Feb. 19, 1924. 1,484,378

G. M. NELL

THROTTLE VALVE LOCK FOR ROCK DRILLS

Filed Jan. 29, 1923

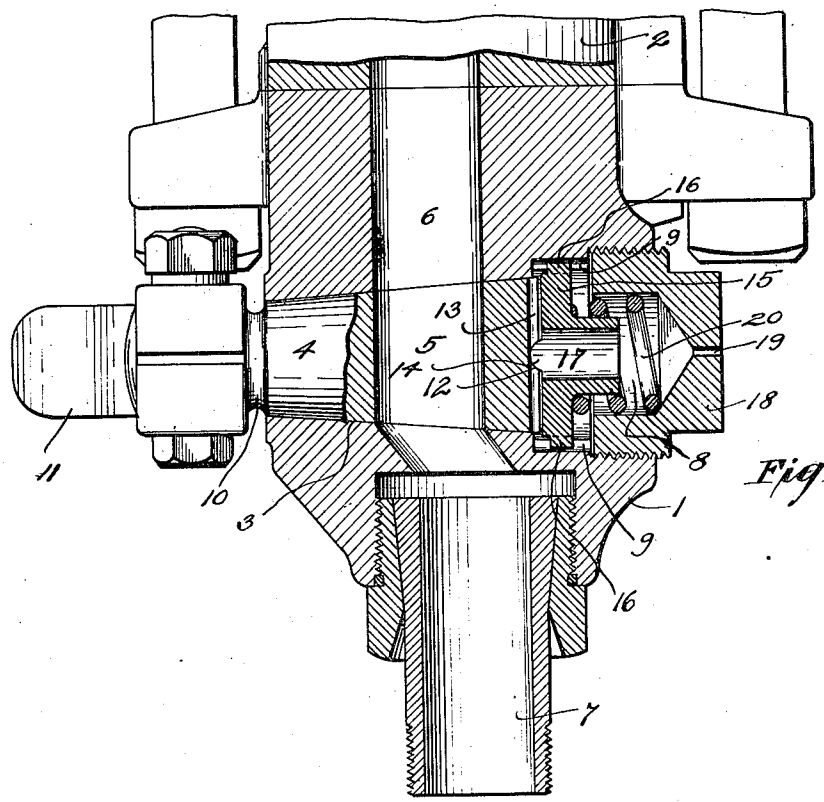


Fig 1.

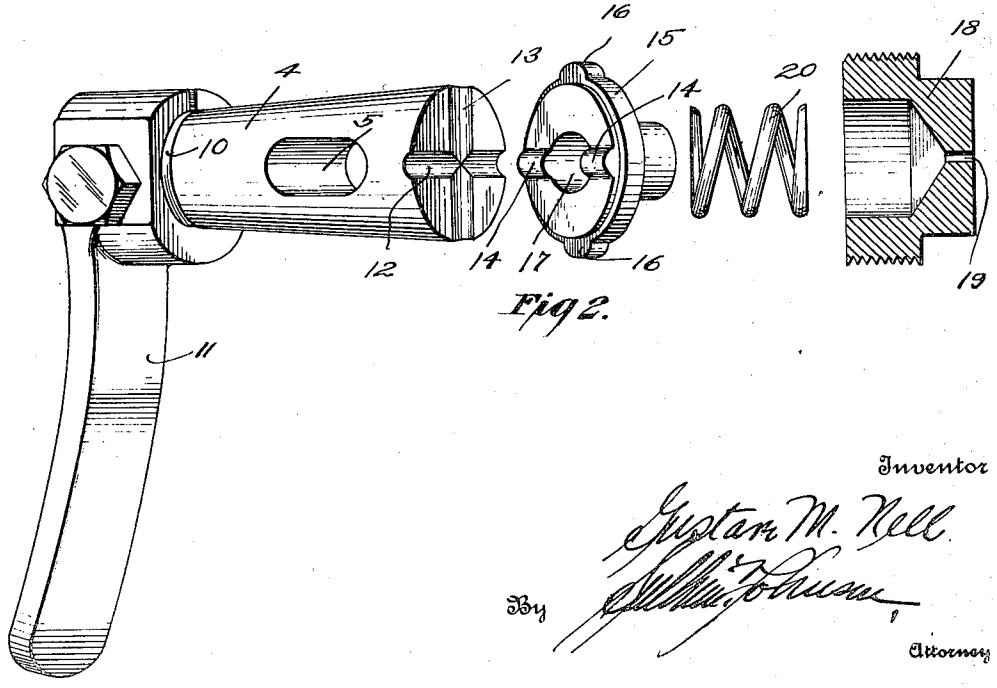


Fig 2.

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UNITED STATES PATENT OFFICE.

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THROTTLE-VALVE LOCK FOR ROCK DRILLS.

Application filed January 29, 1923. Serial No. 615,772.

To all whom it may concern:

Be it known that I, GUSTAVE M. NELL, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Throttle-Valve Locks for Rock Drills, of which the following is a specification.

The present invention is directed to improvements in throttle valve locks for rock drills.

The primary object of the invention is to provide a novel form of lock so constructed that it will operate to hold the throttle valve positively in its open or closed position.

As is well known rock drills of the hammer type are subjected to considerable vibration when running, this vibration oftimes causing the throttle valve to accidentally open or close, which is extremely undesirable, and it is to overcome this defect that the present invention has been perfected. Further it is the aim of this invention to provide a valve of this nature constructed and arranged in such manner that it can be easily operated owing to the fact that the pressure to hold the same seated is comparatively slight, but at the same time sufficient to hold the valve snugly on its seat to prevent leakage of the motive fluid. Heretofore tapered throttle valves for rock drills have been to some extent objectionable since leakage of air by the valve permits pressure to build up between the major end of the valve and closure plug which causes the valve to frictionally engage its seat to such an extent that it is extremely hard to rotate as long as the motive fluid is on, it being frequently necessary to strike the valve handle to permit the valve to be rotated, and it has been found from actual practice that this defect has been overcome.

With these and other objects in view, this invention resides in the novel features of construction, formation, combination and arrangement of parts to be hereinafter more fully described, claimed and illustrated in the accompanying drawing, in which:—

Figure 1 is a horizontal sectional view.

Figure 2 is a perspective view of the parts in a non-assembled condition.

Referring to the drawing, 1 designates the back head of a drill, and 2 a portion of the hammer cylinder, said back head including a valve seat 3 for rotatably receiving the tapered valve 4, said valve having a transverse port 5 formed therein which is brought into registration with the motive fluid passage 6 in the back head. Motive fluid is introduced into this passage through the coupling 7, and passes through the passage 6 and from thence to the hammer cylinder 2 (not shown) in a well known manner.

The major end of the seat 3 opens into a chamber 8 of greater diameter than the major diameter of said seat, the inner wall of said chamber being provided with diametrically opposed grooves 9, the purpose of which will appear later. The minor end of the valve 4 is provided with a stem 10 which extends beyond the adjacent side of the back head 1, and has fixed thereto the handle 11 for rotating the valve, as is customary.

The valve has its major end provided with grooves 12 and 13 which are disposed at right angles to each other for selective engagement with the rounded lugs 14 carried by the inner face of the disk 15. This disk is slightly less in diameter than the diameter of the chamber 8, and has its periphery formed with diametrically disposed ears 16 adapted to slidably engage the grooves 9. Thus it will be seen that the disk is capable of sliding in the chamber 8, but is held against rotation therein due to the fact of the interlocking engagement of the ears 16 and grooves 9. This disk has a central passage 17 formed therein, and threaded in the chamber 8 is a closure plug 18 having a central aperture 19 therein to permit motive fluid which may leak from the valve seat 3 into the chamber 8 through the passage 17, and from thence to atmosphere, thus eliminating the possibility of pressure building up in the chamber 8 and causing the valve to be forced into abnormal frictional engagement with its seat, and consequently retarding the free rotation of the valve when desired.

A coil spring 20 is employed, and has one terminal engaged with the outer face of the disk and its other terminal with confronting side of the plug 18, and serves to constantly urge the disk towards the valve so that the lugs 14 will be yieldably engaged in selected grooves 12 and 13. As shown in Fig. 1 of

the drawing the grooves 12 are interlocked with the lugs 14 of the disk, consequently the valve is positively held with its port 5 in registry with the passage 6, which is the open position. To close the valve it is only necessary to rotate the same until the grooves 13 are engaged with the lugs 14 and at which time a port 5 is out of registry with the passage 6.

Since the disk 15 can slide it is obvious that the valve can be easily rotated to cause the grooves 12 or 13 to snap into engagement with the lugs 14, as desired, and after the selected grooves are interlocked with the lugs accidental rotation of the valve is prevented owing to the fact that said disk is non-rotatable.

The spring 20 serves to yieldably hold the lugs in engagement with the grooves 12 and 13, but is of such tension that the valve can be rotated manually with comparative ease. The presence of the aperture 19 in the plug 18 eliminates any possibility of pressure being built up in the chamber 8, due to leakage of air by the valve, which as well known would tend to cause the valve to stick on its seat.

What is claimed is:—

1. In a throttle valve lock for rock drills, the combination with a back head, of a seat therein, a valve rotatable in the seat, said back head having a chamber therein adjacent the seat, said chamber having diametrically opposed grooves therein, a disk slidable in the chamber and having peripheral ears for slidably engaging the grooves to prevent rotation of the disk when the valve is rotated, and means for normally holding the disk yieldably interlocked with the valve, as and for the purpose set forth.

2. A valve lock of the class described, a seat, a valve rotatable in the seat, a disk slidably associated with the seat and yieldably urged to selected intimate interlocked engagement with the valve, and means for holding the disk against rotation when the valve is rotated.

3. In a throttle valve lock for rock drills, the combination with a back head, of a seat therein, a valve rotatable in the seat, said back head having a chamber therein adjacent said seat, a disk slidable in the chamber, means to prevent rotation of the disk when the valve is rotated, said disk having lugs carried thereby, the valve having grooves in one end for selective engagement with the lugs, and means for holding the lugs in yielding engagement with selected grooves in the valve, as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

GUSTAVE M. NELL.

Witnesses:
LED. L. RICHARDSON,
E. L. OLDHAM.