Feb. 16, 1926. 1,573,458

W. A. SMITH

CUSHION HANDLE

Filed March 13, 1925

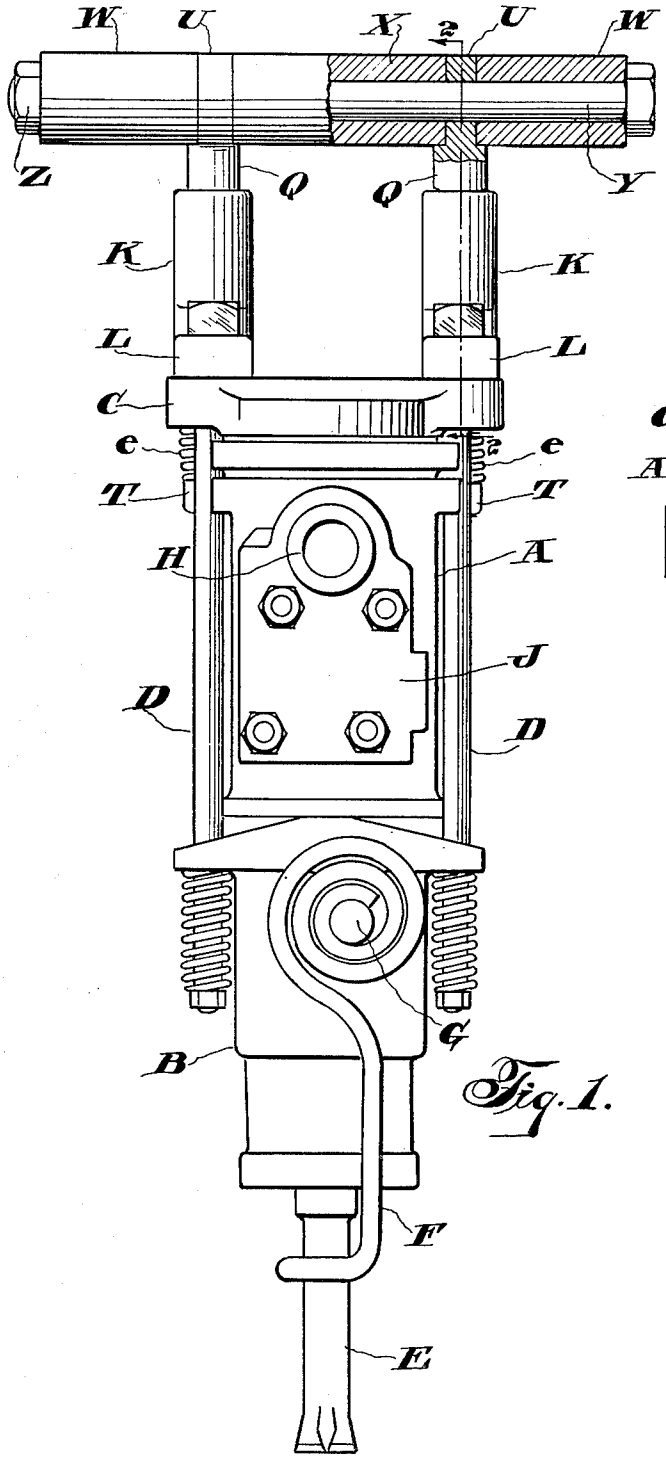


Fig. 1.

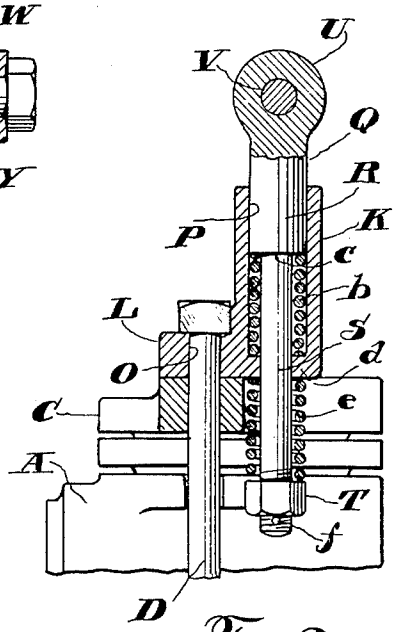


Fig. 2.

INVENTOR.
William A. Smith.
BY Herbert G. Ogden
HIS ATTORNEY

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UNITED STATES PATENT OFFICE.

WILLIAM A. SMITH, OF ATHENS, PENNSYLVANIA, ASSIGNOR TO INGERSOLL-RAND COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

CUSHION HANDLE.

Application filed March 13, 1925. Serial No. 15,302.

To all whom it may concern:

Be it known that I, WILLIAM A. SMITH, a citizen of the United States, and a resident of Athens, county of Bradford, State of Pennsylvania, have invented a certain Cushion Handle, of which the following is a specification accompanied by drawings.

This invention relates to fluid actuated rock drills, and more particularly to cushion handles for that type of rock drill which is supported and guided by the operator.

One object of the invention is to prevent excessive shocks and vibration set up in the machine from being transmitted to the guiding handle of the machine. Another object is to produce a cushioned handle for a rock drill which is efficient in operation and may be readily adjusted to immediate requirements.

Other objects and advantages will be in part obvious and in part pointed out hereinafter.

In the drawings forming part of the specification and in which similar reference characters refer to similar parts,

Figure 1 is a side view in elevation and partly in section, of a rock drill equipped with a cushioned handle constructed in accordance with the practice of the invention, and

Figure 2 is a transverse view partly in section taken through Figure 1 on the line 2—2, looking in the direction of the arrows.

Referring to the drawings, the invention is shown embodied in a rock drill of the hand held type, in which a hammer cylinder A, a front head B and a back head C are held in operative position by spring pressed side bolts D.

Disposed within the front head B is a collared drill steel E. A yoked steel retainer F is supported pivotally by trunnions G on opposite sides of the front head, and the yoke portion of the retainer embraces the steel E in advance of the drill steel collar and cooperates therewith for retaining the drill steel within the front head B. A suitable hammer piston (not shown) is arranged within the cylinder A and reciprocates therein for delivering impact blows upon the drill steel E.

Pressure fluid is introduced into the machine through an inlet opening H and the distribution of the pressure fluid is effected by a suitable valve (not shown) within the valve chest J.

In accordance with the practice of the invention, a handle is provided which cooperates with a pair of cylinders K arranged independently of each other on the back head C, and provided with lateral flanges L which serve as a base for the cylinders. In this instance the cylinders K are held against longitudinal movement by the bolts D which extend through holes O of the flanges L.

Arranged within the bore P of the cylinders K are a pair of plungers Q having a bearing portion R and a reduced extension S. In this instance, the extension S is threaded at its end to receive a nut T. The opposite end of the plunger Q terminates in a circular flange U having a longitudinal bore V. Hollow sleeves W abut the outer faces of the flanges U. A similar sleeve X of suitable length is interposed between the flanges U and serves as a spacer for holding the plungers Q, and consequently the cylinders K, in proper relation with each other. In this instance, a bolt Y extends through the sleeves W and X and the holes V of the flanges U and is provided with a suitable nut Z for clamping said sleeves firmly together, to form the handle for manipulating the machine.

In order to cushion the relative longitudinal movement between the plungers Q and the cylinders K in one direction, springs *b* are disposed within the bore P of the cylinders K. One end of said springs bears against a face *c* of the plunger Q and the other end bears against the bottom wall *d* of the cylinder bore P. Similar springs *e* are arranged beneath the cylinders K and are guided by the extension S to cushion the movement of the plungers in the opposite direction. One end of the springs *e* bears against the cylinder wall *d*, and the other end of said springs rests on the nuts T which also provide a means for adjusting the tension of the cushioning springs *b* and *e*. In this instance, the nut T is held against accidental removal by a pin *f* extending transversely through the extension S near its end.

The above described cushioned handle has been found to be very efficient, and the parts constituting the handle, as well as the springs, may readily be removed or may

be replaced by removing the nuts T and without disturbing the assembly of the machine.

I claim:

1. In a cushioning device for rock drills, the combination of a back head, cylinders formed separately and mounted on said back head, plungers to reciprocate within said cylinders, spring pressed side bolts for securing the cylinders to the back head, a pair of springs of equal diameter associated with each plunger to cushion longitudinal movement of the plungers in both directions, and a handle supported by the plungers for guiding the rock drill and holding the cylinders against rotation with respect to said back head.

2. In a cushioning device for rock drills, the combination of a back head, a pair of cylinders secured removably to the back head, a lateral flange on each cylinder, spring pressed side bolts to cooperate with the lateral flanges for securing the cylinders to the back head, plungers to reciprocate within the cylinders, a pair of springs of equal diameter associated with each plunger for cushioning relative longitudinal movement between the plungers and the cylinders in both directions, and a handle secured to one end of the plungers for guiding the rock drill and for holding the cylinders against rotative movement with respect to the back head.

3. In a cushioning device for rock drills, the combination of a back head, a pair of independent cylinders supported by the back head, a lateral flange on each cylinder, spring pressed side bolts extending through the lateral flanges and the back head for securing the cylinders to the back head, plungers to reciprocate within the cylinders, said plungers having a reduced forward extension, springs within the cylinders to cushion the movement of the plungers in one direction, springs beneath the cylinders to cushion the movement of the plungers in the opposite direction, nuts on said extension for holding the plungers and springs in operative position and for adjusting the tension of the springs, and a handle secured to the plungers for guiding the rock drill and for holding the cylinders against rotative movement with respect to the back head.

4. In a cushioning device for rock drills, the combination of a back head, a pair of cylinders formed separately and mounted on said back head, a lateral flange on each cylinder, spring pressed side bolts on opposite sides of the rock drill extending through the back head and the lateral flanges for securing the cylinders to the back head, plungers to reciprocate within the cylinders, reduced forward extensions on the plungers, springs in the cylinders and on the extensions for cushioning the movement of the plungers in one direction, springs beneath the cylinders and on the extensions for cushioning the movement of the plungers in the opposite direction, nuts on an end of said extensions for holding the plungers and springs in operative position and for simultaneously adjusting the tension of the springs on the extensions, and a handle connecting the plungers for holding the cylinders against rotative movement with respect to the back head and for guiding the rock drill.

In testimony whereof I have signed this specification.

WILLIAM A. SMITH.