Dec. 4, 1923. 1,476,386

J. C. WILLIAMS

BREAST DRILL

Filed Sept. 13, 1922 2 Sheets-Sheet 1

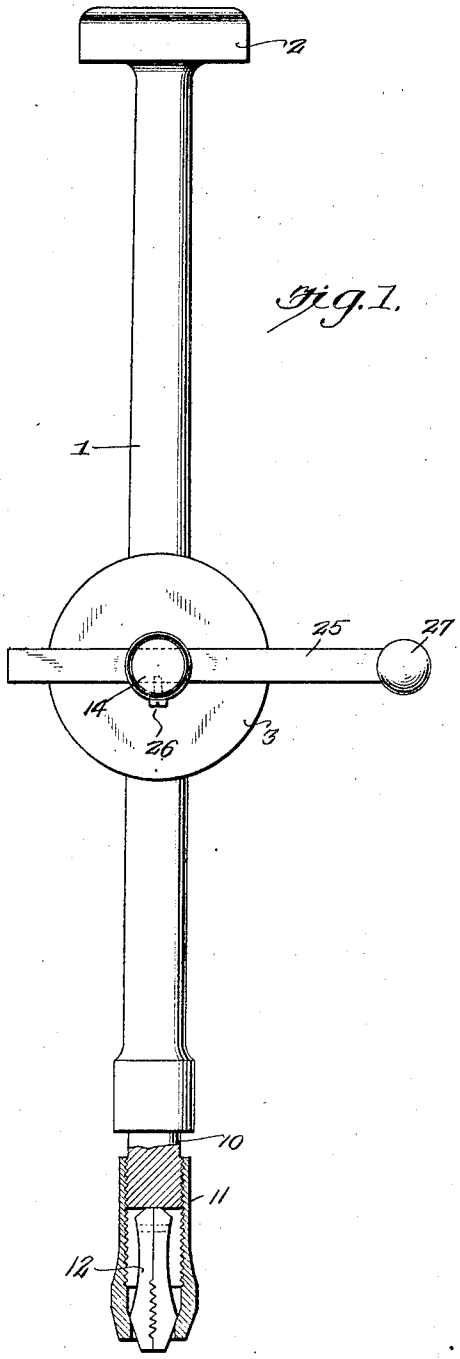

Fig. 1.

Fig. 3.

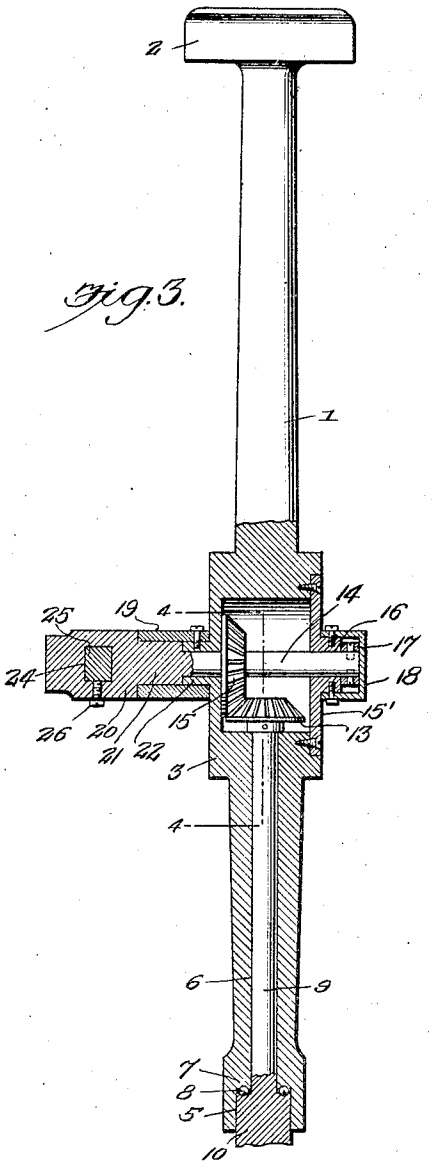

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Fig. 2.

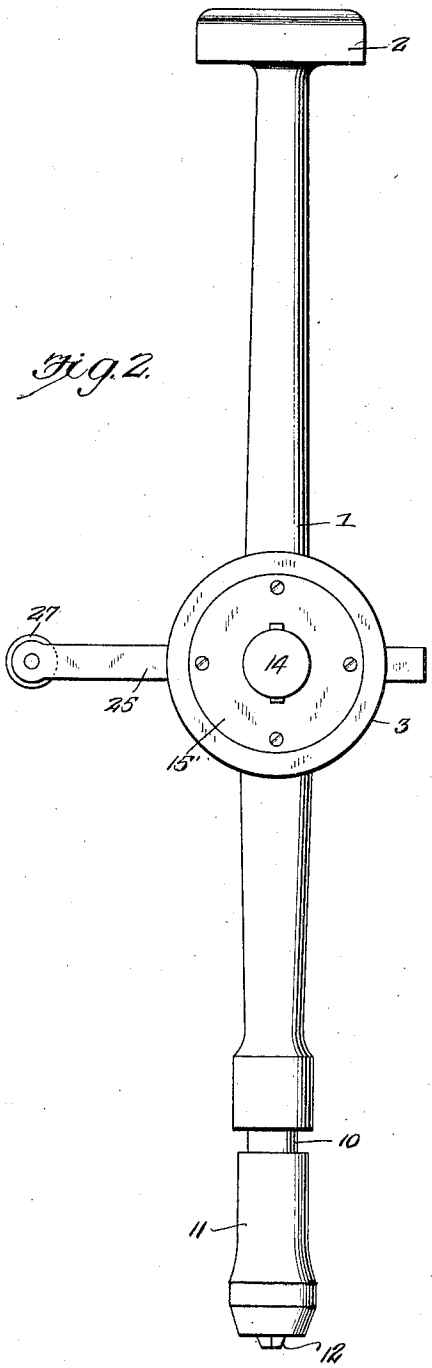
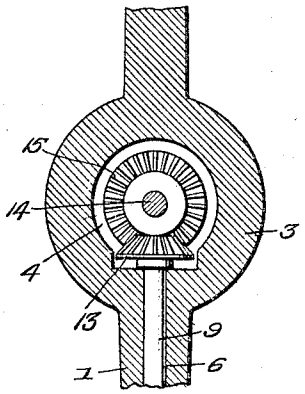


Fig. 4.



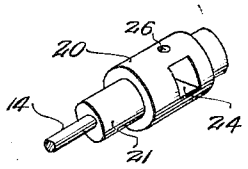


Fig. 5

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UNITED STATES PATENT OFFICE.

JOE C. WILLIAMS, OF FERDA, ARKANSAS.

BREAST DRILL.

Application filed September 13, 1922. Serial No. 587,983.

To all whom it may concern:

Be it known that I, JOE C. WILLIAMS, a citizen of the United States, residing at Ferda, in the county of Jefferson and State of Arkansas, have invented certain new and useful Improvements in Breast Drills, of which the following is a specification.

This invention relates to breast drills and it consists in the novel features hereinafter described and claimed.

An object of the invention is to provide a drill of the character stated which is of simple and durable structure and which includes an anti-friction ball bearing provided between the body or stock of the drill and the head of the shaft which carries the bit clamping jaws.

A further object of the invention is to provide a drill of the character stated which may be effectually used as an auger for drilling or boring holes of major diameter and may also be used to advantage for performing other and similar heavy work.

With these objects in view the drill comprises a stock provided at one end with a head adapted to bear against the breast of the operator when the drill is being used. The stock is provided at a point between its ends with a socket portion which is spaced sufficiently from the head to permit one hand of the operator to grasp the stock at a point between the head and the socket portion and hold the stock in position against the breast. The lower or other portion of the stock is provided with a bore which leads from the socket to a ball race socket located at the extreme outer end of the stock.

A shaft is journaled in the said bore and is provided with a head which is partially received within the ball socket and bearing balls are located in the race of the ball socket and interposed between the surface of the race and the end of the head of the said shaft. The bit clamping mechanism, of usual pattern, is mounted upon the head of said shaft.

The inner end of the said shaft enters the socket at the intermediate portion of the stock and is provided with a beveled pinion which meshes with a similar pinion mounted upon a shaft journaled in the said socket and disposed transversely of the length of the stock. A crank handle is adjustably mounted upon the last mentioned shaft.

In the accompanying drawings:—

Figure 1 is a side elevation of the drill with parts thereof shown in section.

Figure 2 is a side elevation of the drill viewing the same at the side thereof opposite that side which is shown in Figure 1.

Figure 3 is a fragmentary side elevation of the drill viewing the same at a right angle to the views shown in Figures 1 and 2 and with parts broken away and shown in section.

Figure 4 is a fragmentary sectional view of the drill taken on the line 4—4 of Figure 3.

Figure 5 is a fragmentary perspective view of a part used in the drill.

As illustrated in the accompanying drawings the drill comprises a stock 1 which is in the general form of a post or column and which is provided at one end with a head 2 adapted to bear against the breast of the operator when the drill is being used. The stock 1 is provided at a point between its ends with an enlarged portion 3 having a socket or cavity 4. The stock 1 is provided at its outer end with a socket 5 and a bore 6 extends from the socket 5 to the socket or cavity 4. The inner wall 7 of the socket 5 forms a ball race for bearing balls 8. A shaft 9 is journaled in the bore 6 and is provided at its lower or outer end with a head 10, part of which is received in the socket 5. The balls 8 are interposed between the inner end of the head 10 and the race 7 and serve as means for reducing friction between the parts when the drill is being used and thrust strain is applied to the shaft 6. A ferrule 11 is screwed upon the lower portion of the head 10 and carries bit clamping jaws 12 of usual pattern. A beveled pinion 13 is mounted at the upper or inner end of the shaft 9 and is located in the socket or cavity 4 of the enlarged portion 3.

A shaft 14 is disposed transversely of the stock 1 and extends centrally through the socket or cavity 4. A beveled pinion 15 is mounted upon the shaft 14 and meshes with the teeth of the pinion 13 mounted upon the shaft 9. A plate 15 closes the outer end of the cavity 4 and the shaft 14 passes centrally through the said plate at the bearing 16. A collar 17 is attached to the end of the shaft 14 and bears against the outer end of the bearing 16. A cap 18 is attached to the bearing 16 and receives the collar 17 and en-

closes the adjacent end portion of the shaft 14.

A spacing sleeve 19 is mounted upon the wall of the enlargement 3 opposite the plate 15′ and the shaft 14 is provided with an enlargement 20, one end of which bears against the end of the sleeve 19 and with an additional enlargement 21, one end or shoulder of which bears against the end of a bearing flange 22 provided upon the wall of the enlargement 3. The enlargement 20 is provided with a rectangular transversely disposed opening 24 which slidably receives the end portion of the crank handle 25, the said handle being adjustably held in position in the enlargement 20 by means of a set screw 26 which passes thru the wall of the enlargement and which bears at its inner end against the side of that part of the crank handle 25 which is received within the opening 29. The crank handle 25 carries at its outer end a grip or knob 27.

From the foregoing description taken in conjunction with the accompanying drawings it will be seen that when the drill is applied and while it is being used the head 2 bears against the breast of the operator and one hand of the operator grasps the stock 1 at a point between the head 2 and the enlargement 3. The other hand of the operator grasps the knob or grip 27 and turns the crank 25 about the axis of the shaft 14 whereby the said shaft is rotated. Through the intermeshing pinions 15 and 13 rotary movement is transmitted from the shaft 14 to the shaft 9 and inasmuch as the shaft 9 carries the drill bit (not shown) the boring or drilling is effected when the bit is placed in position against the piece of work. As the bit is forced by pressure toward its work the anti-friction balls 8 interposed between the head 10 and the race 7 reduce the friction between the stock 1 and the shaft 9 and the said balls also hold the shaft 9 in proper position in the stock and against thrust strain incident to the applied pressure during the drilling operation.

Having described the invention what is claimed is:—

A drill comprising a stock provided at a point between its ends with an integrally joined hollow enlargement, there being sufficient lengths of the stock extending beyond the diametrically opposite sides of the enlargement to afford a hand hold upon the stock at either side of the enlargement, one end portion of the stock having a bore extending along its axis and the same end portion being provided at its extremity with a socket the side walls of which are integral with the stock, said bore communicating with the cavity of the enlargement and the socket, bearing balls located in the socket of the stock, a shaft journaled in the bore and having a head which is received in the socket and which engages and retains the balls and means mounted at the enlargement of the stock for turning the shaft.

In testimony whereof I affix my signature.

JOE C. WILLIAMS.