Nov. 13, 1928. 1,691,599

W. F. ZIMMERMANN

LOCKING DEVICE

Filed Oct. 2, 1926

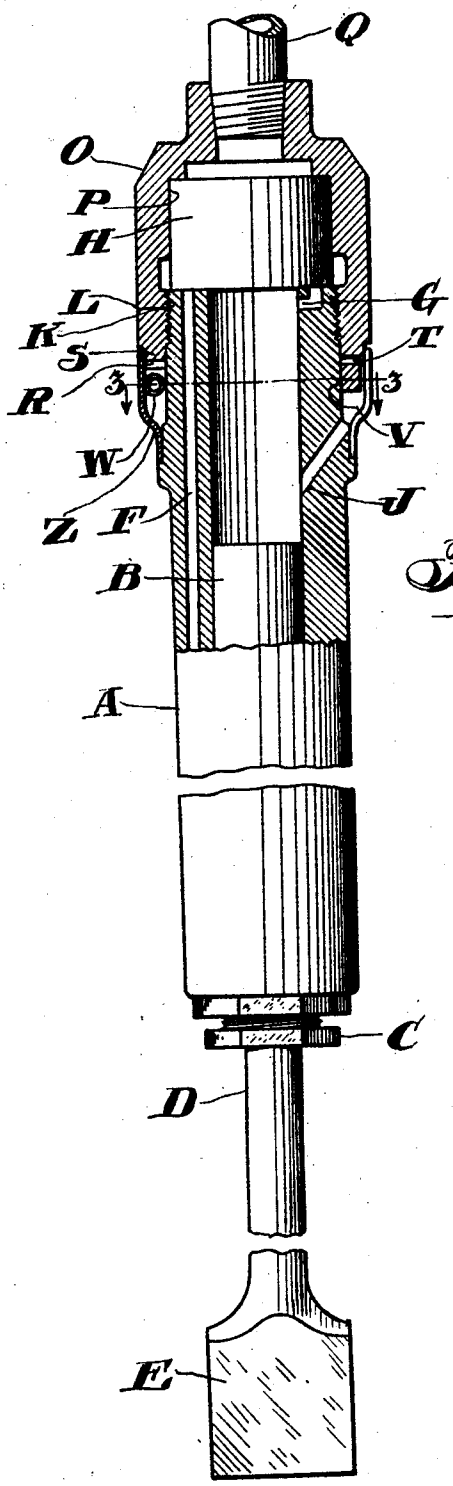


Fig. 1.

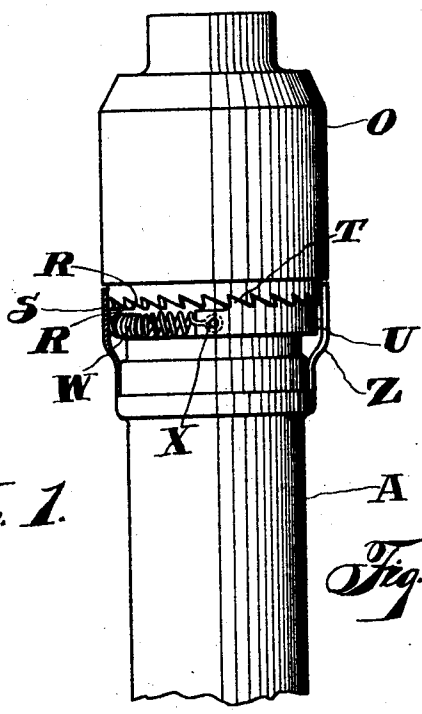


Fig. 2.

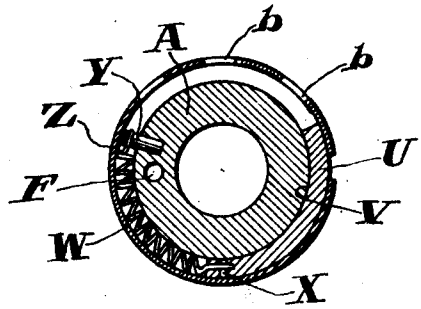


Fig. 3.

INVENTOR.
William F. Zimmermann
BY Robert B. Allen
HIS ATTORNEY.

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UNITED STATES PATENT OFFICE.

WILLIAM FRANK ZIMMERMANN, OF WAVERLY, NEW YORK, ASSIGNOR TO INGERSOLL-RAND COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

LOCKING DEVICE.

Application filed October 2, 1926. Serial No. 139,099.

This invention relates to pneumatic tools, but more particularly to a locking device for pneumatic sand rammers and the like in which the parts comprising the casing are secured together by means of screw threads.

The object of the invention is to insure a tight connection between the casing parts of sand rammers and similar tools.

Other objects will appear hereinafter.

The invention is shown in one of its preferred forms in the accompanying drawings, in which

Figure 1 is an elevation, partly in section, of a sand rammer equipped with a locking device constructed in accordance with the practice of the invention,

Figure 2 is a side elevation of the upper or rearward portion of the sand rammer, and

Figure 3 is a transverse view taken through Figure 1 on the line 3—3 looking in the direction of the arrows.

Referring to the drawings, the invention is shown applied to a pneumatic sand rammer having a cylinder A provided with a reciprocatory hammer piston B. A bushing C screwed into the front end of the cylinder A forms a closure therefor and acts as a guide for a shank D of the piston B on which is fastened a butt or pein E as a working implement, said shank D being an extended and smaller portion of the piston B. Passages F and G are formed in the cylinder A to convey pressure fluid to the front and rear ends respectively for actuating the piston B. The passages F and G in this instance lead from the rearward end of the cylinder A and are intended to be controlled by a suitable distributing valve (not shown) but which may be encased by a valve chest H situated at the rearward end of the cylinder A. A free exhaust port J in the cylinder A is in this instance controlled only by the piston B.

In the present instance the rearward end of the cylinder A is screw threaded as at K to cooperate with a correspondingly threaded portion L of a hood O. The hood O is provided with a recess P to accommodate the valve chest H and serves to hold said valve chest firmly in assembled position against the end of the cylinder A.

Pressure fluid is in this instance conveyed to the valve chest H through a pipe or conduit Q which may also serve as a handle or stem whereby the tool may be guided and held to the work.

In accordance with this invention means are provided for preventing accidental unscrewing of the hood O from the cylinder A as well as to automatically tighten the connection between the hood and the cylinder in case the cooperating threads of these elements become slightly worn due to the vibration of the tool during its operation. To this end teeth R are cut radially in the forward end S of the hood O and these teeth are preferably given both a longitudinal and radial back taper to insure constant engagement of the teeth R with similar teeth T carried by a key U. The key U in this instance is of arcuate form and its inner surface V preferably conforms substantially to the outer surface of the cylinder A whereon it is slidably mounted.

In order that the key U may be at all times pressed firmly against the teeth R of the hood O, a spiral tension spring W located wholly at one side of the cylinder is secured at one end to the key U by means of a pin X and anchored at its other end to a pin Y secured fixedly to the cylinder A is adapted to exert a constant pull on the key tending to rotate the hood O in the direction in which the hood is screwed on the cylinder.

To at all times protect the spring W against injury as well as to provide an additional means for preventing the key U from being accidentally disengaged from the hood O, a cylindrical split sleeve Z is arranged around the rearward end of the cylinder A and is preferably of a length to encircle slidably the forward or serrated portion of the hood O. This sleeve Z in this instance also serves as a muffler for the pressure fluid issuing from the free exhaust port J and is provided with a plurality of apertures *b* for the escape of pressure fluid from the interior of the sleeve to the atmosphere.

In practice, whenever it is desired to unscrew the hood O from the cylinder A, the sleeve Z may be slightly spread and moved forwardly on the cylinder A in advance of the key U. The key U may then be disengaged from the hood O and the hood unscrewed from the cylinder in the usual manner. After the hood has again been screwed on the cylinder, the key U may be moved around the cylinder until a considerable tension is set up in the spring W. The teeth of the key may then be placed in engagement with the teeth on the hood and, owing to the

back taper of the contacting surfaces of the cooperating teeth, the key U will be held against disengagement from the hood O.

The above described device forms a simple and effective means for maintaining a tight connection between the hood and the cylinder. Owing to the constant tension exerted by the spring W, the cooperating threads of these parts will be subjected to a minimum amount of wear.

I claim:

In a pneumatic tool, the combination of a cylinder, a hood screwed on the cylinder, teeth on the end of the hood, a key having teeth to interlock with the teeth on the hood, the teeth of said hood and said key being back-tapered longitudinally and radially to insure against disengagement of the key from the hood, and a spring anchored to the cylinder and to the key exerting a constant pull tending to tighten the connection between the hood and the cylinder.

In testimony whereof I have signed this specification.

WILLIAM FRANK ZIMMERMANN.