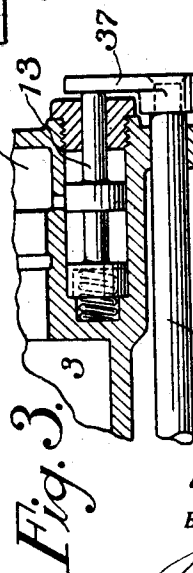
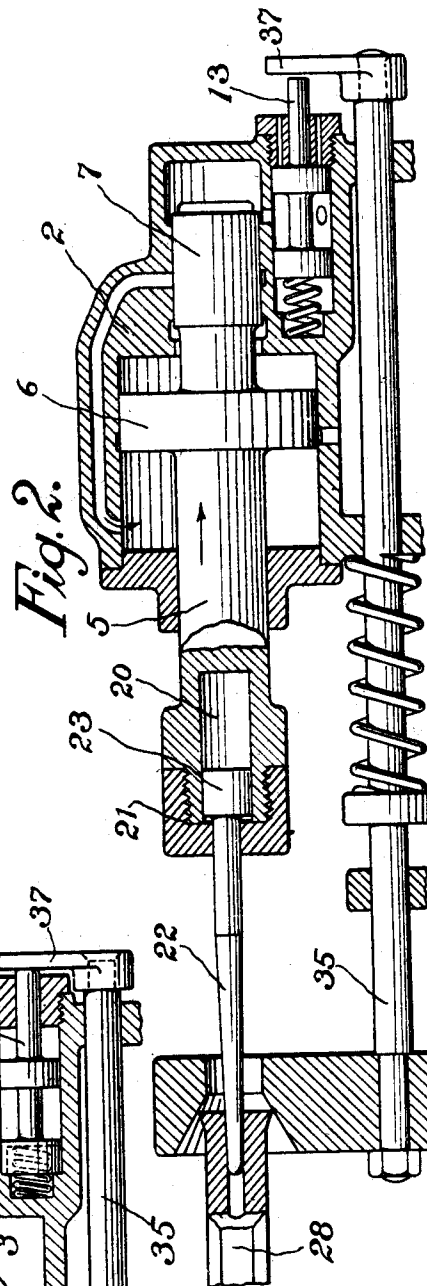
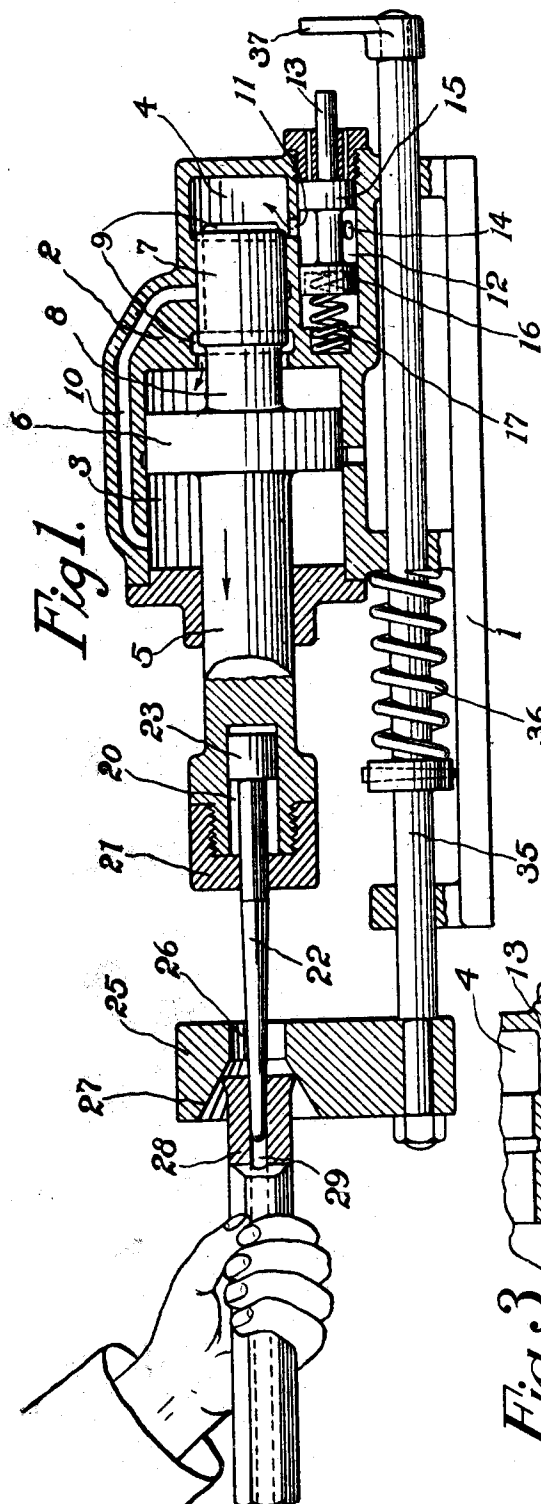


W. A. SMITH.
PINNING OUT MACHINE FOR DRILL STEELS.
APPLICATION FILED JULY 14, 1919.

1,379,225.

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PINNING-OUT MACHINE FOR DRILL-STEELS.

1,379,225.

Specification of Letters Patent.

Patented May 24, 1921.

Application filed July 14, 1919. Serial No. 310,750.

To all whom it may concern:

Be it known that I, WILLIAM A. SMITH, a citizen of the United States, residing at Easton, in the county of Northampton and State of Pennsylvania, have invented a certain new and useful Improvement in Pinning-Out Machines for Drill-Steels, of which the following is a specification.

This invention relates to a machine for pinning out or opening up the central hole with which a drill steel is usually provided after the cutting edges of the drill steel have been formed or resharpened.

The object of the present invention is to provide a pinning out machine for drill steels which will be simple, compact and one that will operate to open or clear the central hole of the drill steel rapidly and efficiently.

Another object of the invention is to provide a machine of the above type which may be readily applied to a drill sharpening machine or which may be readily mounted upon a bench or other convenient support.

A further object of the invention is to provide a pinning out machine which may be operated entirely by fluid pressure, the fluid rapidly reciprocating a hammer having a pin suitably mounted in its forward end so that the pin will be struck repeatedly by the reciprocating hammer or piston and thus be driven into the drill steel.

A further object of the invention is to provide automatic means for starting and stopping the operation of the hammer when a drill steel is held in its position to be operated upon by the pin.

With these and other objects in view my invention consists in the features of construction and operation set forth in the following specifications.

In the drawings annexed hereto and forming a part of the specification:

Figure 1 shows a longitudinal view of a device made in accordance with the present invention, with a drill steel in position to be operated upon.

Fig. 2, a view similar to Fig. 1 with the drill steel in another operative position relative to the cylinder.

Fig. 3, a fragmentary view of the device with the operating valve in closed position.

Referring more particularly to the drawings, 1 refers to a base member which may be mounted upon any convenient support

and is provided at its rear portion with a cylinder 2 of any convenient form, which may be integral with the base member 1 or attached thereto. The cylinder selected for illustration in the present embodiments of the invention is of the differential or two diameter type, the larger diameter being shown at 3 and the smaller diameter at 4. Within bores 3 and 4 of the cylinder 2 reciprocates a hammer 5 having a piston 6 fitting the larger bore 3 and a shank 7 fitting the smaller bore 4. Between the piston 6 and the shank 7 is a reduced neck portion 8 adapted to open communication between the forward end of a supply port 9 and the rear end of bore 3 when the hammer is in the position shown in Figs. 1 and 2. A passage or conduit 10 is provided to convey fluid to the forward end of the bore 3 when the piston is at the forward extremity of its travel. Constant pressure is maintained within the rear portion of the smaller bore 4 which may be suitably counterbored by means of port 11 which opens into a valve chamber 12 in which operates a valve 13. Pressure is supplied to the valve chamber 12 through a suitable inlet 14 in connection with any suitable supply of fluid such as compressed air.

The valve 13 which is of the spool type is provided with two heads 15 and 16, the head 15 opening and closing communication between the supply 14 and the admission passage 11, and the head 16 serving to balance the valve to prevent an end thrust in one direction. A comparatively light spring 17 presses against head 16 of the valve and tends to hold the valve in open position as shown in Figs. 1 and 2.

The forward end of the hammer is suitably bored for a short distance as shown at 20 and the forward end is closed by a cap 21 suitably fastened by any well known means to the extreme forward end of the hammer 5. Within the bore 20 is located a pin 22 having a head 23 at its extreme rearward end adapted to slide within the bore 20, the forward end of pin 22 extending through a suitable hole provided in the cap 21.

In advance of the pin 22 and slidably mounted to move toward and away from the hammer 5 is an abutment 25 having a suitable orifice 26 to permit the passage of the pin 22 therethrough.

The forward end of the orifice 26 is suitably tapered as shown at 27 to permit a drill steel 28 to partly enter and be held centrally of the pin 22. The orifice 26 is provided in the abutment 25 in alinement with the path of movement of pin 22 so that as pin 22 is thrust forwardly it will engage and enter the central hole 29 usually provided in drill steels. The abutment 25 is mounted and supported upon one or more rods 35 slidably in the base member 1, only one rod preferably being shown in this instance parallel with the axis of the hammer 5 and serves to guide the movement of abutment 25 so that its movement is always in alinement with the axis of the hammer 5. The rod 35 is provided with a spring 36 tending to force the abutment 25 away from the pin 22 and the rear end of this rod 35 is provided with an offset piece 37 which in its extreme forward position engages a rear end of valve 13 and holds valve 13 in closed position as shown in Fig. 3.

In operating the mechanism above described and shown in Figs. 1 to 3, a drill steel 28, the central hole of which has been closed during the process of forming or resharpening the cutting edge, is heated to a suitable temperature and placed within the tapered portion 27 of the orifice 26, after which it is thrust forwardly. The pressure forwardly of the drill steel 28 overcomes the resistance of spring 36 and allows the abutment 25 to move toward the hammer 5. This movement disengages the offset piece 37 from the valve 13 permitting the valve 13 to move to open position and start operation of the hammer 5. The hammer 5 reciprocating back and forth within cylinder 2 allows the head 23 of pin 22 to be hit by the hammer, this hammering effect driving the pin 22 into the central hole 29 of drill steel 28. When the drill steel has been suitably opened by driving the pin 22 sufficiently into the drill steel 28 the drill steel 28 is forced backwardly a short distance to allow the abutment 25 to move slightly away from the hammer 5. This position of the cylinder and abutment permits the forward surface of head 23 of pin 22 to strike against the cap 21, thus hammering on pin 22 to force it out of the drill steel 28. This is clearly shown in Fig. 2. As soon as the pin 22 has been withdrawn from the drill steel 28 and the drill steel removed from abutment 25, spring 36 expands again and forces the offset piece 37 to strike against the valve 13 thus closing the valve and stopping reciprocation of the hammer 5. This position of the valve is shown in Fig. 3.

The above described embodiment represents one preferred form of the invention adapted to carry out the spirit of the invention described and claimed in the annexed claims. It is to be understood, however, that any well known form of valve mechanism may be substituted for that shown or that any well known form of hammer may be utilized to reciprocate the pin 22 within the scope of the present invention as set forth in the claims and also any form of starting and stopping device may be utilized which may be controlled if desired, independently of the movement of abutment 25.

Having thus described my invention:

What I claim is:

1. In a pinning out machine for drill steels, a cylinder and fluid operated reciprocatory hammer, a pin adapted to enter the drill steel, a support for the steel into which the pin is to be driven, and means whereby relative alining reciprocatory movement between the cylinder and the said support starts and stops the operation of the hammer.
2. In a device for driving and withdrawing a pin, a fluid operated reciprocatory hammer, a pin slidably mounted therein, a movable support for the article into which the pin is to be driven and withdrawn and means whereby the movement of said support starts and stops the operation of said hammer.
3. In a pinning out machine for drill steels, an abutment against which the drill steel is adapted to be held, a pin adapted to enter the drill steel and a fluid actuated reciprocatory hammer adapted to hammer the pin into the steel by repeated blows against the pin in one direction, and hammer the pin out of the steel by repeated blows in the opposite direction.
4. In a pinning out machine for drill steels, a pin mounted to slide within the forward end of a fluid operated hammer, an abutment against which the drill steel is adapted to be placed and through which the pin is adapted to extend, and means controlled by movement of said abutment to start and stop the reciprocations of said hammer.
5. In a pinning out machine for drill steels, means for holding the drill steel, a pin adapted to enter the drill steel and a fluid actuated reciprocatory hammer adapted to hammer the pin into the steel by repeated blows against the pin in one direction, and hammer the pin out of the steel by repeated blows in the opposite direction.

In testimony whereof I have hereunto set my hand.

WILLIAM A. SMITH.