G. G. TUTTLE.

DRILL STEEL RETAINER.

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1,429,808. Patented Sept. 19, 1922.

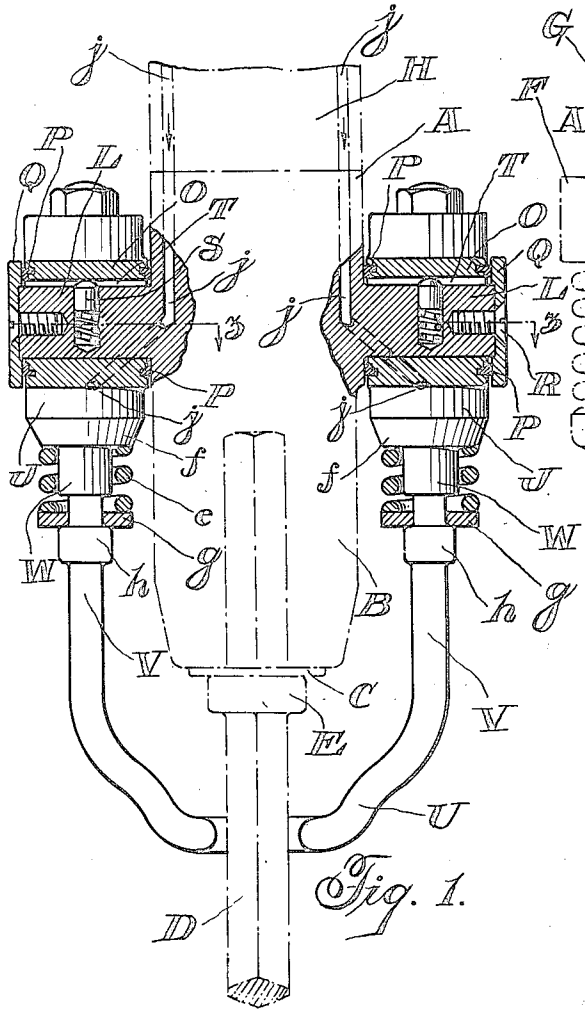


Fig. 1.

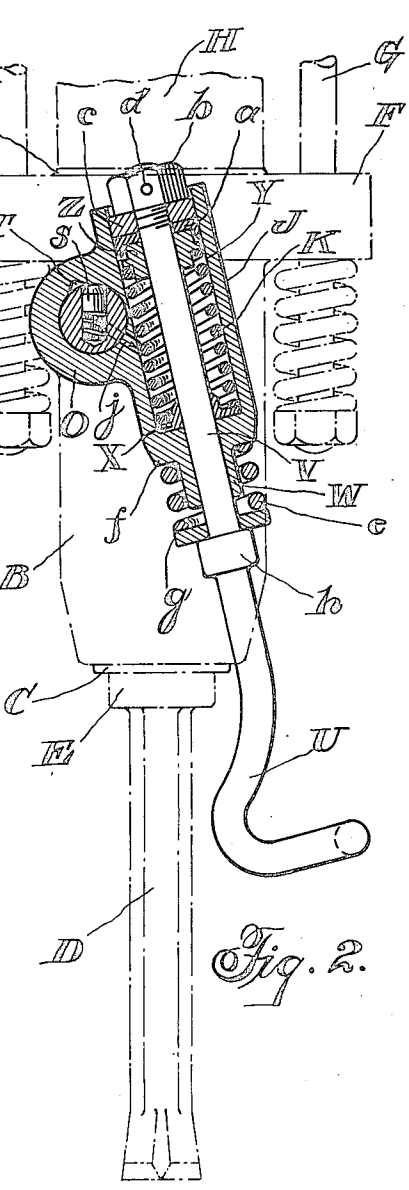


Fig. 2.

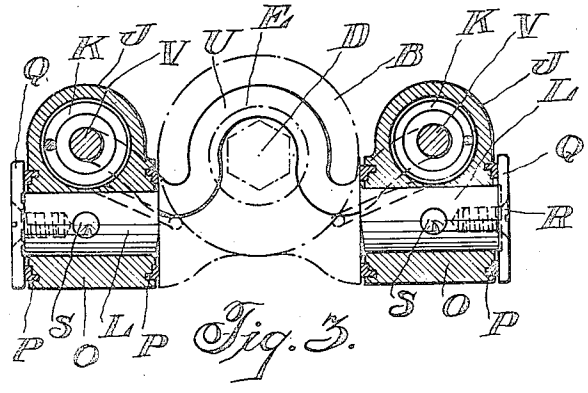


Fig. 3.

INVENTOR

Grover G. Tuttle

BY

Herbert G. Ogden

HIS ATTORNEY

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UNITED STATES PATENT OFFICE.

GROVER G. TUTTLE, OF PHILLIPSBURG, NEW JERSEY, ASSIGNOR TO INGERSOLL-RAND COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

DRILL-STEEL RETAINER.

Application filed June 2, 1921. Serial No. 474,476.

To all whom it may concern:

Be it known that I, GROVER G. TUTTLE, a citizen of the United States, and a resident of Phillipsburg, Warren County, State of New Jersey, have invented a certain Drill-Steel Retainer, of which the following is a specification accompanied by drawings.

This invention relates to drill steel retainers for rock drills, but more particularly to that type of retainer in which a yoke embraces the drill steel and is suitably held or clamped in position upon the front head of the machine.

Such yoke retainers are subjected to severe impact as the collar on the drill steel strikes the yoke and various devices have been employed to cushion or yieldingly hold the yoke to avoid breakage of the parts, some of these devices including bolts and springs, but the breakage is difficult to overcome, and the more complex the parts, the greater the danger of breakage becomes.

The primary objects of the present invention are to simplify the retainer construction, and reduce the chances of breakage by avoiding the use of retainer bolts and supporting the yoke retainer from the front head of the machine by means of an arrangement of main and supplementary springs which cushion the yoke in both directions.

Another object of the invention is to supplement the expansive force of the main springs in holding the retainer, by means of fluid under pressure, which may be the live pressure taken from the supply inlet of the machine. In such case, if the pressure fails for any reason, the main retainer springs still fulfill the function of exerting pressure to cushion the yoke.

Another object of the invention is to make the casings for the springs separate from the front head and mount them to swing relatively to the front head, carrying the yoke retainer with them. This avoids the necessity of pivoting the yoke retainer to the spring casings and permits a simpler connection between the retainer and the spring casings.

To these ends the invention is shown in its preferred forms in the accompanying drawings, in which

Figure 1 is a diagrammatic front elevation of the front head of a rock drill having my drill steel retainer applied thereto, parts of the front head and retainer being shown in vertical section,

Figure 2 is a side elevation of the device in longitudinal section, and

Figure 3 is a horizontal sectional plan view of Figure 1 on the line 3—3.

Referring to the drawings, A represents diagrammatically the front head of a rock drill having the nose piece B, adapted to receive the usual front head bushing C through which the drill steel D having the collar E is adapted to extend in position to receive the impact blows of the hammer. The front head is provided with the usual lugs F through which the side bolts G extend for clamping the cylinder and front head together. In this instance the front end portion H of the cylinder casing is shown diagrammatically and partly broken away to indicate the relation of the parts.

In accordance with my invention the front head is provided with cushion holding guides J pivoted at opposite sides of the machine and main cushioning means in the form of coiled springs K are guided and held within said guides J. In order to suitably pivot the guides J so that they may swing at each side of the front head, the said front head is conveniently provided with trunnions L and the guides J are formed with bosses or bearing portions O forming sockets for the trunnions L. For purposes hereinafter to appear, leather washers P are preferably arranged between the socket portions of the guides and the front head and underneath the caps Q, which are secured to the trunnions as by means of the screws R thus forming air tight joints around the trunnions. Spring pressed pins or detents S in the trunnions are adapted to cooperate with the notches T in the socket pieces for centering and maintaining the guides in longitudinal position except when moved out of said position.

A yoke retainer U for the drill steel is provided with arms V guided in the spring holding guides J and slidable longitudinally in said guides. The shanks or arms V of the yoke extend through the necks W of the guides and cup leathers or washers of any

suitable material X are seated over the yoke arms in the bottoms of the recessed portions Y of the guides. The main springs K, preferably coiled springs, surround the yoke arms, and caps Z are preferably placed over the springs to act as bearings. Cup leathers *a* or washers of any suitable material are placed over the caps Z and nuts *b* over the washers *c* are secured to the ends of the bolts and retained in position as by means of suitable cotter pins *d*. Supplementary springs *e* are preferably coiled over the necks W of the spring guides and adapted to be held between the shoulders *f* of the guides, and washers *g* bearing on the stops or collars *h* formed on the yoke arms V.

Fluid pressure passageways *j* extending through the cylinder casing H and through the front head A of the machine are adapted to communicate with the interior of the hollow socket portions Y of the cushion holding guides J and supplement the expansive force of the main springs K.

In the operation of the device it will be obvious that the yoke retainer may be swung into and out of retaining position about the trunnions L in which case the entire spring guides and yoke pivot about the trunnions. When the yoke is in retaining position the main springs K resist the blows of the collar E of the drill steel against the yoke, and the supplemental springs *e* resist pressure in the opposite direction and serve to retract the yoke. The main springs are entirely enclosed and protected in the guides and the upward pull of the yoke arms is resisted by the stops *h* forming collars on said arms integral therewith which are not liable to become broken. The packing in the form of washers P and cup leathers X and *a* effectively seal the chambers formed within the recessed portions of the guides J so that the air pressure, preferably live air, admitted to said chambers tends to assist the expansive force of the main springs K although if these springs are made sufficiently strong they will accomplish their purpose without the assistance of compressed air. The air, however, is a valuable adjunct in a device of this character.

I claim:

1. A drill steel retainer for rock drills, comprising cushion holding guides pivoted at opposite sides of the front head of the machine, cushioning means on said guides, a yoke retainer for the drill steel having arms guided in said guides and cushioned by said cushioning means, and means for maintaining fluid pressure within said guides to supplement the expansive force of the cushioning means in one direction.

2. A drill steel retainer for rock drills, comprising spring holding guides pivoted at opposite sides of the front head of the machine, coiled springs held on said guides, a yoke retainer for the drill steel having arms guided in said guides and cushioned by said springs, and means for maintaining fluid pressure within said guides to supplement the expansive force of the cushioning means in one direction.

3. A drill steel retainer for rock drills, comprising spring holding guides pivoted at opposite sides of the front head of the machine, coiled springs held on said guides, a yoke retainer for the drill steel having arms slidable longitudinally in said guides and cushioned in both directions by springs, and means for maintaining fluid pressure within said guides to supplement the expansive force of the cushioning means in one direction.

4. A drill steel retainer for rock drills, comprising spring holding guides pivoted at the opposite sides of the front head of the machine, main springs coiled within said guides, a yoke retainer for the drill steel having arms slidable in said guides and cushioned in one direction by said main springs, stops on said arms, supplementary springs between said stops and the guides for cushioning the yoke in the opposite direction, and means for maintaining fluid pressure within said guides to supplement the expansive force of the cushioning means in one direction.

In testimony whereof I have signed this specification.

GROVER G. TUTTLE.