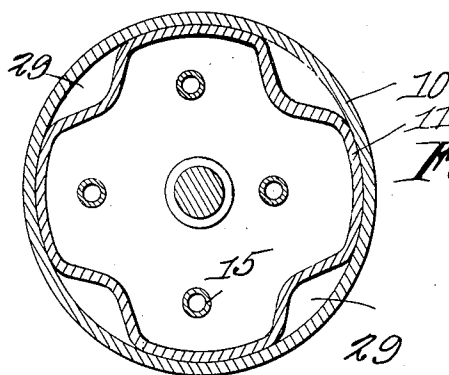
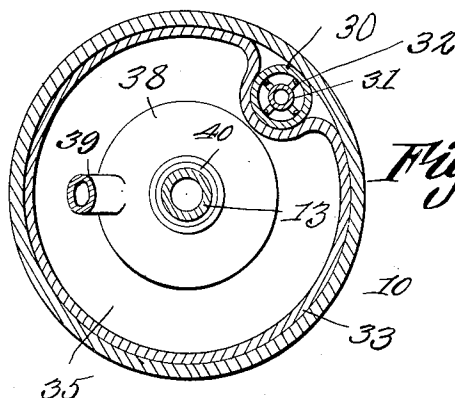
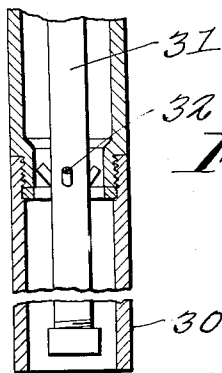
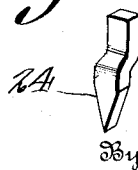


WELL DRILL.

Patented Dec. 10, 1918.

1,287,477.



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WELL-DRILL.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE W. SIMPSON, a citizen of the United States of America, and resident of Stroud, in the county of Lincoln and State of Oklahoma, have invented certain new and useful Improvements in Well-Drills, of which the following is a specification.

This invention relates to well drills and particularly to pneumatically operated well drills having novel means whereby the drills may be caused to operate outside of the zone or area to be occupied by the casing so that the drills create a clearance to permit the casing to settle as the cutting operation is carried on.

A further object of this invention is to provide a casing having drill operating mechanism, which drill operating mechanism may be readily removed upon completion of the drilling operation.

A still further object of this invention is to provide oscillatory or laterally movable drill cylinders with means for supplying air or pressure to the casings notwithstanding they have the oscillatory movement mentioned.

A still further object of this invention is to provide novel means for rotating the drills while they are being reciprocated, and furthermore to provide novel means for removing cuttings which have been dislodged by the drills.

With the foregoing and other objects in view, the invention consists in the details of construction, and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail, reference will be had to the accompanying drawings forming part of this specification, wherein like characters denote corresponding parts in the several views, and in which—

Figure 1 illustrates a vertical sectional view of a casing with the drilling apparatus applied thereto;

Fig. 2 illustrates a section on the line 2—2 of Fig. 1;

Fig. 3 illustrates a section on the line 3—3 of Fig. 1; and

Fig. 4 illustrates a sectional view of the discharge chute with a blower contained therein.

Fig. 5 is a perspective view of the wedge.

In these drawings 10 denotes any well casing which has a movable chamber 11 therein with a cover 12 through which a pressure supplying pipe 13 extends and by the term pressure supplying pipe, I mean any air pipe or conduit for the supply of the drill operating fluids regardless of their nature.

The pressure supplying pipe 13 has a head 14 with a plurality of branches to which preferably flexible members or tubes 15 are connected and the tubes in turn are each in communication with a drill cylinder 16 in which or in relation to which the drill 17 is reciprocated. The chamber 11 has a number of partitions such as 18, 19 and 20 through which the cylinders extend and in which they are movable, and the cylinders have apertures of such size as to afford clearance for the movement of the cylinders and drills laterally. The drills each have a shoulder 21 and a spring 22 encircles the drill between the shoulder and the partition 20 for holding the drill normally elevated, and a spring 23 bears against the side of the cylinder to tilt it laterally so that the drill projects beyond the line of the exterior wall of the lining or casing 11. When it is desirable to insert a casing before the drills are to be operated, they are held in a vertical position by a wedge 24 which is inserted in an aperture of the partition 20 so as to engage the drill and hold it from lateral movement, but such wedge is dislodged upon operation of the drill since its reciprocal action carries the wedge out of the aperture, and the spring 23 then exercises its function of tilting the cylinder and causing the drill to assume the position shown in Fig. 1.

The wall of the chamber 11 is of irregular configuration, so that when it is applied to the well casing a number of channels 29 are

formed through which cuttings will find their way to the top of the chamber, and at that point the discharge chute 30 terminates, the said discharge chute extending to the
 5 top of the casing and the cuttings being discharged therefrom by air pressure issuing from the pipe 31 through the jets 32 which jets have an upward inclination so that the current of air is deflected on the top of the
 10 casing.

The casing 10 also contains drill rotating means which in the present embodiment of the invention consists of a housing 33 with an end 34 and partition 35 and a closure
 15 for the upper end, which includes a stuffing box 36, which stuffing box constitutes a coupling between the air duct 37 and the pressure supply pipe 13, the said pressure supplying pipe constituting what may be termed
 20 a hollow shaft rotatable in the stuffing box and operating to turn the housing or chamber containing the drilling mechanism.

As a means for rotating the pressure supplying pipe, I employ a pressure operated
 25 motor 38 consisting in a casing and a rotary member therein having a source of pressure supply through the tube 39 which communicates with the air duct 37 and a rotary member is connected to rotate a sleeve 40 on the
 30 pressure supplying pipe. The sleeve has gear teeth 41 near its lower end and these gear teeth are engaged by pinions 42 mounted on shafts 43, there being a plurality of pinions and shafts and they being of the
 35 same construction, they need not be separately described. The shafts 43 have pinions 44 mounted on them so as to rotate with them and the said pinions mesh with gear teeth 45 which are formed on the outer sur-
 40 face of the pressure supply pipe so that through the gearing just described, the motor serves as a means for rotating the said pressure supply pipe, and hence the drill cylinders are turned as the motor is driven.
 45 The motor casing 38 is shown as anchored on the partition 35 and the lower end of the motor casing serves as journal bearings for the shafts 43.

The construction and operation will, it is
 50 thought, be understood from the foregoing description since the pressure derived from the air duct is supplied to the motor and the motor rotates the pressure supply pipe, which is of a rigid hollow nature and
 55 through which pressure is supplied for operating the drills, and after the well casing has reached the depth intended, all of the operating mechanism for the drills will be removed from the casing in the usual man-
 60 ner.

I claim—

1. In a well drill, a chamber adapted to be applied to a well casing, said chamber having apertured partitions therein, drilling

mechanism in the said partitions and adapt- 65
 ed to oscillate therein, means for holding the mechanism against oscillation prior to the operation of the drilling mechanism, and means for supplying pressure to the said
 70 drilling mechanism.

2. In a well drill, a chamber adapted to be applied to a well casing, said chamber having apertured partitions therein, drilling mechanism in the said partitions and adapt- 75
 ed to oscillate therein, means for holding the mechanism against oscillation prior to the operation of the drilling mechanism, means for supplying pressure to the said drilling mechanism, and means for rotating the pres-
 80 sure supplying means and communicating rotary motion to the drilling mechanism.

3. In a well drill, a housing having apertured partitions therein, drilling mechanism extending through the apertures of the par-
 85 titions and oscillatably mounted therein, means for pressing the drilling mechanism laterally of the housing, means for temporarily holding the drilling mechanism against lateral movement prior to the opera-
 90 tion of the drill, a pressure supplying pipe rotatably mounted in the housing, and means for rotating the said pressure supplying pipe.

4. In a well drill, a housing having apertured partitions therein, drilling mechanism 95
 extending through the apertures of the partitions and oscillatably mounted therein, means for pressing the drilling mechanism laterally of the housing, means for tempo-
 100 rarily holding the drilling mechanism against lateral movement prior to the operation of the drill, a pressure supplying pipe rotatably mounted in the housing, means for rotating the said pressure supplying pipe including a
 105 motor having means of communication with the pressure supply pipe, and means for coupling the motor to the pressure supply pipe.

5. In a well drill, a housing having apertured partitions therein, drilling mechanism 110
 extending through the apertures of the partitions and oscillatably mounted therein, means for pressing the drilling mechanism laterally of the housing, means for tempo-
 115 rarily holding the drilling mechanism against lateral movement prior to the operation of the drill, a pressure supplying pipe rotatably mounted in the housing, means for rotating the said pressure supplying pipe including a
 120 motor having means of communication with the pressure supply pipe, a sleeve rotated by the motor, gear driven by the said sleeve, and means for coupling the gear to the pressure supply pipe whereby it is rotated.

6. In a well drill, a chamber adapted to be applied to a well casing, said chamber hav- 125
 ing apertured partitions therein, drilling mechanism in the said partitions and adapted to oscillate therein, means for holding the

mechanism against oscillation prior to the operation of the drilling mechanism, means for supplying pressure to the drilling mechanism, a chute for the discharge of cuttings, 5 a pressure supply pipe therein, and upwardly extending nipples discharging into the chute.

7. In a well drill, a chamber adapted to be applied to a well casing, drilling mechanism in said chamber mounted to oscillate therein, 10 means for holding the mechanism against oscillation prior to the operation of the drilling mechanism, and means for supplying operating pressure to the drilling mechanism.

GEORGE W. SIMPSON.