

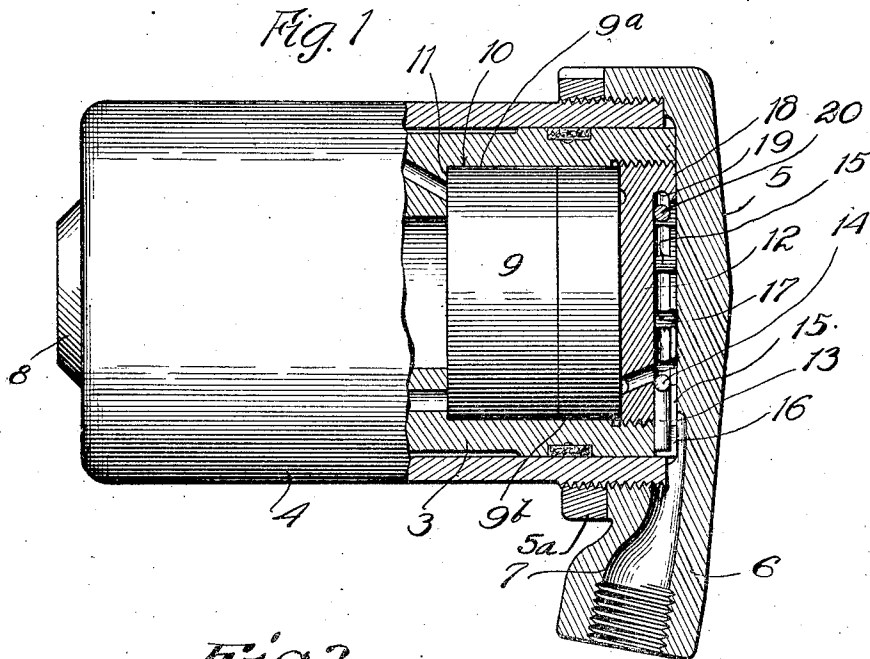
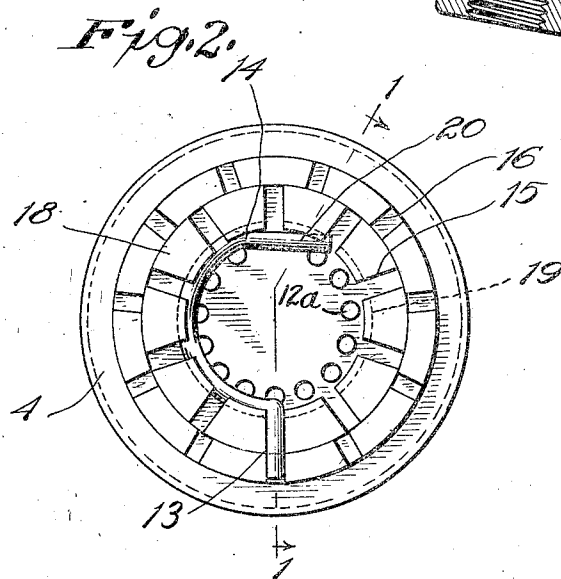
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E. H. SHAFF

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PRESSURE FLUID ACTUATED TOOL

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Inventor
Ernest H. Shaff
By Miller Chindahl & Parker
Attys

UNITED STATES PATENT OFFICE.

ERNEST H. SHAFF, OF GRAND HAVEN, MICHIGAN, ASSIGNOR TO WILLIAM H. KELLER, INC., OF GRAND HAVEN, MICHIGAN, A CORPORATION OF MICHIGAN.

PRESSURE-FLUID-ACTUATED TOOL.

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The invention has reference in general to pressure-fluid-actuated tools such, for example, as the tool of this general class commonly known as a jamb riveter.

5 The object of the invention is to provide an effective locking means of simplified construction for ensuring that the end plug of the cylinder of such a tool shall not work loose or become displaced through accident. 10 In the accompanying drawings, I have illustrated my invention as applied to a jamb riveter, but it will be understood that the invention is not limited to this particular application, and I desire to have it understood that in the interpretation of the 15 appended claims they should not be limited to the details of construction and arrangement set forth except as may be necessitated by the state of the prior art.

20 Figure 1 of the drawings is a view of a jamb riveter embodying my invention, the rear end portion being shown in section, approximately on the line 1—1 of Fig. 2. Fig. 2 is a rear end view of the tool with a 25 portion thereof removed so that the end plug and its locking device is shown in elevation.

The tool herein shown comprises generally a cylinder 3 enclosed within a housing 4 and reciprocable therein. The latter has 30 its rear end closed by means of a cap 5 threaded onto the rear end of the housing and provided preferably with a lock nut 5^a as shown. Said cap has a tubular stem portion 6 providing a passageway 7 for the motive fluid employed by the tool. The cylinder 35 is provided with the usual piston (not shown) operable into and out of engagement with the rivet set 8 or other tool suitably mounted in the forward end of the cylinder.

40 Within the rear end of the cylinder 3 is inserted valve means of suitable construction for controlling the piston of the tool. Said means includes a casing 9 composed of two annular members 9^a and 9^b inserted 45 end to end into an enlarged bore 10 provided in the rear end of the cylinder. Said bore forms an annular shoulder 11 with which the forward end of the casing is arranged to abut, and the casing is closed 50 and held in position by means of an end plug 12 screw-threaded into the rear end of the cylinder. The plug 12 has ports 12^a therethrough, as shown, to provide commu-

nication between the valve casing 9 and the fluid passageway 7. 55

Locking means are provided for said plug, comprising a device embodying a pin 13 60 formed integral with an arcuate spring clip 14 and adapted to operatively engage with the plug 12 and the rear end of the cylinder to prevent relative rotation therebetween and hence the unscrewing of the plug. 65

In order that said locking device may thus operatively engage the plug and cylinder, the latter are milled radially to provide 70 series of radial apertures in the form of grooves 15 and 16 adapted to register with each other but so arranged that only one pair of grooves of the respective sets will register at a time. To accomplish this purpose the grooves of the respective sets are 75 variously spaced apart, the grooves 15 in the plug being herein shown as having a smaller interval between them than the grooves 16 in the cylinder.

The arcuate spring clip 14 of the locking device serves to retain the pin 13 in position 80 in the registering pair of grooves. For the reception of said clip the plug is provided in its rear face with a central cavity 17. The latter leaves an annular wall in which the grooves 15 are milled, providing a circular 85 series of spaced turrets 18. This wall has formed in it an inner peripheral groove 19 in which a peripheral portion of the clip is adapted to enter. By this construction the clip serves yieldingly to hold the pin 13 against dislodgment. 90

To facilitate the removal of the locking device, the free end portion 20 of the clip is 95 shaped as by being made straight so as to lie partially within the confines of the circle of turrets 18 and thus permit of the insertion of a tool between the portion 20 and the inner face of a turret, by means of which the clip may be readily removed from its engagement in the peripheral groove 19. 100

It will be seen that I have provided an extremely simple and efficient locking device for the end plug of a tool cylinder. By 105 reason of the differential spacing of the sets of grooves 15 and 16 with reference to each other, the pin may be placed in locking position by a relatively slight adjustment of the plug to cause one of its grooves to register with a groove in the rear end of the cyl-

inder. Moreover, while the locking device may be readily removed to permit of the inspection of the interior of the cylinder or of the valve mechanism, it is not likely to become accidentally dislodged.

I claim as my invention:

1. In a tool of the class described, the combination of a cylinder having a plurality of radial apertures in its rear end equidistantly spaced apart, a plug screw-threaded into the rear end of the cylinder and having a plurality of radial apertures equidistantly spaced apart, the spaces between the apertures in the cylinder and in the plug being of different lengths, a locking clip having an arcuate portion operatively associated with one of said parts and having a radially extending portion constituting a pin adapted to be entered into registering apertures in the plug and the cylinder to prevent relative rotation between them, and a cap wholly enclosing the rear end of the cylinder and said clip.

2. In a tool of the class described, the combination of a cylinder having a plurality of radial grooves in its rear end, a plug screw-threaded into the rear end of the cylinder and also having a plurality of radial grooves therein, certain of the grooves in the cylinder and in the plug being adapted to register when the plug is entered into the cylinder, said plug having a central cavity in its outer face and an undercut groove formed at the peripheral edge of the cavity into which the grooves in the plug

open, and a locking clip comprising an arcuate portion entered into and yieldably held in said undercut groove, said clip having a radially extending portion constituting a locking pin adapted to enter said registering grooves in the cylinder and plug whereby to lock these parts against relative rotation.

3. In a tool of the class described, the combination of a cylinder having a plurality of radial grooves in its rear end, a plug screw-threaded into the rear end of the cylinder and also having a plurality of radial grooves therein, certain of the grooves in the cylinder and in the plug being adapted to register when the plug is entered into the cylinder, said plug having a central cavity in its outer face and an undercut groove formed at the peripheral edge of the cavity into which the grooves in the plug open, and a locking clip comprising an arcuate portion entered into and yieldably held in said undercut groove, said clip having a radially extending portion constituting a locking pin adapted to enter said registering grooves in the cylinder and plug whereby to lock these parts against relative rotation, said clip also having a portion offset inwardly from the peripheral edge of the cavity whereby to permit the insertion of a tool between the clip and the plug to facilitate the removal of the clip.

In testimony whereof, I have hereunto set my hand.

ERNEST H. SHAFF.