Feb. 15, 1938. R. O. ALLEN 2,108,032

LOCKING DEVICE

Filed March 18, 1937

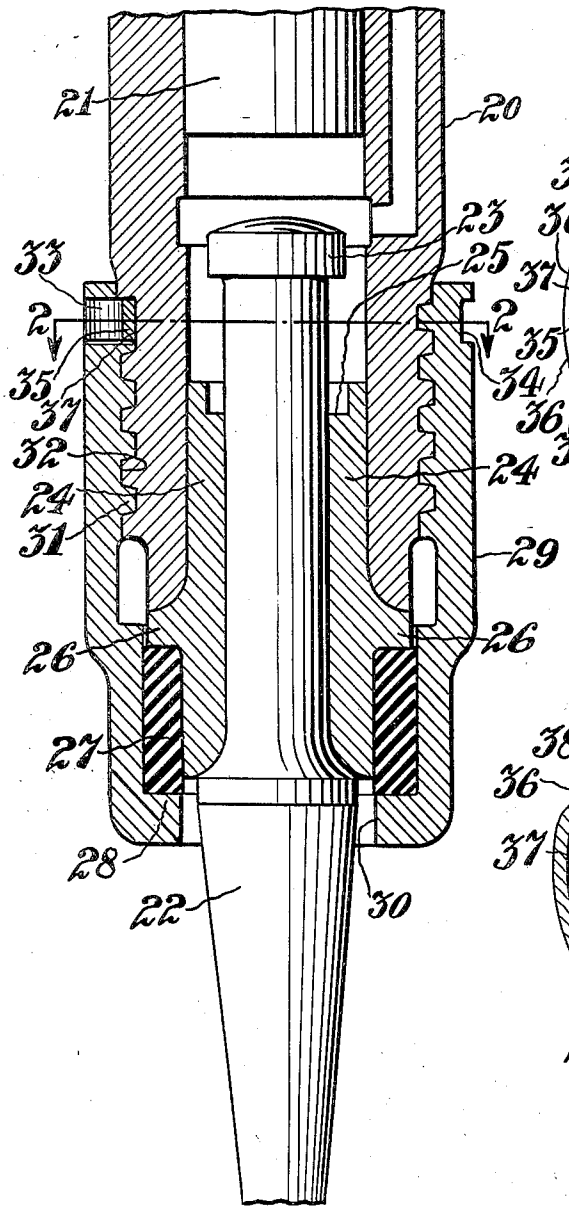


FIG.-1.

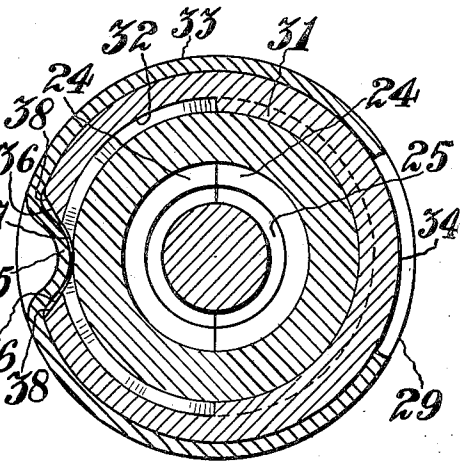


FIG.-2.

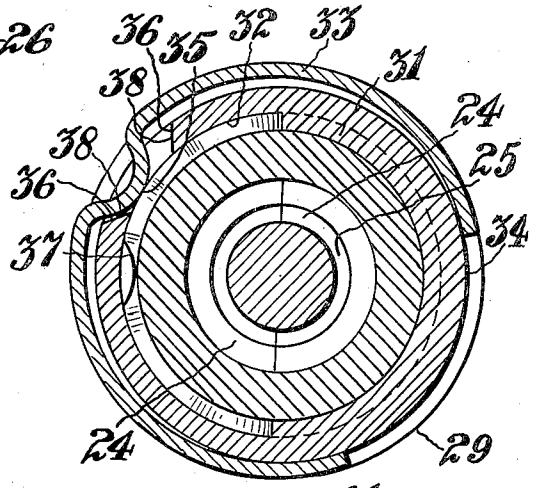


FIG.-3.

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Patented Feb. 15, 1938

2,108,032

UNITED STATES PATENT OFFICE

2,108,032

LOCKING DEVICE

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Application March 18, 1937, Serial No. 131,712

1 Claim. (Cl. 151—6)

This invention relates to retaining devices, and more particularly to a locking device for securing the working implement retainer to the casing of the percussive tool whereby the working implement is actuated.

The retainer cap, in accordance with a well known practice, is threadedly connected to the rock drill casing and is entirely unthreaded from the casing to permit removal of the working implement. In addition to its function of retaining the working implement in the percussive tool the retainer cap also houses suitable devices intended to guide the working implement and to absorb its impact against such guiding devices. The arrangement provides a convenient and rugged retainer for working implements, but may, in the absence of suitable locking devices, become unthreaded by the vibration incident to the operation of the percussive tool.

Various arrangements have been suggested to prevent the unauthorized shifting of the parts but those hitherto employed usually require the independent manipulation of the locking devices and often special implements to retain the locking devices out of engaging position during the placing and removal of the retainer cap on and from the cylinder. This obviously requires a considerable amount of time and is frequently the cause of injury to the operator.

It is accordingly an object of the present invention to effect a secure locking engagement between the casing of the percussive tool and the retainer cap without requiring the independent manipulation of the locking device.

Another object is to enable the retainer cap to be readily threaded upon the percussive tool casing and removed therefrom without hindrance from the locking device, and still another object is to so arrange the locking device as to preclude the possibility of injury to the operator.

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

In the drawing accompanying this specification and in which similar reference numerals refer to similar parts,

Figure 1 is an elevation, in section, of a front end of a percussive tool and a retainer cap secured to the percussive tool with a locking device constructed in accordance with the practice of the invention, and

Figures 2 and 3 are transverse views taken through Figure 1 on the line 2—2 showing the locking device in locking and releasing positions, respectively.

Referring more particularly to the drawing, 20 designates the front end of a rock drill cylinder and 21 a hammer piston reciprocable within the cylinder to actuate a working implement 22 extending into the front end of the cylinder 20.

The working implement 22 may be of any well known type having a collar 23 at its rearmost extremity, and arranged slidably in the front end of the cylinder 20 is a guiding device for the working implement consisting of a pair of semi-cylindrical members 24 of which the rear ends 25 serve as abutments for the collar 23. The members 24 extend exteriorly of the cylinder 20 and are provided intermediate their ends with external flanges 26 which engage the front end of the cylinder 20 to limit the distance which the members 24 may extend into the cylinder.

The flanges 26 serve the further function of seats for an annular rubber buffer 27 which encircles the portions of the members 24 forwardly of the flanges 26 and preferably extend a slight distance forwardly of the members 24. The buffer 27 is maintained seated against the flanges 26 by a shoulder 28 of a retainer cap 29 having an aperture 30 in its front end.

The retainer cap 29 is provided with internal threads 31 for engagement with external threads 32 on the front end of the cylinder 20, and in the correctly assembled position of the parts the shoulder 28 presses the buffer 27 against the flanges 26 and the flanges 26, in turn, against the front end of the cylinder 20. Thus, if during the operation of the percussive tool the working implement 22 is projected sharply forwardly the shoulder 23 will strike against the members 24 and the resulting shock is absorbed by the buffer 27.

The locking device constructed in accordance with the practice of the invention and serving to prevent unauthorized movement between the retainer cap and the cylinder 20 comprises a flexible member in the form of a spring clip 33 which is arranged in an annular guide groove 34 in the periphery and near the rearmost end of the retainer cap 29. The spring clip is of such diameter that when arranged in the groove 34 it is in firm gripping engagement with the retainer cap 29.

Intermediate the ends of the spring clip is an introverted hump 35 which extends through an aperture 36 in the retainer cap 29 and into an arcuate depression or notch 37 in the portion of the thread 32 lying in the same transverse plane as the groove 34 when the retainer cap 29 occu-

pies the desired assembled position on the cylinder **20**.

The top and bottom surfaces of the aperture **36** are parallel with respect to each other but the side surfaces **38** are inclined with respect to each other to conform approximately with the inclination of the adjacent portion of the hump **35** which they are intended to engage upon rotary movement of the cap **29** with respect to the cylinder **20**.

The operation of the device is as follows: Whenever it is intended to remove the cap **29** for replacing a working implement the initial unthreading movement of the cap **29** bring a surface **38** into engagement with a side of the hump **35** and upon further unthreading movement of the cap the hump will be lifted out of the notch **37** until the crest of the hump rests upon the crest of the thread **32**. The retainer cap **29** may then be removed and during the unthreading thereof the hump merely rides over the thread **32** without in any way hindering the free rotation of the cap.

After a new working implement has been placed in the percussive tool the retainer cap is again threaded in position and when the aperture **36** again moves into registry with the notch **37** the hump **35** will be drawn into the notch **37** by the resilient portions of the spring clip **33** lying on opposite sides of the hump.

During the shifting of the retainer cap **29** with respect to the cylinder the spring clip will constantly remain in substantially the correct operative position with respect to the retainer cap. It will, therefore, always be in readiness to perform its required function and does not necessitate the use of special tools or appliances for moving it into and out of locking position.

I claim:

In a locking device, the combination of an inner member and an outer member threaded thereon, an arcuate groove in the thread of the inner member, an unsecured spring clip freely embracing a portion of the outer member, an aperture in the outer member, an arcuate hump shaped to conform with the arcuate groove formed by the spring clip and extending through said aperture into the arcuate groove to normally lock the members against relative rotation, surfaces defining the aperture on the outer member to lift the hump out of the groove upon relative rotary movement between the members, and an annular spring groove on the outer member to prevent movement of the spring clip longitudinally of the outer member.

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