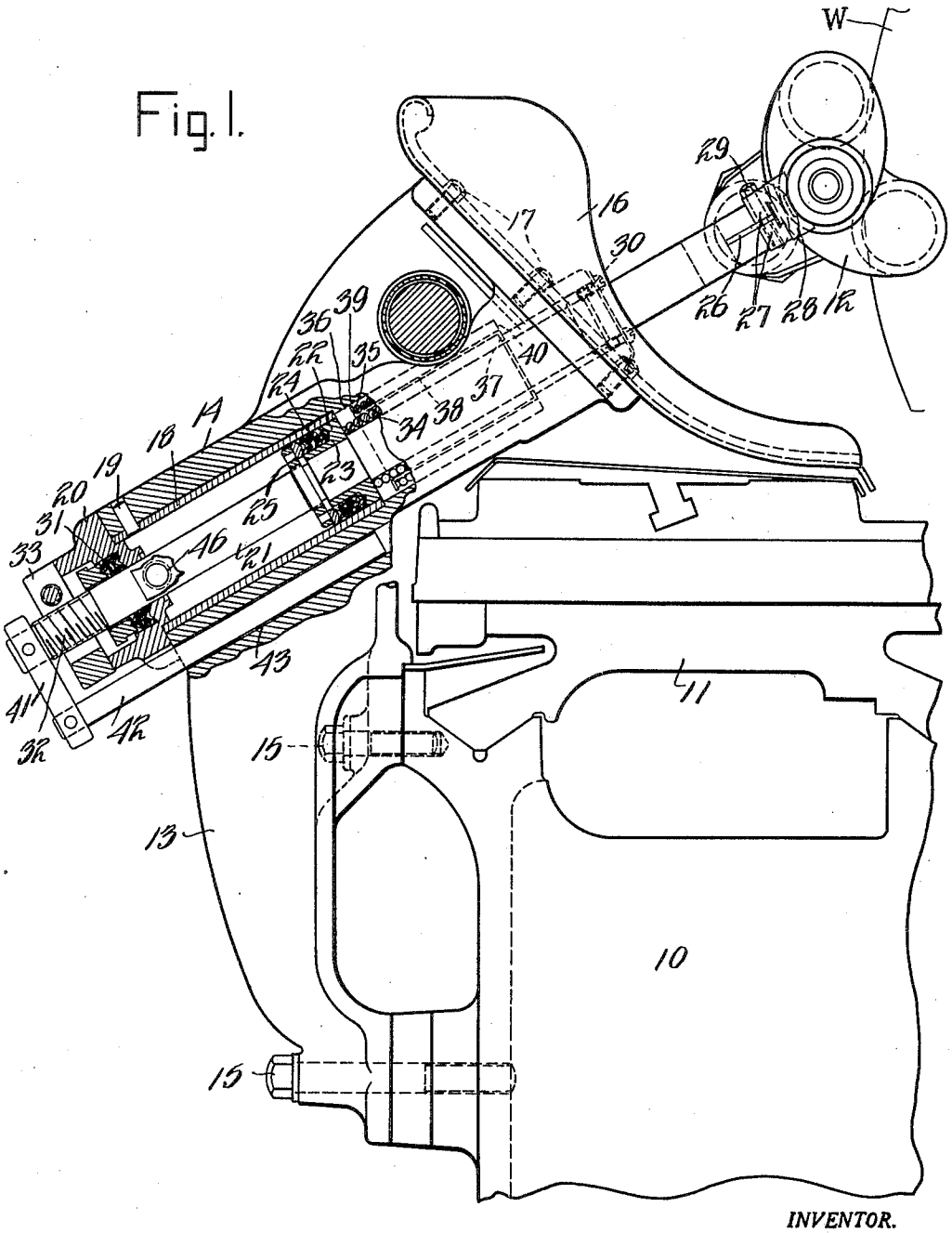
May 21, 1929. A. P. STEINER 1,713,722

HYDRAULIC BACK REST FOR GRINDING MACHINES

Filed July 29, 1926 3 Sheets-Sheet 1

Fig. 1.



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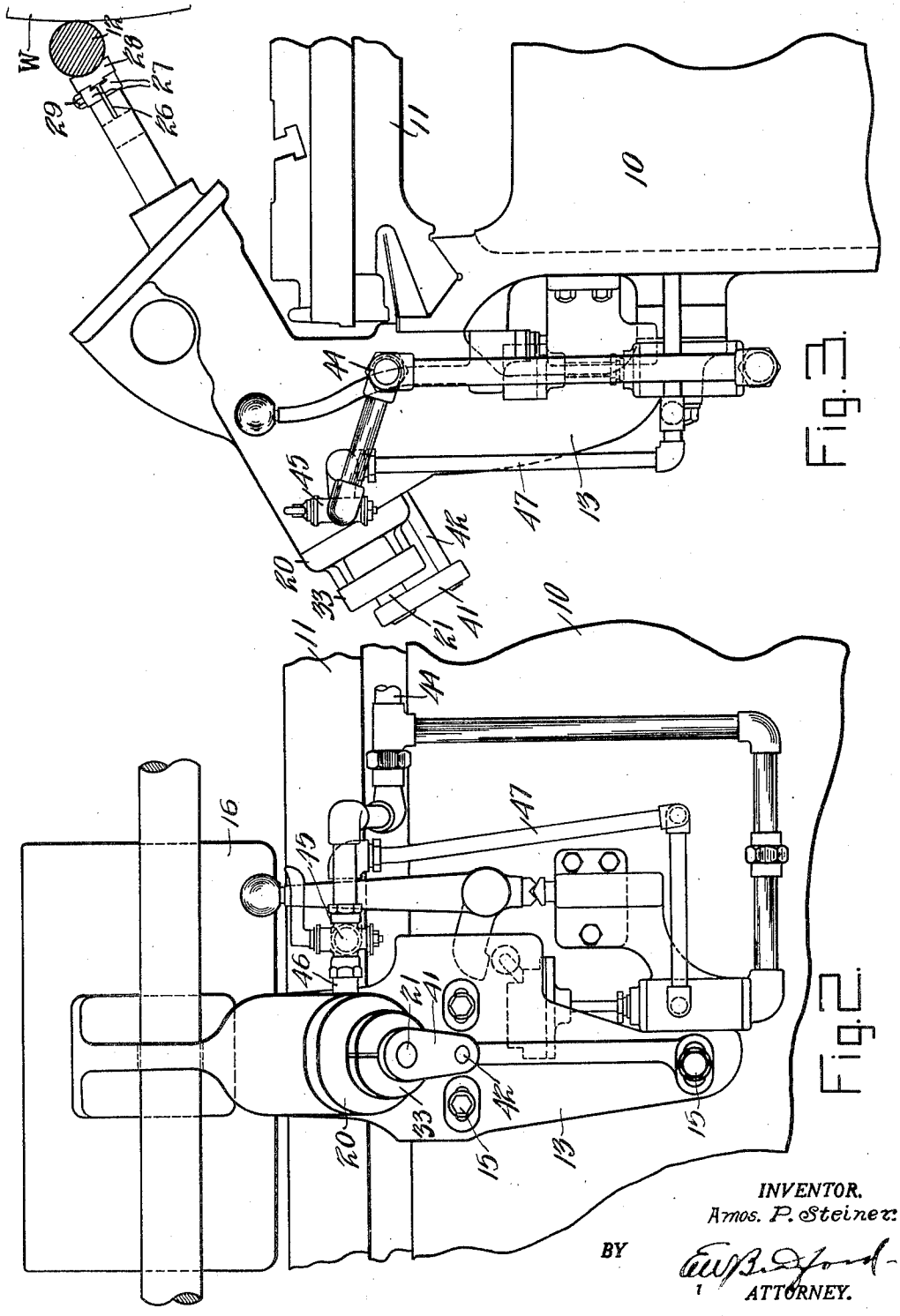


Fig. 3

Fig. 2

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HYDRAULIC BACK REST FOR GRINDING MACHINES

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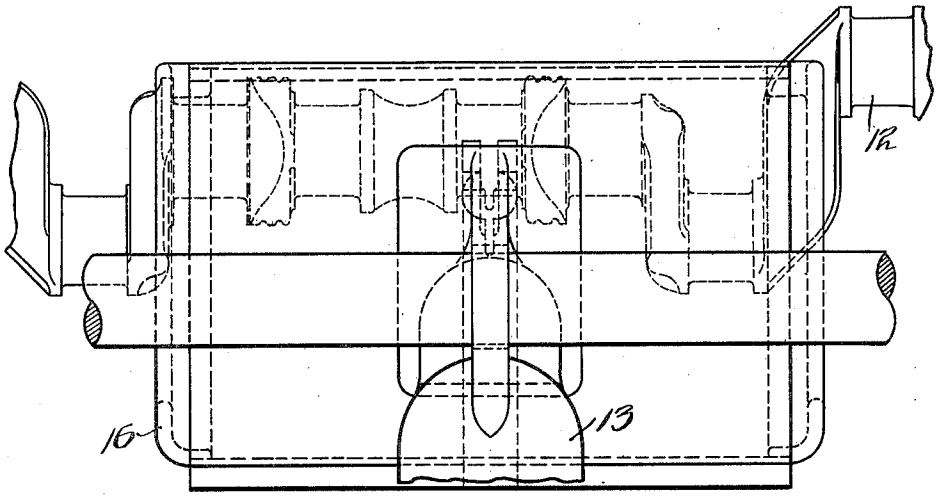


Fig. 4.

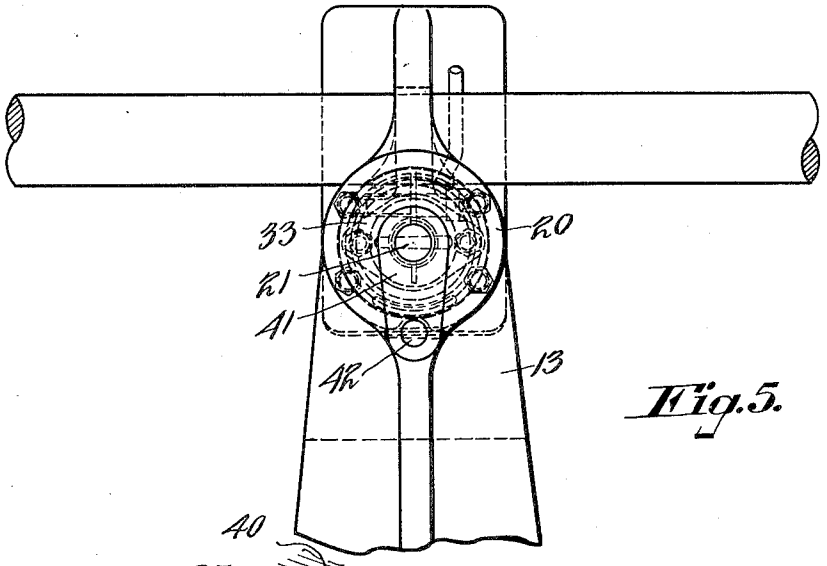


Fig. 5.

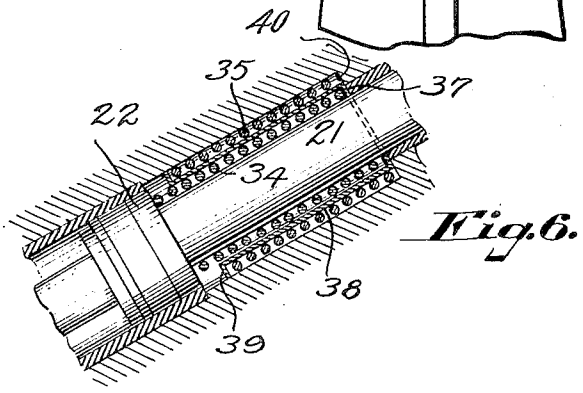


Fig. 6.

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UNITED STATES PATENT OFFICE.

AMOS P. STEINER, OF WAYNESBORO, PENNSYLVANIA, ASSIGNOR TO LANDIS TOOL COMPANY, OF WAYNESBORO, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

HYDRAULIC BACK REST FOR GRINDING MACHINES.

Application filed July 29, 1926. Serial No. 125,782.

My said invention relates to a hydraulic back-rest for use on a machine for turning or grinding shafting particularly automobile crank shafts and it is an object of the same to provide means whereby the skill and attention formerly required of an operator to keep the shaft properly supported with the hand operated back-rest is transferred to this mechanism which performs the same operation hydraulically.

A further object is to provide means whereby the bearing block of the device can be withdrawn to a position outside the path of rotation of any part of a crank shaft.

A further object is to provide means for adjusting the movement of the bearing block in order to take up wear on said block or to provide for shafts or different diameters.

A further object is to provide means to prevent rotation of the piston and hence of the bearing block about the axis of said piston.

A further object is to provide means whereby the bearing block may be replaced to fit shafts of different diameters.

Referring to the accompanying drawings which are made a part hereof and on which similar reference characters indicate similar parts,

Figure 1 is an end elevation of the device with the cylinder in section,

Figure 2, a front elevation thereof,

Figure 3, an end elevation similar to Figure 1 but showing the piping connections,

Figure 4, a front elevation showing the water guard in place and a crank shaft in position for grinding, and

Figure 5, a front elevation on a plane perpendicular to the axis of the cylinder.

Figure 6 is a detail sectional view of the cylinder piston and retracting spring.

In the drawing, the numeral 10 denotes the bed or base of a cylindrical grinding machine, 11 is the carriage, 12 the work, which, as illustrated in this instance is a crank shaft, and W the grinding wheel. The back-rest comprises a casting 13 having formed therein a cylinder 14. The lower end of the casting 13 is secured to the bed 10 by bolts 15 while the upper end is flanged to support a water guard 16 secured thereto by bolts 17.

The cylinder 14 is lined with a bushing 18 held from displacement by a pin 19 and closed at the outer end by a head 20. A piston rod 21 passes through the cylinder and beyond both ends thereof and has fixed thereto a piston 22 provided with a groove 23 adapted to receive packing 24 held under pressure by means of a washer and nut 25 to prevent any leakage of the pressure fluid past said piston. The inner end of the rod 21 is slotted as at 26 and provided with dove-tailed jaws 27 adapted to receive the dove-tailed end of a bearing block 28 secured therein by a bolt 29 which passes through the jaws 27. In order to prevent any water from entering the piston chamber, a packing box 30 is provided where the rod 21 enters the casting 13. The outer end of the rod 21 passes through a packing box 31 in the head 20 and is threaded at 32 to receive a calibrated adjusting nut 33 which is used to adjust the rod 21 to compensate for any wear on the bearing block 28 or to vary the inward movement of the rod 21 to provide for different sizes of work. In Figure 1, of the drawings, the piston is shown in its working position or under pressure of the pressure fluid. When the pressure fluid is shut off, the piston and its associated parts are moved away from the work by means of springs 34 and 35 mounted in a chamber 36 communicating with the cylinder 14. The spring 34 bears at one end against the piston 22 and at the other end against an inturned flange 37 of a sleeve 38 which surrounds said spring and which has an out-turned flange 39 at its opposite end against which one end of the spring 35 bears. The other end of spring 35 rests against a shoulder 40 formed by the end of the chamber 36. With this arrangement of springs, the piston is moved twice the distance attainable with a single spring of the same length.

In order to prevent rotation of the piston rod 21 on its axis, an arm 41 is keyed to the outer end thereof with its opposite end keyed to a shaft 42 slidably mounted in a bore 43 in the casting 13 and parallel with the rod 21.

Fluid under pressure is conducted from a pipe 44 through a three-way valve 45 and short pipe 46 to the cylinder 14 for operating the piston 22 and forcing the block 28 against the work. When it is desired to withdraw the block 28 from the work, the valve 45 is

turned to allow the fluid to escape through an exhaust pipe 47 under pressure of the springs 34 and 35.

With a hydraulic back-rest of this type, a more uniform pressure is exerted against the work and the operator may devote his time to other operations since the position of the bearing block is adjusted automatically by the pressure as the diameter of the work is reduced.

It will be obvious to those skilled in the art that various changes may be made in my device without departing from the spirit of the invention and therefore I do not limit myself to what is shown in the drawings and described in the specification but only as indicated in the appended claims.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent, is:

1. A hydraulic back-rest of the class described comprising a bracket, a cylinder constructed integral therewith, a piston and piston rod in said cylinder, a bearing block on the end of said rod, fluid-pressure means to force said piston and block in one direction, and resilient mechanical means for retracting said block, substantially as set forth.

2. A hydraulic back-rest of the class described comprising a bracket, a cylinder constructed integral therewith, a piston and piston rod in said cylinder, a bearing block on the end of said rod, and means to prevent rotation of said rod comprising an arm fixed at one end to said piston rod, a short rod fixed to the other end of said arm and a passage in said bracket parallel to said piston rod to receive said short rod, substantially as set forth.

3. A hydraulic back-rest of the class described comprising a bracket, a cylinder associated therewith, a piston and piston rod in said cylinder, a bearing block on the end of said rod, fluid-pressure means to force said piston and block in one direction, and mechanical means to force said piston and block in the other direction comprising a spring encircling said piston rod and bearing at one end against said piston, a sleeve encircling said spring, an inwardly extending flange on one end of said sleeve supporting the other end of said spring, an outwardly extending flange on the opposite end of said sleeve, and a second spring bearing against said outwardly extending flange and said bracket, substantially as set forth.

4. A hydraulic back-rest of the class described comprising a bracket rigidly attached to a stationary part of the grinding machine, a cylinder constructed integral with the bracket, a piston and a piston rod in said cylinder, a bearing block on the end of said rod, means for admitting pressure fluid to one end of said cylinder, to move the piston in the direction of the work, and resilient means for withdrawing the piston from the work, substantially as set forth.

In witness whereof, I have hereunto set my hand at Waynesboro, Pennsylvania this 26th day of July, A. D. nineteen hundred and twenty-six.

AMOS P. STEINER.