March 24, 1936. F. S. HALE 2,035,156

DRILL PULLER

Filed March 18, 1935

Fig. 1.

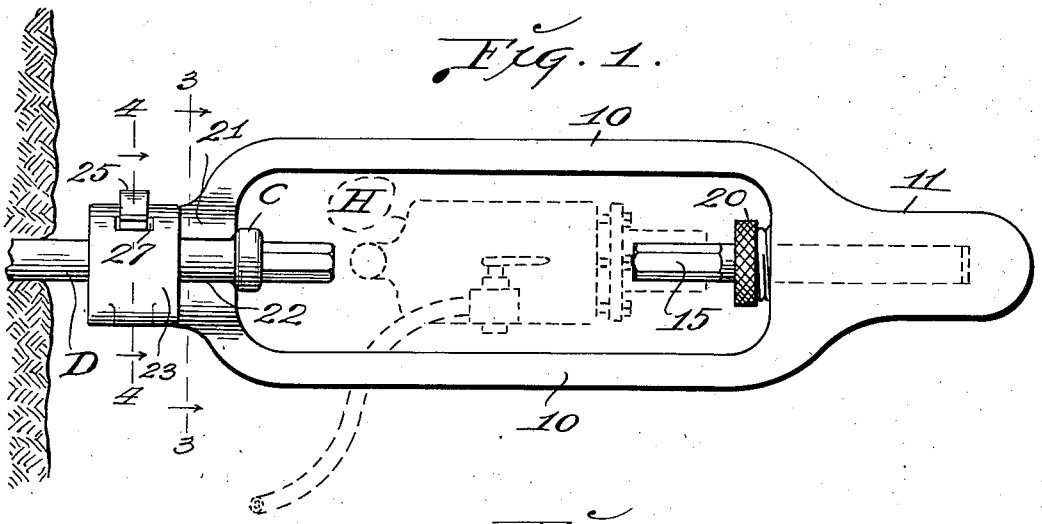


Fig. 2.

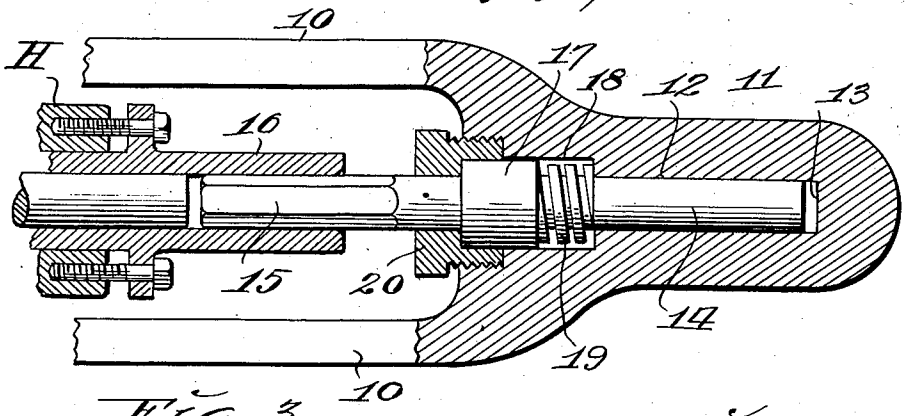


Fig. 3.

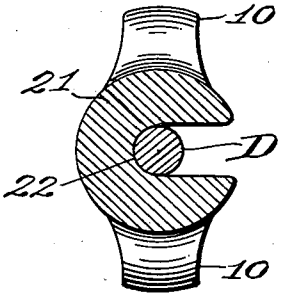
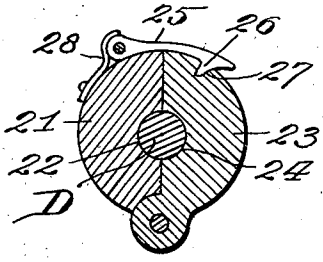


Fig. 4.



INVENTOR,
FRANK S. HALE.
BY Martin P. Smith, ATTY.

Patented Mar. 24, 1936 2,035,156

UNITED STATES PATENT OFFICE

2,035,156

DRILL PULLER

Frank S. Hale, Pomona, Calif., assignor of one-half to Edmond Marti, Pomona, Calif.

Application March 18, 1935, Serial No. 11,689

6 Claims. (Cl. 255—59)

My invention relates to a drill puller and has for its principal object, the provision of a relatively simple, practical and inexpensive device that may be conveniently employed for removing drills that have become stuck in the formation in which the drills are being used and said device being operated through the power of the pneumatic hammer or machine that is utilized for driving the drill into the rock or other formation.

A further object of my invention is, to provide a drill puller that includes a yoke provided at one end with an anvil and a plunger or hammer that is adapted to strike against said anvil during drill pulling operations and the other end of the yoke being provided with a clamp that is applied to the projecting end of the drill that is to be removed.

A further object of my invention is, to provide a drill puller that is constructed so that the force of the blows delivered by the pneumatic hammer are applied in direct longitudinal alignment with the stuck drill, thereby eliminating any tendency to bend the drill during the pulling operations.

With the foregoing and other objects in view my invention consists in certain novel features of construction and arrangements of parts that will be hereinafter more fully described and claimed and illustrated in the accompanying drawing in which:

Fig. 1 is a plan view of a drill puller constructed in accordance with my invention.

Fig. 2 is a vertical longitudinal section taken through the forward portion of the yoke and the anvil.

Fig. 3 is an enlarged cross section taken on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged cross section taken on the line 4—4 of Fig. 1.

Referring by numerals to the accompanying drawing which illustrates a preferred embodiment of my invention, 10, 10 designate the parallel arms of a yoke and formed integral with the forward ends of said arms, is a head 11 that performs the functions of an anvil.

Head 11 is provided with an axial bore 12 that terminates a short distance from the forward end of said head and the flat face 13 at the forward end of this bore receives the blows struck by the plunger or hammer that is actuated by the pneumatic hammer.

The forward portion 14 of the hammer or plunger is cylindrical in form and occupies the forward portion of bore 12. The rear portion 15 of the hammer and which projects rearwardly from the head 11 is made non-circular in cross section, preferably hexagonal, in order to be received in the sleeve or collar 16 on the forward end of the conventional pneumatic hammer H.

Formed integral with the intermediate portion of hammer 14, is an enlarged cylindrical member 17 that is mounted for reciprocatory movement within a chamber 18 that is formed at the rear end of bore 12.

Positioned within chamber 18 around the hammer 14 and interposed between member 17 and the shoulder between chamber 18 and bore 12, is an expansive coil spring 19 that tends to move the hammer 14 and member 17 rearwardly through the head or anvil 11.

Screw-seated in the rear end of the head 11, and surrounding the enlarged member 17, is a ring nut or bushing 20 that limits the rearward movement of member 17 and hammer 14.

Formed integral with and connecting the ends of the yoke members 10, opposite the head or anvil 11, and in direct longitudinal alignment with said head, is a short block 21, through which is formed a longitudinally disposed groove 22 for the accommodation of the drills that are removed by the device.

The rear portion of this block 21 is made half-round in cross section as illustrated in Fig. 4 and suitably hinged to the lower portion of this half round rear end is a block 23 that is half-round in cross section and which is provided on its inner face with a longitudinally disposed groove or channel 24 for the accommodation of the drill.

Pivotally mounted on the upper portion of block 21, is a large hook 25, the free end of which overlies the upper portion of block 23 and said overlying portion carrying a depending hook 26 which normally occupies a notch 27 in head 23 to retain the same in closed position upon block 21.

The free end of a spring 28 that is secured to block 21 engages on the pivoted end of the latch 25 so as to yieldingly hold the same in closed position.

In the use of my improved drill puller, latch 24 is open to permit block 23 to swing away from block 21 and the yoke is now manipulated so that the blocks 21 and 23 engage the stuck drill D immediately in front of the collar C that is formed on the drill near its rear end.

Block 23 is now swung upward against the flat face of block 21 and retained in such position by the latch 25.

The pneumatic hammer H is now reversed in position with respect to the position that occu-

pies while imparting blows to the drill and the socket or sleeve 16 at the forward end of the hammer is engaged on the projecting portion 15 of hammer 14.

The pneumatic hammer is now operated in the usual manner and the repeated blows of the plunger of said pneumatic hammer will be imparted to the end of the hammer 14 that occupies the socket 16.

On each blow of the plunger of the pneumatic hammer, the hammer 14 will be driven forwardly under the comparatively slight resistance offered by spring 19 and the forward end of the hammer 14 will strike against the anvil surface 13, thereby moving the entire yoke rearwardly and the pulling strains thus developed will be transmitted to the stuck drill D as a result of the engagement of the rear face of block 21 with the collar C that is carried by the drill.

Such operation quickly loosens the stuck drill and permits its removal from the drill hole.

Thus it will be seen that I have provided a drill puller that is relatively simple in construction, inexpensive of manufacture and very effective in performing the functions for which it is intended.

An especially desirable feature of my invention is the construction and arrangement whereby the force of the blows imparted by the plunger of the pneumatic hammer are directed in longitudinal alignment with the drill that is being pulled, thus eliminating any possibility of bending the drill during pulling operations.

It will be understood that minor changes in the size, form and construction of the various parts of my improved drill puller may be made and substituted for those herein shown and described without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

I claim as my invention:

1. In a drill puller, a yoke, an anvil at the forward end of said yoke, a plunger mounted for reciprocatory movement in said anvil, a spring arranged between said plunger and anvil for yieldingly resisting the forward movement of said plunger and means carried by the other end of said yoke for clamping a drill.

2. In a drill puller, a yoke, an anvil carried by the forward end of said yoke, a plunger arranged for reciprocatory movement in said anvil, a spring for yieldingly resisting the forward movement of said plunger and means on the rear end of said yoke for clamping a drill.

3. In a drill puller, a yoke, a head formed integral with the forward end of said yoke, said head having an axial bore that terminates adjacent the forward end of said head, a plunger mounted for reciprocatory movement in said bore, a spring associated with said plunger for yieldingly resisting its forward movement and the rear portion of said yoke being provided with a longitudinally disposed groove for the reception of a drill.

4. In a drill puller, a yoke, a head formed integral with the forward end of said yoke, said head having an axial bore that terminates adjacent the forward end of said head, a plunger mounted for reciprocatory movement in said bore, a spring associated with said plunger for yieldingly resisting its forward movement and means carried by the rear end of the yoke for clamping a drill.

5. In a drill puller, a yoke having parallel arms spaced a sufficient distance apart to straddle a pneumatic hammer, an anvil formed integral with the forward end of said yoke, a plunger mounted for reciprocatory movement in said anvil, a spring arranged between said plunger and anvil for yieldingly resisting the forward movement of said plunger and a block carried by the rear end of said yoke, which block is provided with a longitudinally disposed groove for the reception of a drill.

6. In a drill puller, a yoke having parallel arms spaced a sufficient distance apart to straddle a pneumatic hammer, an anvil formed integral with the forward end of said yoke, a plunger mounted for reciprocatory movement in said anvil, a spring arranged between said plunger and anvil for yieldingly resisting the forward movement of said plunger, a block carried by the rear end of said yoke, which block is provided with a longitudinally disposed groove for the reception of a drill and a member hinged to said block for clamping the drill that is positioned in said groove.

FRANK S. HALE.