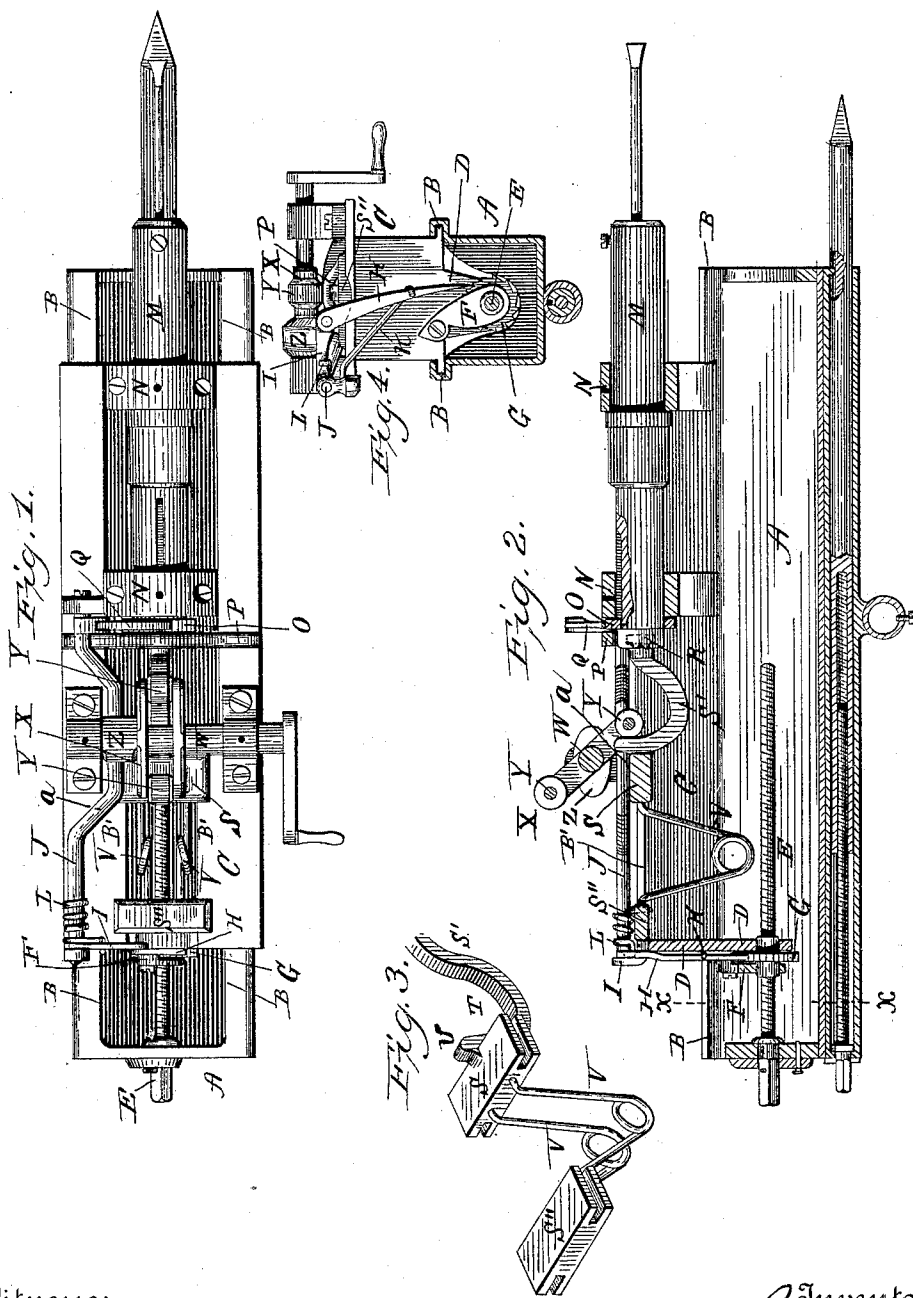


(No Model.)

A. RENETZKY.
DRILLING MACHINE.

No. 460,401.

Patented Sept. 29, 1891.



Witnesses

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UNITED STATES PATENT OFFICE.

AUGUSTUS RENETZKY, OF LINCOLN, ILLINOIS.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 460,401, dated September 29, 1891.

Application filed May 14, 1891. Serial No. 392,800. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS RENETZKY, a citizen of the United States, residing at Lincoln, in the county of Logan and State of Illinois, have invented certain new and useful Improvements in Drilling-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My present invention has reference to improvements on the drill shown in Letters Patent No. 407,688, granted to me on July 23, 1889, and relates, especially, to the mechanism for reciprocating the drill-rod and for rotating the same during its reciprocatory movement.

The invention consists in a certain peculiar construction and arrangement of parts, as will be hereinafter fully described, and then pointed out in the claims.

In the annexed drawings, which fully illustrate my invention, Figure 1 is a front elevation of my improved drill. Fig. 2 is a longitudinal section of the same; Fig. 3, a detail perspective view of a portion of the cross-head and connected springs. Fig. 4 is a rear view, partly in cross-section.

Referring particularly to the drawings, A designates the body or main frame of the drill, which is provided with the ways B, as shown in my former patent above mentioned. The body is supported in the present instance by a tripod, (not shown,) one leg of which is mounted on the rear side of the body and the other legs of which are pivoted or journaled thereto in the usual manner. Upon the ways B, I mount the carriage C, which supports the drill-rod and the mechanism for operating the same, and is provided at its upper end with the rearwardly-extending projection or bearing D, through which a screw-threaded rod E passes. A bracket F is secured on the upper side of this projection, and between the said bracket and the projection I mount a ratchet wheel or disk G, the hub of which is internally threaded and engages the threaded rod, so as to rotate thereon, and thereby feed the carriage over the ways, the threaded rod being held stationary in the upper end of the body or main frame, as will be readily understood. The ratchet-disk is engaged and operated by a pawl H, which is pivoted to the end

of a crank-arm I on the outer end of a compound crank-shaft J, which is journaled in suitable bearings on the upper side of the carriage near one edge of the same. The pawl is held in engagement with the disk by a spring K, which is secured to the carriage and engages the pawl, and the rock-shaft is held normally in such a position that the crank-arm will project transversely of the machine by a spring L, coiled around the end of the shaft, said spring having one end secured to the carriage and its other end hooked under the crank-arm.

The drill-rod or plunger M is mounted in the bearings or brackets N, which are provided on the front end of the carriage, and near the outer end of the said rod or plunger I secure the ratchet-disk O, which is loosely keyed to the drill-rod and is held thereto by a transverse arm P on the carriage, as shown. This disk is engaged by a pawl Q, pivoted to an arm and the inner crank-arm of the rock-shaft, and is thereby operated to rotate the drill-rod. The outer end of the drill-rod is provided with a socket R, which is engaged by the inner end of the sliding cross-head S, the said cross-head consisting of a T-shaped body with the ends of its head or transverse portion engaging ways on the carriage and sliding therein. The inwardly-extending portion S' of the cross-head is curved downward and then forward to the end of the drill-rod, so as to present the recess T and the shoulder U, the purpose of which will presently appear. Beyond the sliding cross-head and secured to the same and to a supplemental sliding head S'' upon the ways B' at the outer end of the carriage are a series of springs V, which force the drill-rod inward after it has been drawn out and released, the end of the cross-head being swiveled to the end of the drill-rod, (in the socket R,) so that when the cross-head is drawn out the drill-rod will be lifted, as will be readily understood.

The driving-shaft W is arranged above the sliding cross-head and is journaled transversely upon the carriage in suitable bearings thereon, as shown and as will be readily understood. At the center of the driving-shaft I provide the diametrically-opposite crank-arms X, having the rollers Y at their ends. These crank-arms are arranged directly over

the recess T in the cross-head and are adapted to engage the shoulder U, the rollers serving to reduce the friction between the parts. The driving-shaft is provided at one end with a

5 suitable handle or operating gearing, and near the opposite end thereof I provide the double cam Z, which is arranged directly over and in contact with the central crank-arm a of the compound crank or rock-shaft J.

10 The construction and arrangement of the several parts of the machine being thus made known, the operation of the same will be readily understood. The device is arranged at the point where it is desired to drill and the

15 driving-shaft put in motion. The double crank-arm thereon will thus be caused to impinge against the shoulder on the cross-head, and thereby force the same and the drill-arm outward. The continued rotation of the driving-shaft will remove the crank-arm from the

20 shoulder, and the springs beyond the cross-head will then at once throw it inward. As the driving-shaft rotates to cause the crank-arms to operate the cross-head the double cam

25 will depress the central crank-arm of the rock-shaft, and thereby cause the pawls at the ends of the same to rotate their respective ratchet-disks, so as to rotate the drill-rod and at the same time feed the same forward.

30 As the smaller portion of the cam comes over the crank-arm the spring at the upper end of the shaft will lift the same, so that the continued rotation of the cam will again depress the crank-arm and again feed the drill-rod

35 forward and rotate it.

The advantages of my improved machine are thought to be obvious. The several parts of the operating mechanism are all mounted upon the carriage in a very compact form and

40 all unnecessary parts are omitted, so that a very light machine is produced. The arrangement of the gearing is such as to accomplish the desired results with the fewest possible number of parts, and consequently permit the machine to be operated by a very light power.

45 It will be observed that the recess in the cross-head enables me to bring the shoulder very

nearly over the center of motion of the crank-arms, and consequently I utilize the entire leverage exerted by the said arms, thus giving 50 a very powerful blow with the drill. The arrangement of the parts for rotating the drill-rod is such as to reduce the weight of the machine and to permit ready access to the same for the purpose of changing the drill-rod or of 55 cleaning or repairing the same.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of a carriage provided 60 with ways, a drill-rod sliding thereon, a sliding cross-head swivelly connected to said drill-rod and sliding in said ways, a supplemental cross-head sliding in said ways beyond the cross-head and abutting against the carriage, 65 springs V V, connecting the two cross-heads and having a tendency to press them apart, and a transverse shaft provided with crank-arms adapted to engage and reciprocate the cross-head, substantially as described. 70

2. The combination of a frame, a carriage sliding thereon, a sliding drill-rod on the carriage, a ratchet-wheel loosely keyed on the outer end of the drill-rod, so that it will revolve but not reciprocate with it, a cross-head 75 swiveled to the upper end of the drill-rod, a transverse operating-shaft journaled on the carriage and provided with crank-arms to reciprocate the cross-head, a cam near one end of said shaft, a compound crank-shaft journaled on the upper side of the carriage, the central crank of which extends under the cam on the transverse operating-shaft, means for normally holding said crank against said cam, and a pawl pivoted to the inner crank-arm of 80 the compound crank-shaft and engaging the ratchet-wheel on the drill-rod, substantially as described. 85

In testimony whereof I affix my signature in presence of two witnesses.

AUGUSTUS RENETZKY.

Witnesses:

URIAH HILL,
FRANK FISK.