E. GAIRING.

BORING TOOL.

APPLICATION FILED NOV. 10, 1917.

1,298,196.

Patented Mar. 25, 1919.

Fig. 1.

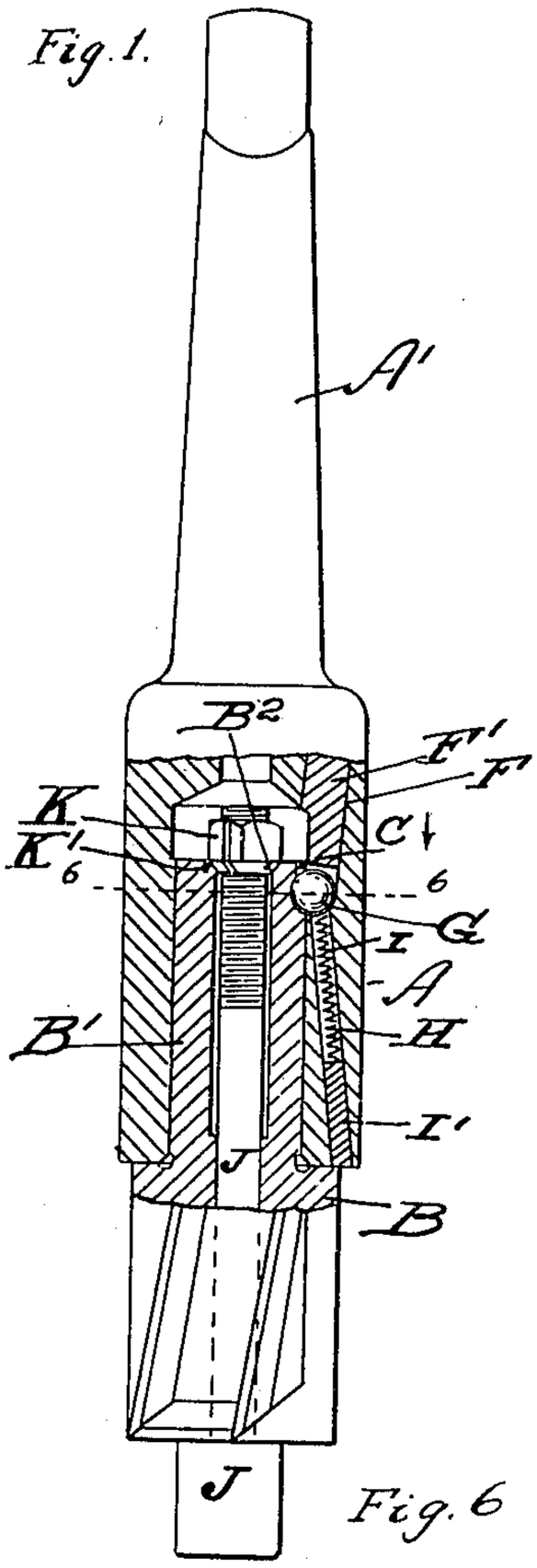


Fig. 6.

Fig. 2.

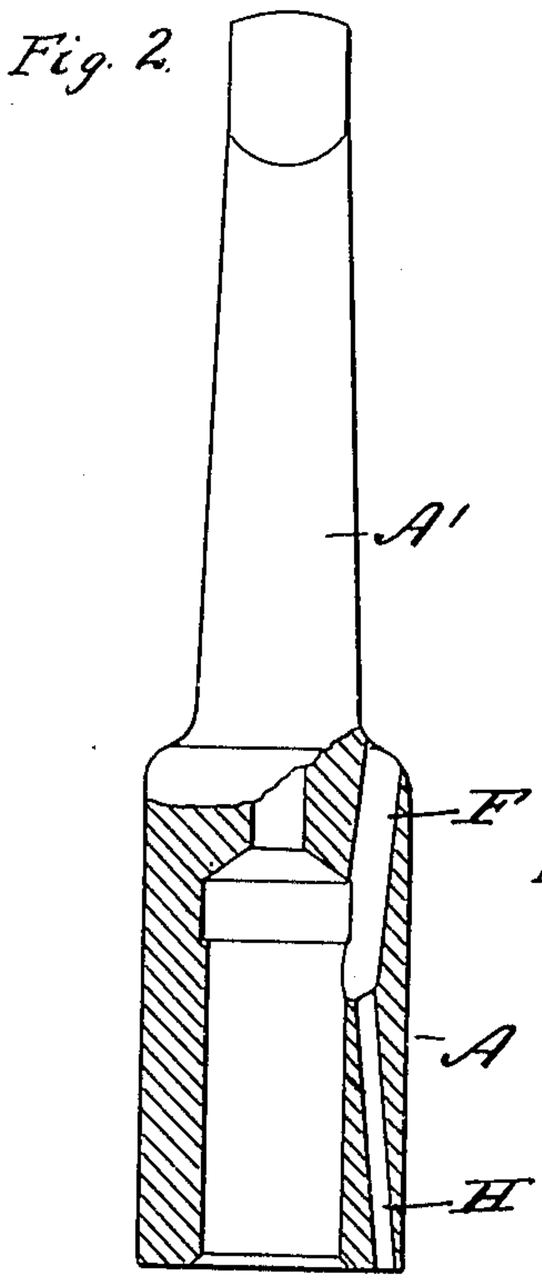


Fig. 5

Fig. 3.

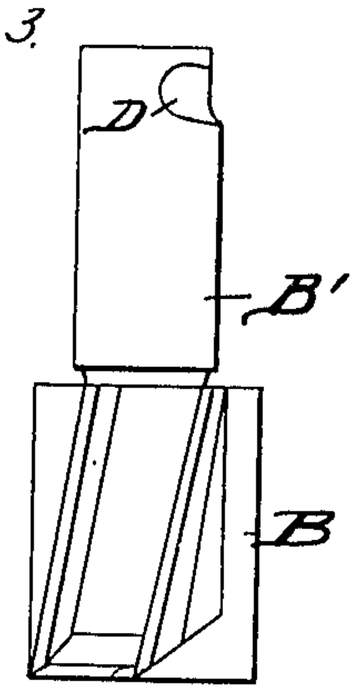
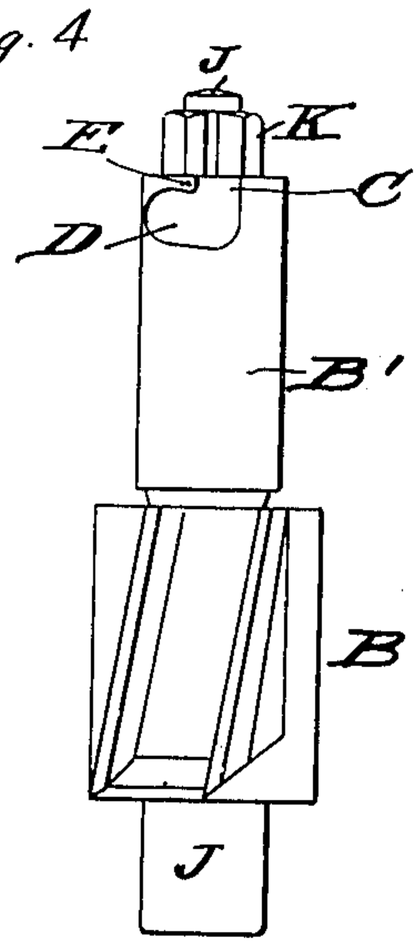


Fig. 4



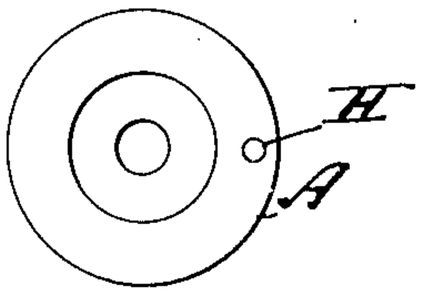
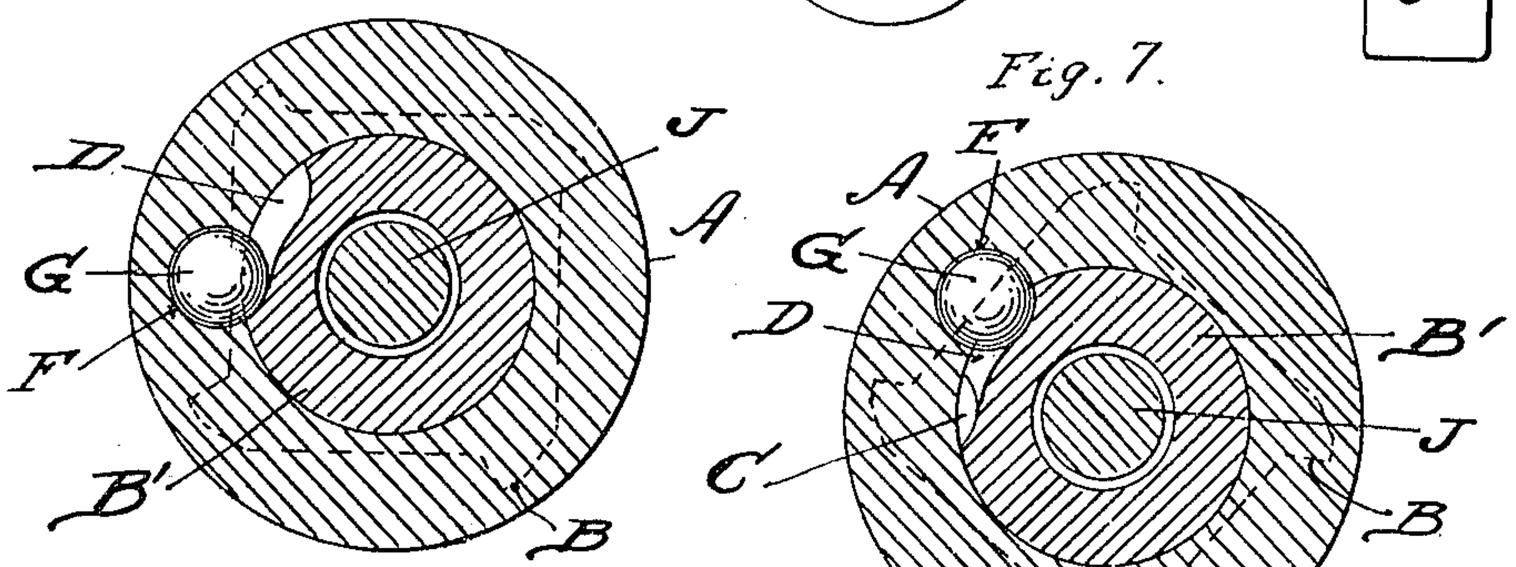


Fig. 7.



Witness

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UNITED STATES PATENT OFFICE.

EMIL GAIRING, OF DETROIT, MICHIGAN, ASSIGNOR TO THE GAIRING-NEEDHAM TOOL CO., INC., OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

BORING-TOOL.

1,298,196. Specification of Letters Patent. Patented Mar. 25, 1919.

Application filed November 10, 1917. Serial No. 201,207.

To all whom it may concern:

Be it known that I, EMIL GAIRING, citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Boring-Tools, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to boring tools and especially counterboring tools shown in the accompanying drawings and more particularly pointed out in the following specification and claims.

One object of this invention is to provide means adapted to securely hold a drill or other tool in its socket, not only when the tool is in operation, but against accidental release when at rest, the construction being such however that it may be readily removed when required.

Another object of this invention is to provide a construction in which the locking means is concealed entirely within the socket eliminating all peripherally mounted spring actuated detent holding devices or other locking means projecting externally from the socket member as commonly employed in tools of this character and which frequently injure the hands of the operator.

Another object of the invention is to provide means adapted to automatically lock the tool in the socket and to maintain the same in locked relation therewith until manually released.

Another object of the invention is simplicity of construction and operation and comparative inexpensive manufacturing cost.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes may be made in the precise embodiment of the invention hereinafter disclosed without departing from the spirit of the same.

In the accompanying drawings forming part of this specification:—

Figure 1 is a side elevation of a tool and socket with parts broken away and in section showing the construction of the locking mechanism.

Fig. 2 is a side elevation partly in section of the socket.

Fig. 3 is a side elevation of the tool.

Fig. 4 is a side elevation of the tool as viewed when rotated about 90° from the preceding view showing a pilot rod in position.

Fig. 5 is an end elevation of the socket.

Fig. 6 is a cross sectional view through the socket, tool and pilot rod taken on line 6—6 of Fig. 1, looking in the direction indicated by the arrow and showing the tool as it would appear when first inserted in the the socket before being locked therein—the locking ball being in the peripheral axial groove of the tool.

Fig. 7 is a similar sectional view indicating the tool locked in the holder by the ball which is now shown lodged in the transverse peripheral groove of the tool due to the operation of the latter.

Referring now to the letters of reference placed upon the drawings—

A, denotes a socket provided with a tapering shank A′, adapted to be inserted in a suitable chuck or other driving means (not shown).

B, indicates a boring tool having a shank B′, designed to enter the socket A, and having a short axial groove C, extending from the end of the shank toward the cutting end of the tool, from which opens a transverse peripheral groove D, having a slight upward inclination, as clearly indicated in Fig. 4 of the drawings;—forming a sharply rounded and slight downwardly directed corner E, between the axial and transverse grooves, the purpose of which will be hereafter explained.

F, indicates a downwardly directed inclined hole bored from the shoulder in the member A, toward its socket in which is lodged a ball G, which partially seats itself in the axial groove C, of the tool shank when the latter is inserted in the holder.

F′, denotes a solder or other plug closing the upper end of the hole F.

H, indicates an inclined hole of relatively small diameter extending upwardly from the lower edge of the socket member A, and opening into the hole F, directly below the

seat of the ball G. I, designates a spring in the hole H, the action of which serves to slightly lift the ball G, from its seat. I′, indicates a solder or other plug closing the lower end of the hole H, against which the spring I, bears. J, denotes a pilot rod having an enlarged head bearing against the end of the tool, its upper end being fitted with a split nut K, having a screw threaded engagement with the end of the pilot rod.

The lower edge of the nut K, is chamfered, as indicated at K′, and is seated in the tapering recess B^2, in the end of the tool shank.

It will now be seen that when the nut is adjusted to secure the pilot rod to the tool, the tapering recess or socket in the end of the shank serves to compress the split nut into locked relation with the pilot rod, thereby securing the latter against accidental release.

Having indicated the several parts by reference letters, the construction and operation of the device will be readily understood.

To lock the tool in the holder the shank of the tool is first inserted in the socket of the holder so that the ball G, carried by the socket member may project into the axial groove C, of the tool shank. Upon the tool being operated, the ball enters the transverse peripheral groove D, connected with the axial groove, thereby locking the tool in the socket member. It will be noted that the transverse peripheral groove has an upward inclination, the object of which is to prevent the accidental release of the tool:—the downwardly directed rounded corner E, at the top of the groove serving to maintain the ball in its locked relation to the tool but not interfering with the ready manual withdrawal of the tool from the socket when required.

So also the spring I, serves to yieldingly lift the ball,—when the tool is turned that the ball may pass into the transverse peripheral groove beyond the downwardly directed rounded corner E,—that it may be maintained in the transverse groove against accidental dislodgment until manually released.

Having thus described my invention what I claim is:—

1. In a device of the character described, a tool supporting member provided with a socket to receive a tool shank and having an inclined bore opening into the socket to receive the ball, a ball lodged in said bore and having a limited upward and downward movement, a tool having a shank fitting said socket member, having an axial groove adjacent its upper end to admit the entry of the tool shank in the socket of the supporting member past the projecting ball carried thereby, and with a transverse peripheral groove connected with the axial groove to receive the projecting portion of the ball upon the rotation of the tool in the supporting member to secure it in locked relation thereto, and means carried by the said supporting member to urge the ball upwardly in the axial groove when the tool is in unlocked relation.

2. In a device of the character described, a tool supporting member having a socket to receive the shank of a tool and a downwardly directed bore in its wall opening into said socket, a ball lodged in said bore and having a limited upward and downward movement, said tool supporting member also provided with a bore in its wall below the ball to receive a spring, a spring lodged in said last named bore adapted to act upon the ball to urge the latter upwardly, a tool having a shank fitted to the socket of the tool supporting member provided with an axial and a connecting transverse peripheral groove to receive the projecting portion of the ball lodged in the tool supporting member, whereby the tool shank may be locked in driving relation with the tool supporting member upon rotation of the tool in the driven direction or released therefrom upon the manual rotation of the tool in a reverse direction.

3. In a device of the character described, a tool supporting member having a socket to receive the shank of a tool and an inclined downwardly directed bore in its wall opening into the socket, a ball lodged in said bore adapted to project into the socket and having a limited upward and downward movement, a plug to close the bore above the ball, said tool supporting member also provided with a relatively smaller bore below the ball to receive a spring, a spring lodged in said last named bore adapted to act upon the ball to urge the latter upwardly, a tool having a shank fitted to the socket of the tool supporting member provided with a relatively short axial and a connecting transverse peripheral upwardly inclined groove to receive the projecting ball lodged in the tool supporting member, whereby the tool may be locked in said supporting member or released therefrom by a slight forward or reverse rotary movement of the tool.

4. In a device of the character described, a tool supporting member having a socket to receive a tool shank and an inclined downwardly directed bore in its wall opening into the socket, a ball lodged in said bore adapted to project into the socket and having a limited upward and downward movement, a plug closing the bore above the ball, said member also having a relatively smaller bore in its wall below the ball inclined toward the socket opening, a spring lodged in said last named bore adapted to act upon the ball to urge the latter upwardly, a plug closing the bore below the

spring, a tool having a shank fitted to the socket of the supporting member provided with an axial and a connecting transverse upwardly inclined peripheral groove, the wall at the juncture of the axial and transverse grooves having a downwardly directed rounded corner adapted with the cooperation of the spring to maintain the ball in the transverse groove of the tool shank when lodged in the supporting member and until manually released therefrom.

In testimony whereof, I sign this specification in the presence of two witnesses.

EMIL GAIRING.

Witnesses:
S. E. THOMAS,
JOHN CONSIDINE, Jr.