May 25, 1926. 1,586,243

J. HENRITZI

ROTARY ROCK DRILL

Filed Jan. 23, 1924

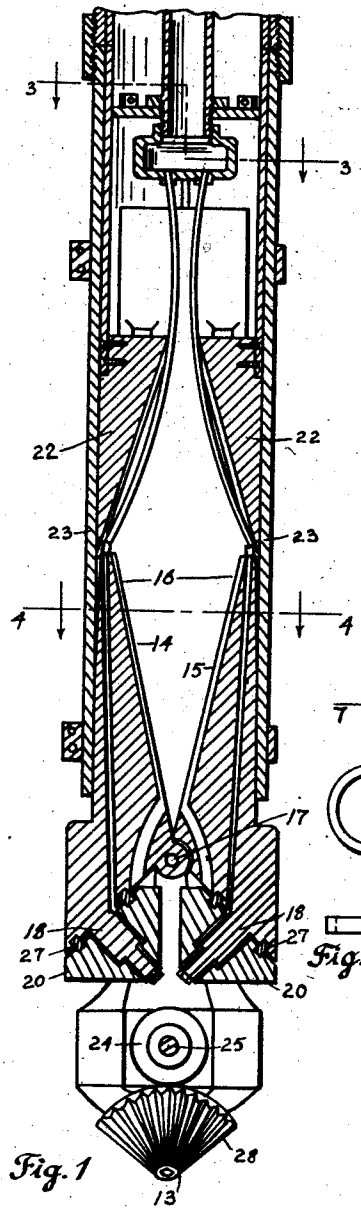



Fig. 1

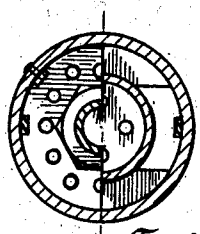


Fig. 3

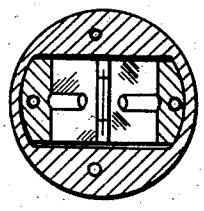


Fig. 4

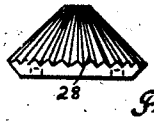



Fig. 5

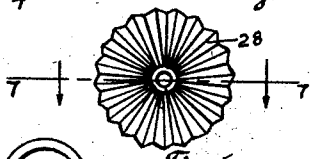



Fig. 6




Fig. 10



Fig. 7

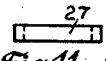



Fig. 11




Fig. 8

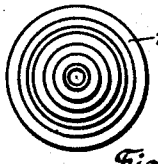



Fig. 9




Fig. 12




Fig. 13

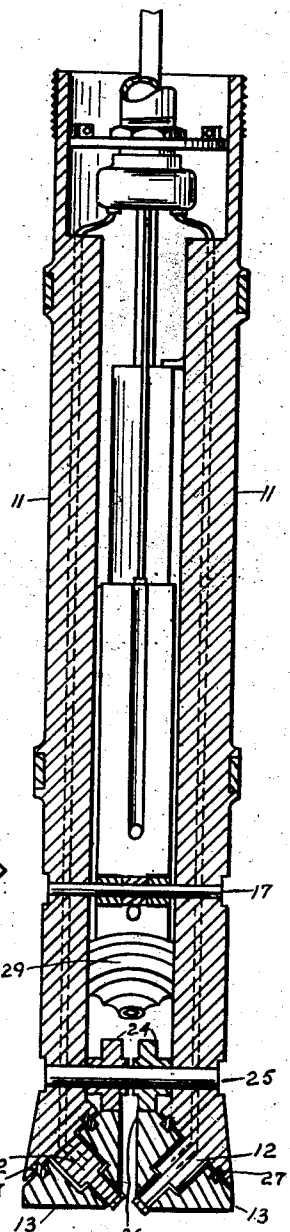



Fig. 2

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Patented May 25, 1926. 1,586,243

# UNITED STATES PATENT OFFICE.

JOSEPH HENRITZI, OF SPOKANE, WASHINGTON.

## ROTARY ROCK DRILL.

Application filed January 23, 1924. Serial No. 688,066.

This invention pertains to rotary rock drills, and has for its purpose to improve drills of the character mentioned.

This invention is especially intended to provide supports for the bits.

The invention will be hereinafter particularly described, pointed out in the claim and illustrated in the accompanying drawings, in which Figure 1 is a central longitudinal sectional view of a drill pipe embodying the invention, Figure 2 is a like sectional view taken at right angles to Figure 1, Figure 3 is a transverse sectional view taken on the line 3—3 of Figure 1, Figure 4 is a transverse sectional view taken on the line 4—4 of Figure 1, Figure 5 is an elevation of one form of bit used in the construction, Figure 6 is a plan view of the same, Figure 7 is a sectional view taken on the line 7—7 of Figure 6, Figure 8 is an elevation of another form of bit used in the construction, Figure 9 is a plan view of the same, Figure 10 is a plan view of one of a set of rings mounted adjacent the bearings of the bits to protect them from dirt, grit and sand, Figure 11 is a side view of the same, Figure 12 is a plan view of one of a set of roller pinions mounted in the frame in such a manner as to support the lower set of bits and Figure 13 is a side view of the same. This invention is an improvement upon the construction shown in the patent issued to me on September 11, 1923, Number 1,467,479, wherein I show a drill pipe 10 with oppositely disposed walls 11, thickened for some distance up from the bottom as shown in Figure 2, at the bottom of which are angular shafts 12 upon which are rotatably mounted cone bits 13. Mounted on the lower end of the pipe 10, oppositely disposed and between the thickened walls 11, are two jaws 14 and 15 having beveled surfaces 16, the two being hinged together on the shaft 17 extending transversely through the thickened walls 11. The lower ends of the jaws 14 and 15 are formed into angular shafts 18 and on these shafts are rotatably mounted cone bits 20. Suspended into the pipe 10 are wedges 22, brought to a feather edge 23 at the bottom and adapted to find their way between the pipe 10 and the outer surfaces of the upper ends of the jaws 14 and 15, the purpose being to force the upper ends of the jaws 14 and 15 together and thereby spread or expand the bits 20. Two sets of bits are thus provided, the lower set drilling a pilot hole and the upper set in the expanded position drilling the hole larger. I have improved the invention by providing means for supporting and adding to the strength of the lower set of bits 13 by mounting roller pinions 24 rotatably on a transverse shaft 25, such pinions being in continuous frictional contact with the surface 26 of the bits 13. I have further improved the invention by mortising annular rings 27 into the construction and surrounding both sets of shafts 12 and 18 with the same in such a manner as to protect the said shafts from dirt, grit and sand getting to the same through the openings between the shafts and bits. I have still further improved the invention by providing two varieties of bits of different cutting edges, one form being illustrated by Figures 5, 6 and 7, the same having transversely arranged cutting edges 28 and the other form illustrated in Figures 8 and 9, the same being provided with annular cutting edges 29. One each of these bits is installed in each set 12 and 20 whereby the material being drilled is cut first by grinding in one direction by one form of bit and then cross-cut by grinding cross-ways thereof by the other form of bit.

What is claimed is:

In rotary rock drills having cone bits rotatably mounted on shafts supported by a frame, idler pinions rotatably mounted in the frame above the bits and on a separate shaft therefrom and in such a manner as to bring the same into continuous frictional contact with the surface of the bits and to provide a support for the same.

In testimony whereof, I affix my signature.

JOSEPH HENRITZI.