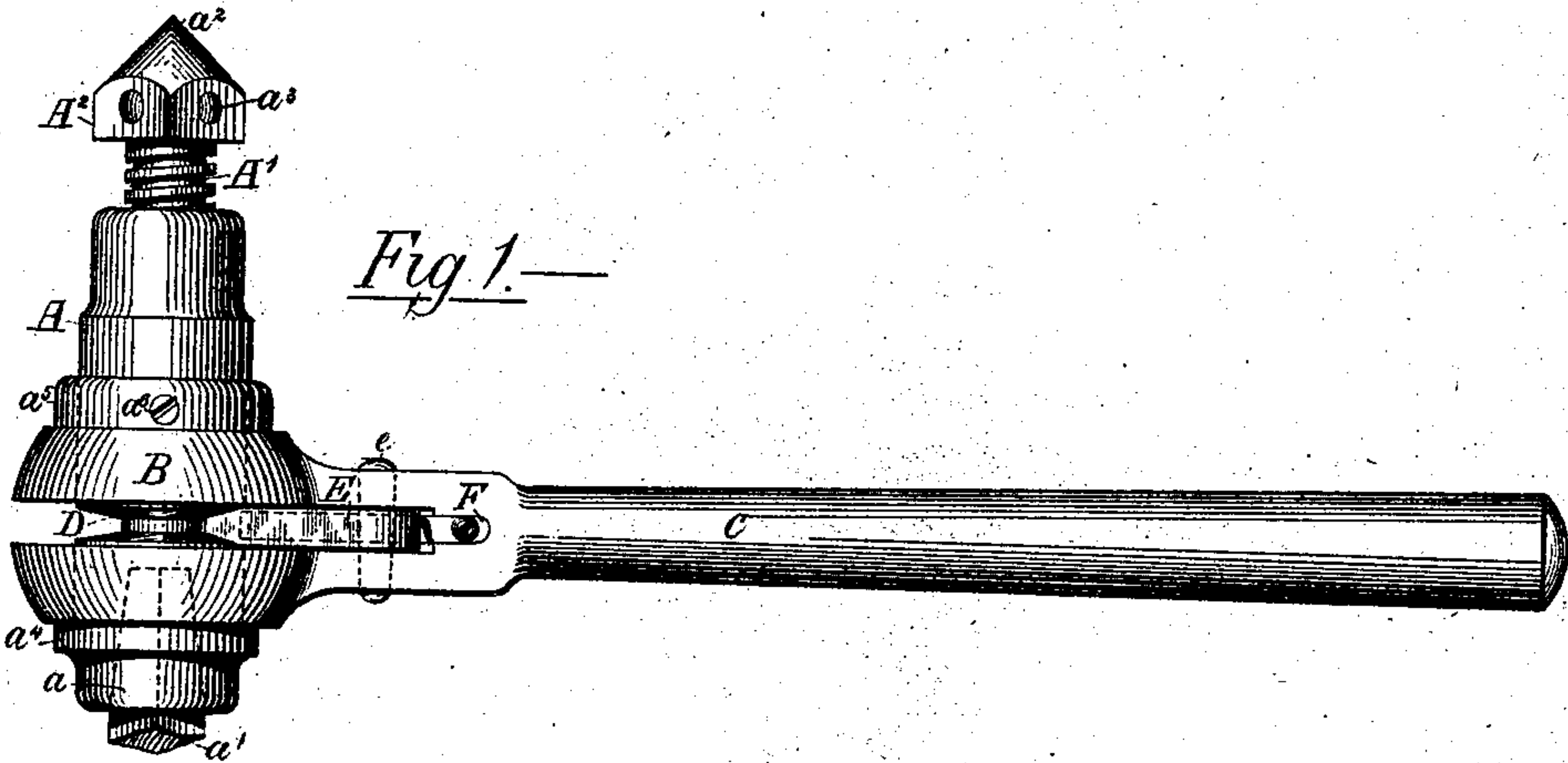
(No Model.)

J. L. SHORROCK.

DRILL BRACE.

No. 376,757.

Patented Jan. 24, 1888.



Witnesses—
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UNITED STATES PATENT OFFICE.

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DRILL-BRACE.

SPECIFICATION forming part of Letters Patent No. 376,757, dated January 24, 1888.

Application filed July 11, 1887. Serial No. 243,965. (No model.) Patented in England July 10, 1885, No. 8,359.

To all whom it may concern:

Be it known that I, JAMES LIGHTFOOT SHORROCK, of Accrington, in the county of Lancaster, England, have invented certain new and
5 useful Improvements in Hand-Drills or Tool-Carriers; 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
10 marked thereon, which form a part of this specification.

This invention relates to hand-drills of that class which comprise a revolving spindle or tool-holder, an oscillating arm or hand-lever
15 mounted to turn about said spindle or tool-holder, and means attached to the lever and acting upon the spindle in such manner as to turn the said spindle intermittingly in one direction when the hand-lever is oscillated.

20 The invention consists in the matters hereinafter described and pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a side elevation of a hand-drill or tool-carrier
25 embodying my invention. Fig. 2 is a sectional plan view of the same, taken upon line xx of Fig. 1. Fig. 3 is a side view of a hand-drill embodying the main or principal features of my invention and differing somewhat from the
30 form thereof shown in Figs. 1 and 2. Fig. 4 is a sectional view of the same, taken upon line xx of Fig. 3. Fig. 5 illustrates another form of device embodying the main features of my invention.

35 As illustrated in the said drawings, Figs. 1 and 2, A is the main part or spindle of the device.

B is a collar or apertured head mounted to turn upon the said shaft A, and C is a hand-
40 lever attached to the collar or head B. The said spindle A is provided at one end with a tool-socket, a , adapted to receive the shank of a bit or other tool which acts by rotation, the shank of said tool being indicated at a' .

45 A' is a screw-shaft having screw-threaded engagement with an axial aperture of the spindle A, and provided with a conical bearing-point, a^2 , and with a flat-sided head, A^2 , provided with holes a^3 for a turning pin. The
50 bearing-pin a^2 of the screw-shaft A' is in the

use of the tool placed against a suitable bearing or support, and the said shaft is turned to feed the tool forward to its work in a manner heretofore common and well understood.

The sleeve or head B is held in place upon
55 the shaft A by means of two collars, a^4 a^5 , thereon, the collar a^5 being herein shown as removable and secured in place by a set-screw, a^6 , to allow the said bearing or head to be placed
60 on or removed from the spindle. The spindle A is provided at a point adjacent to the collar or bearing B with a groove, D, having inwardly tapering or converging side walls, and upon
65 the said collar or bearing is pivoted a swinging block or pawl, E, the free end of which enters the said groove D and is tapered upon its sides to correspond with the taper of the side walls
70 of the groove. The said swinging block or pawl E is made of such length, or is pivoted at such point, that when the lever C is moved in one direction the end of the pawl will be
75 drawn freely through the groove D, and when the lever is swung in the opposite direction the end of the pawl will be caught or pinched in the groove, and the spindle A thereby caused
80 to move or turn with the lever. For the purpose of insuring the engagement of the said pawl or swinging block E with the groove a spring, F, is attached to the lever C in position
to bear upon the pawl or block near its free
end, in the manner clearly shown in Fig. 2.

The groove D and pawl E may be disposed at any suitable point upon the head or collar B and the spindle. As herein shown, how-
85 ever, the said groove D is placed midway of the bearing-surface of the spindle between the collars a^4 a^5 , and the pawl E is placed in a recess or slot formed in the head or collar B mid-
way of the thickness of the latter, the said
90 pawl being sustained upon a pivot-pin, e , held at its ends in the side walls of the said slot or recess in the manner clearly shown in Fig. 1.

A tool holder or drill made as above described is used in the same manner as the ordinary ratchet-drill heretofore employed, the
95 tool being operated by swinging or oscillating the lever C, while the drill is held to its work by suitable pressure applied endwise to the spindle A. When the said lever C is thrust
100 backwardly, the beveled end of the pawl E

moves freely through the groove D; but in the forward movement of the lever the end of the pawl is pinched or caught between the opposite inclined or tapered walls of the groove, and the spindle is thereby caused to turn with the lever. By making the groove of wedge form or tapering inwardly in the manner described and the end of the pawl of corresponding shape, the said pawl is firmly gripped in the groove, giving to the pawl a bite or hold upon the spindle impossible to obtain with a similarly-arranged pawl acting upon a cylindrical surface.

A tool constructed and operating in the manner described has a great advantage over the ratchet-drills heretofore used, for the reason that the friction gripping device illustrated comes into engagement at the moment the direction of motion of the hand is reversed in oscillating it, so that there is no lost motion such as occurs in a ratchet-drill, in which the pawl, if carried past one tooth, must slip back to that tooth before any movement of the spindle takes place.

In Figs. 3 and 4 I have shown a modification of the main or central feature of my improved tool-carrier. In this instance A is the spindle, and B a head or collar mounted to rotate thereon in the same manner as before described. In this instance a hand-lever, C', is employed, which, instead of being rigid with the collar or head B, is pivoted thereto. Said lever is in this instance provided with an arm or projection, C², extending inwardly from its pivotal axis and beveled at its end and adapted to enter the groove D, so that such arm or projection C² takes the place of the separate pawl or swinging block E. (Shown in Figs. 1 and 2.) A spring, F', is in this instance applied to swing the lever C about its pivot in such direction as to carry the end of the part C² thereof into engagement with the groove D.

The operation of this form of the device is practically the same as that of the tool shown in Figs. 1 and 2, the end of the projection C² being jammed into the groove D when the hand-lever is drawn toward the operator, with the effect of turning the spindle A with the lever, while the backward movement of the said lever releases the said part C² from the groove and allows the lever to swing backwardly without moving the said spindle. The groove D shown in Figs. 3 and 4 is located at a point midway of the bearing-surface of the head B, the lever C being mounted on a pivot-pin, c, inserted through to projecting arms or lugs b upon the said head B.

The main feature of my invention is embraced in a construction in which frictional engagement between a pivoted arm, block, or pawl carried by the hand-lever of the tool and the tool-spindle is produced by means of engaging-surfaces made tapering or wedge-shaped, with the result above set forth. As far as this result is concerned, however, the parts may be arranged otherwise than as above

described. As, for instance, I have shown in Fig. 5 a construction of the parts in which is substituted for the groove D and pawl E, arranged to enter the groove, the equivalent construction in which the groove is formed in the pawl or movable part and the projection engaging the groove is located upon the spindle. In said Fig. 5 the spindle A is provided with a projecting rib or flange, A³, having outwardly-tapering side faces; and a pawl, E', is employed, having a notch, e', in its end, adapted to fit over the said rib or flange A³. It will be observed, furthermore, that the advantages gained by the particular construction of the gripping-surfaces of the pawl and spindle above described are present in the construction shown in Figs. 3 and 4, in which the arm or pawl is made integral with the lever, as well as when the pawl is pivoted separately to the lever or the bearing-head to which it is attached. The appended broad claim is intended therefore to cover the main features of construction above referred to when the pawl is mounted or supported in or upon the bearing-head or lever in accordance with either of the particular plans shown or otherwise. It is to be understood, furthermore, that my invention embraces a hand-drill or tool-carrier having one or more than one pawl or swinging block for engagement with the spindle, and that the groove or notch of the spindle or pawl may be of other cross-sectional shape than the particular one shown, provided the side walls thereof are shaped to converge or taper inwardly, in the manner above stated.

As a further and special improvement upon tools of the character herein shown, I make the annular engaging-surface upon the spindle somewhat eccentric to the axial line of the spindle, as shown in Figs. 3 and 4. By this construction the tongues bite at different points during each revolution, whereby said tongues are rendered more lasting and durable.

The embodiment of the main features of my invention first above described and shown in Figs. 1 and 2 is, for some reasons, preferable to that shown in Figs. 3, 4, and 5, and the particular features of construction illustrated in said Figs. 1 and 2 are therefore made the subject of a specific claim herein.

I claim as my invention--

1. A hand-drill or tool-carrier comprising a tool-holding spindle, a hand-lever mounted to turn about the said spindle, and a pivoted arm or pawl connected and moving with the hand-lever, said spindle and the arm or pawl being provided with engaging-surfaces made tapering or wedge-shaped, substantially as and for the purpose set forth.

2. A hand-drill or tool-carrier comprising a tool-holding spindle, a head or collar mounted upon the spindle, a hand-lever rigidly attached to the head or collar, and an arm or pawl pivoted upon said head or collar, said spindle being provided with a groove having inwardly

tapering or converging side walls for engagement with the free end of the said arm or pawl, substantially as described.

5 3. A hand-drill or tool-carrier comprising a tool-holding spindle, a hand-lever mounted to turn about said spindle, and a pivoted arm or pawl connected with the hand-lever, said spindle being constructed with eccentric annular grooves tapered or wedge-shaped for engagement with correspondingly tapered or wedge-

shaped portions of the said pivoted arm or pawl, substantially as described.

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

JAMES LIGHTFOOT SHORROCK.

Witnesses:

JOHN LIGHTFOOT SHORROCK,
JOSEPH HOWARTH.