

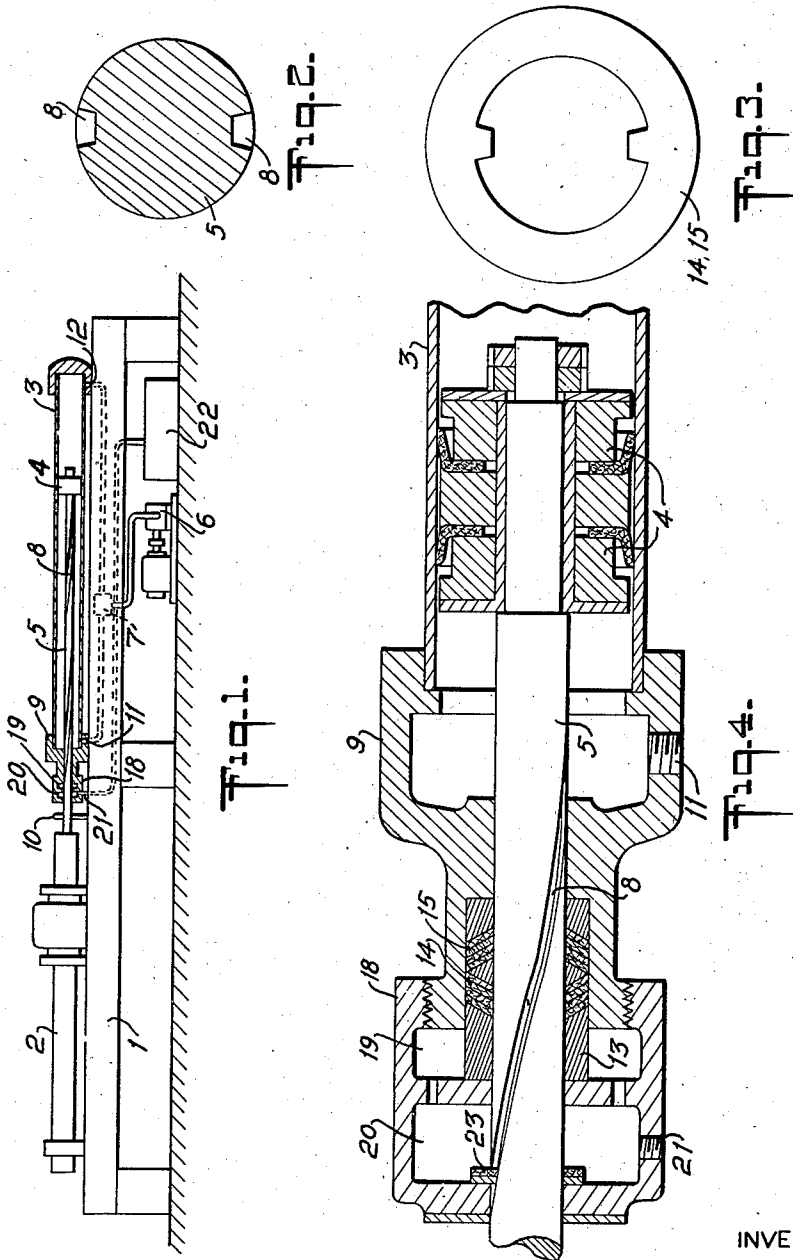
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RIFLING MACHINE

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RIFLING MACHINE

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The present invention relates to a rifling machine for shaping the internal surfaces of barrels for projectile propelling apparatus and more particularly to machines for rifling barrels the groove bore of which is constant or tapered.

In the rifling machines hitherto known the movement of the cutter has been produced by combining a rotary movement with a translatory movement. The cutter box is fixedly secured to a drawing rod which is adapted to be moved in axial direction e. g. by hydraulic means and which rod supports a spur wheel with which it must rotate. This spur wheel gears with a slidable rack which is movable in a direction perpendicular to the drawing rod. The end of the said rack is guided by the walls of a slot in an adjustable rifling twist regulating arm. These known machines have the drawback that there is considerable play in the various parts which are necessary to produce the rifling grooves, impairing thereby the accuracy. The regulating arm usually extended in lateral direction or above or below the rifling machine thereby preventing an easy handling of the barrels to be worked on the machine. This is especially the case with machines for treating guns or rifles of great length.

One object of the present invention is to provide a machine that is constructed in such a manner as to facilitate the handling of the rifle or barrel to be machined and to improve the accuracy thereof.

This object is attained by disposing about the same axis as the barrel to be machined in a drawing rod bearing a cutter head and provided with a groove corresponding exactly to the twist of the rifling grooves and by providing a guide pin which is fixedly secured to the machine and cooperates with the said groove. The drawing rod is adapted to move in longitudinal direction by hydraulic or mechanic means whereas its rotation is caused by the guide pin gliding in the groove of the rod.

The necessary movement of the drawing bar is preferably produced by a hydraulic driving. The cylinder containing the hydraulic medium, the drawing rod and the cutter box or cutter head are therefore disposed about the same axis as the rifle or barrel to be worked.

This arrangement necessitates an accurate packing system between drawing bar and cylinder. One further object of this invention is therefore to provide an accurate packing and means to return into the cylinder hydraulic pressure

liquid which has passed through the packing. The advantages consisting in a stepless regulating of the velocity of the translatory movement of the drawing bar afforded by the hydraulic driving mechanism are increased by the said construction.

The machine according to this invention can be used to produce rifling grooves of a constant or of a progressive twist. The main advantage secured by the machine according to this invention is, that the drawing bar acts exactly in the direction of the axis of the barrel to be worked. As there are no intermediate means between drawing bar and the means producing its translatory and rotary movement a very great accuracy is obtained. The machine is smaller than those in use.

In order that the invention may be clearly understood and readily carried into practice, I have appended hereto one sheet of drawing, illustrating the same, wherein:

Fig. 1 is a diagrammatic view of the hydraulic rifling machine constructed according to this invention,

Fig. 2 is a cross-section of the drawing rod,

Fig. 3 shows a packing element,

Fig. 4 shows in longitudinal section, one end of the cylinder with a part of the drawing rod and piston and packing system.

The rifling machine illustrated in the drawing comprises a bed 1 (Figures 1 to 4) supporting a barrel 2 and a hydraulic pressure cylinder 3 arranged about the same axis as the barrel 2. In the cylinder 3 moves a piston 4 connected to the drawing bar 5. The pressure medium is fed to the cylinder 3 by a pump 6. A valve 7 controls the direction of flow of the pressure medium. Drawing rod 5 is provided with a twisted groove 8, the twist of which corresponds to the rifling twist to be produced in the barrel 2. At the end of the cylinder 3 a packing system 9 is arranged. The openings 11 and 12 are the inlet and outlet openings for the pressure medium. The container of the latter bears the reference 22.

A guide pin 10 is fixedly secured to the machine bed 1. Pin 10 corresponds exactly to the cross section of groove 8. When the drawing bar is moved in axial direction the guide pin 10 forces the bar 5 to rotate about its own axis.

The packing system 9 shown in Figure 4 is fixedly secured to the cylinder 3. Several packing elements 14 and 15 are placed in the box 13. The elements 14 and 15 have the shape shown in Figure 3. They are provided with projections

entering the groove 8 and corresponding exactly to the cross section of the said groove. Cap 18 is screwed on bearing 9 and presses the box 13 with the packing elements 14 and 15 against bearing 9. Cap 18 contains two chambers 19 and 20 which collect pressure medium passing through the packing and convey the same through opening 21 back to the container 22. A further packing element 23 prevents pressure medium from leaving chamber 20.

The cutters used in connection with the machine above described may be of any known type.

The characteristic feature of the construction above described is, that the axis of the barrel which is to be provided with rifling grooves and the axis of the spindle producing the movement of the cutter head fall in the same line. Thereby precision is greatly increased. The machine described may be used to provide even very long barrels with rifling grooves of constant or of progressive twist.

What I claim is:

1. In a gun barrel rifling machine, the combination of a drawing bar provided with a helical groove corresponding to the twist of the rifles to be produced, means on said bar and coaxial therewith for imparting axial movement thereto,

a packing member for the drawing bar supported by said means, and a stationary element interposed between the packing member and the barrel to be rifled and engaging the helical groove on the drawing bar adapted to impart rotary movement to the drawing bar while it is being axially moved.

2. In a gun barrel rifling machine, the combination of a drawing bar provided with a helical groove corresponding to the twist of the rifles to be produced, a pressure fluid cylinder coaxial with the bar a piston movable in the cylinder and connected with the bar, the front end of said cylinder being relatively close to the end of the barrel to be entered by the drawing bar, a stationary element interposed between said cylinder and the barrel in the relatively narrow space between them in engagement with the helical groove of the drawing bar and adapted to impart rotary movement to the drawing bar while it is being axially moved, a packing member for the drawing bar supported by the cylinder, chambers between the packing member and the stationary element adapted to receive hydraulic pressure fluid which passed through the packing member, and a conduit for carrying off said last mentioned pressure fluid.

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